Technological Ecologies & Sustainability

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	Dickie Selfe, Heidi McKee, and Dànielle Nicole DeVoss	Collectives, Common Worlds, and the Idea of Sustainability: An Introduction
Section I: Sustaining Instructors, Students, and Classroom Practices		
	Heidi McKee	Introduction to Section I
1	Kelli Cargile Cook, Ryan (Rylish) M. Moeller, and Cheryl E. Ball	Political Economy and Sustaining the Unstable: New Faculty and Research in English Studies
2	Kristie S. Fleckenstein, Fred Johnson, and Jackie Grutsch McKinney	A Portable Ecology: Supporting New Media Writing and Laptop-ready Pedagogy
3	Anthony T. Atkins and Colleen A. Reilly	Stifling Innovation: The Impact of Resource-poor Techno-ecologies on Student Technology Use
4	Peter J. Fadde and Patricia Sullivan	Video for the Rest of Us? Toward Sustainable Processes for Incorporating Video into Multimedia Composition
5	Kathleen Blake Yancey	Portfolios, Circulation, Ecology, and the Development of Literacy
Section II: Sustaining Writing Programs		
	Dànielle Nicole DeVoss	Introduction to Section II
6	Michael Day	The Administrator as Technorhetorician: Sustainable Technological Ecologies in Academic Programs
7	Patricia Ericsson	Sustainability and Digital Technology: Program Analysis Via a "Three-legged" Framework
8	Beth L. Brunk-Chavez and Shawn J. Miller	The Hybrid Academy: Building and Sustaining a Technological Culture of Use
9	Kip Strasma	Using the LEED Evaluation Tool to Assess the Sustainability of First-Year Computers and Writing Programs
10	Jude Edminster, Andrew Mara, and Kristine Blair	Digital Studio as Method: Collaboratively Migrating Theses and Dissertations into the Technological Ecology of English Studies
Section III: Sustaining Writing Center, Research Centers, and Community Programs		
	Dickie Selfe	Introduction to Section III
11	James E. Porter	Sustaining a Research Center: Building the Research and Outreach Profile for a Writing Program
12	Jeanne R. Smith and Jay D. Sloan	Sustaining Community and Technological Ecologies: What Writing Centers Can Teach Us
13	Mike Palmquist, Kate Kiefer, and Jill Salahub	Sustaining (and Growing) a Pedagogical Writing Environment: An Activity Theory Analysis
14	Lisa Dush	Genre-Informed Implementation Analysis: An Approach for Assessing the Sustainability of New Textual Practices
Section IV: Sustaining Scholarship and the Environment		
	Dànielle Nicole DeVoss	Introduction to Section IV
15	Lisa Lebduska	Sustainable Digital Ecologies and Considered Limits
16	Shawn Apostel and Kristi Apostel	Old World Successes and New World Challenges: Reducing the Computer Waste Stream in America
17	Cynthia L. Selfe, Gail E. Hawisher, and Patrick W. Berry	Sustaining Scholarly Efforts: The Challenge of Digital Media
18	Charlie Moran	Afterword: Sustainable Writing Programs: A Continuing Agenda
19	Author Biographies and Photos	

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Collectives, Common Worlds, and the Idea of Sustainability: An Introduction

Dickie Selfe
Dànielle Nicole DeVoss
Heidi A. McKee

As anyone who has been involved with computer-supported instruction knows, after the momentous effort to initiate and develop digital classes and programs, there comes the even more momentous effort to sustain such efforts—to ensure that at the same time these projects meet their goals, they also don't suck the intellectual and pedagogical spirit out of those involved.

When we put out the call for this collection we were overwhelmed by the response. Clearly we had struck a nerve in the field: scholars, teachers, and administrators were eager for the opportunity to discuss and reflect on the local, national, and/or international projects in which they had been or were currently involved. In discussing their work, authors in this collection propose a variety of perspectives for analyzing and approaching sustainability. An overarching framework is, of course, evident in the title of this collection, *Technological Ecologies and Sustainability*. The term *technological* is meant to signal our focus on computers and computer networks, although the authors in this volume cover a wide range of digital environments: from personal computers in local classroom contexts to more extended networked environments that affect, and are affected by, institutional and global concerns. The terms *ecologies* and *sustainability* are meant to suggest the important task of maintaining the richly textured technological environments in which composition teachers and students learn, study, and communicate. These environments—which include both human and technological actors—are akin, as many scholars have suggested, to ecological systems (Davison, 2001; Latour, 2004; Nardi & O'Day, 2000; Selfe & Hawisher, 2004) and deserve to be studied in all their layered, interconnected complexity.

In the chapters that follow, contributing authors approach technological ecologies and sustainability from a variety of angles. A few key examples suggests the range of these projects and approaches; Patricia Ericsson, for instance, draws on a number of environmental theorists to view *sustainable development* as analagous to a stool with three equally important legs: the environment, the economy, and society. Kip Strasma applies a "green" industry process—Leadership in Energy and Environmental Design (LEED)—to analyze and assess complex first-year digital literacy programs. And in her usual creative and compelling way, Kathleen Yancey ties the sustained practices of embroidery sampling to our understanding of electronic portfolios. As editors, this variety delights us and reinforces our initial decision to keep an open mind about the terms in our title and the multiple ways of understanding them. But, interestingly, as we review the full range of projects and approaches taken by contributors to this collection, it also makes us, as editors of this collection, feel a bit uneasy. Now that contributors have done the hard theoretical and pragmatic work of defining the key terms *technological*, *ecologies*, *and sustainability* for themselves, we feel the need to do the same.

Perhaps one of our central motivations in this effort is recognizing that the language we use is not necessarily our own. As many readers are aware, there is a strong community of English studies scholars working at the intersections of science, environmental issues, and rhetoric. That community—from whom we borrow terms like *sustainability* and *ecologies*—are rightly concerned about how those terms are employed. Quite likely, they are tired of corporate entities and governmental groups reducing bio-environmental arguments to "sustainable development" with the intent of justifying their "business as usual" practices, practices based largely on economic concerns rather than environmental goals (see Davison, 2001; Harvey, 1998). The fact that we have combined the term *technological* with the valued concepts of *sustainability* and *ecologies* might lead one to assume that we are also appropriating the terms, not in corporate contexts, but in the context of composition studies. Certainly, we hope this is not the case. Although we don't apologize for taking fiscal concerns into account when we talk about sustaining the technological ecologies associated with composition programs and classrooms, we also want to devote most of this introduction to a focus on both *why* educators in writing studies might want to sustain such technological efforts and projects and, importantly, *how* to create computer-supported teaching and learning environments that are directly and visibly informed by humanistic values and, thus, are *worth sustaining*.

To accomplish this important work, we use the germinal work of Bruno Latour (2004; 2005) and Aiden Davison (2001) to focus more deeply and fully on the three key terms of this collection's title: *technological*, *ecologies*, and *sustainability*. Although the chapter authors have identified their own theoretical and methodological approaches to digital teaching and learning environments, as editors, we find Latour's and Davison's work compelling because they help us explain both how and why writing teachers and scholars might take on such difficult work.

CONSIDERING THE TECHNOLOGICAL: BRUNO LATOUR, THE "SOCIAL," AND REASSEMBLAGE

In our effort to unpack the key elements of this collection's title, we turn first to the term *technological*. Our starting place, however, may seem an unlikely one to some readers because we locate our effort in Bruno Latour's understanding of the term *social*. Latour, however, distinguishes more conventional conceptions of *Social* (capital "S") with his own understanding of *social* (lower case "s") by noting that social systems consist of dynamic connections and relationships between both humans (actors) and non-humans (actants). As Latour (2005) noted, "social does not designate a thing among other things, like a black sheep among other white sheep, but a type of connection between things that are not themselves social." (p. 5).

Just as Michel Foucault (1995) showed us in *Discipline and Punish: The Birth of the Prison* that power is not a thing to possess but a set of constantly shifting power *relations*, Latour (2005), in *Reassembling the Social,* asks us to understand what has been called the "Social" (upper case "S") not as a "thing among other things," but as moments of social (lower case "s") connection in the process of constant re-creation or "reassemblage."

Within this context, our editorial goal for this collection is to examine a series of social moments in the process of reassemblage—moments of technology use, system design, teaching, learning, and digital scholarship. These are social moments that we consider valuable and important in literacy instruction and scholarship. We also, however, hope that readers will reassemble for themselves technological ecologies like those that the authors of this collection have found compelling.

Navigating dynamic moments of technological reassemblage, however, is not a simple matter, especially for those actors operating in the context of fundamental changes in scholarship and learning. As Latour (2005) suggested, these are "situations where innovations proliferate, where group boundaries are uncertain, when the range of entities to be taken into account fluctuates" and where conventional methodologies are "no longer able to trace actors' new associations" (p. 11). In such situations, Latour argued for actor-network theory (ANT), a framework of understanding based on the "sociology of associations" (p. 9) among human and non-human actors. As Latour noted, "when you wish to discover the new unexpected actors that have more recently popped up and which are not yet *bona fide* members of 'society,' you have to travel somewhere else and with very different kinds of gear" (p. 22). In the spirit of Latour, we believe the chapters that follow, the analyses the authors provide, and the different tools that can be culled from the rich diversity of their work are the collective gear readers can use to implement productive social ecologies of humans and machines at their own institutions and within their own localized contexts. This gear is portable, and the work of these authors provide navigational aids for the controversies in which teachers are immersed, and the projects they are spearheading and championing at their institutions. We hope that this gear helps techno-activists, techno-ecologists, and techno-rhetoricians to, as Latour put it, "trace connections *between* the controversies themselves rather than trying [immediately] to decide how to settle any given controversy" (p. 23). We believe each chapter of this collection, then, involves controversies with which we must engage rather than rushing to conclude or stabilize. Authors attempt to be descriptive enough to shine a new light on matters of both local and global concern, without the additional burden and fiction of trying to define "matters of fact" (p. 261) and come to final conclusions.

In this regard, as authors in the following pages describe specific technological ecologies in considerable detail, the volume as a whole, we believe, attests to the five key sources of uncertainty that Latour (2005) noted as characteristic of all ANT projects:

1. **No groups, only group formation:** There are no stable groups to study within social networks; rather, there are groups forming and reassembling on a constant basis. Authors in this collection identify shifting associations of people and digital technologies that are "provisional product[s] of a constant uproar" and groups of actors defining "who they are, what they should be, what they have been" (p. 31). Thus, the *TES* authors—by describing specific networks of human and technological actors in complex technological ecologies—can help readers locate similar relationships at their own institutions so that they, too, can imagine new trajectories of work within their own dynamic educational environments.

2. **Action is overtaken:** As Latour reminded us, "action should. . . be felt as a node, a knot, and a conglomerate of many surprising sets of agencies that have to be slowly disentangled" (p. 44). Instructors who teach in digital environments, for example, might be called on to act or engage by students, upper-level administrators, instructional technology staff, outside vendors, etc. One of the challenges of working within robust technological ecologies, then, is trying to follow the proliferation of actors involved in our projects. Who is connected to whom and how are they connected?

3. **Objects have agency:** Teachers and scholars miss a great deal of the real action in a technological ecology if they only attend to intentional, meaningful action performed exclusively by humans. Latour has made the case, in many of his works, for including non-human actants in the social collectives we study. The agency of the non-human actants requires the situated attention of teachers and scholars if our profession is to sustain and nourish healthy technological ecologies. In this collection, readers will note, contributors discuss a number of non-human agents, among them machines, software programs, classrooms, electronic portfolios, input devices, screens, physical and wireless networks; protocols for teaching and learning; institutional procedures (including paths to tenure and promotion, graduate program requirements, etc.), budgets, and lab spaces.

4. **Matters of concern:** To trace, investigate, and act within networks of human and non-human actors a focus on matters of fact. Such situations are too fluid and variable, to unstable, to allow facts to speak for themselves. Instead, Latour argued that inquiries should focus on "matters of concern" (p. 115). In this context, each of the following chapters helps to spotlight matters of concern orbiting within and around each project. For example, Kristie S. Fleckenstein, Fred Johnson, and Jackie Grutsch McKinney don't try to establish matters of fact (i.e., how ecologies of portable computers influence all classes); rather, they focus on transforming a conventional set of classrooms at a particular institution at one moment in time. Jeanne R. Smith and Jay D. Sloan aren't interested in determining how technology works in all writing centers, but how one might first focus on the current, local matter of concern in a writing center before exploring a particular use of technology.
5. **Writing down divergent and risky accounts:** In shifting social terrains, Latour maintained, there is no single genre or model that successfully and completely accounts for all that is happening. Instead, scholars must focus on being "as reflexive, articulated, and idiosyncratic" (p. 121) in their descriptive accounts of social networks as possible. Doing so requires the ability to work—often swiftly—in different modes of analysis, with shifting genres, and with new forms and means of distribution. The wide-variety of modes of analysis and genres of reporting that readers encounter in the following chapters describe technological ecologies cumulatively, from a number of different perspectives, and using a range of methodologies and theoretical lenses.

As editors of this collection, we believe that the uncertainties Latour (2005) described in connection with the study of social networks are factors of the dynamic reassembly going on around and within all sustainable technological ecologies. In the chapters that follow, the authors in *Technological Ecologies and Sustainability* describe multiple actors and actants, knots of activities and agencies, and a wide range of matters of concern (e.g., video pedagogy, digital storytelling, digital programs, research centers). The authors are not in the business of defining what Latour would call "matters of fact" in hopes that they will remain stable but, instead, they identify for readers a number of "matters of concern," offering " risky accounts" of actors and actants and the necessary uncertainties that undergird these complex relationships.

THE THIRD SOURCE OF UNCERTAINTY

Because it is such an odd request of humanist scholars and teachers, it is worth exploring briefly what Latour meant by including non-humans in our discussions. Although it varies in intensity from chapter to chapter, you'll notice in this collection the inclusion of many non-human actors (or actants) in the citizenry of each collective: You'll find objects galore, including input devices, screens, software programs, physical and wireless networks; protocols that allow for action and learning; procedures around which we manage our learning lives (including tenure paths, adjunct status, graduate program requirements, curricular arrangements, etc.); and concerns for fiscal accommodations (including salaries, replacement costs for hardware/software/netware, and the expenses of events and professional development efforts). This is but a truncated list; many other human and non-human agents will come to mind as you read.

Including these non-humans in our discussions, however, create what Latour (2004) called a sense of "definitive doubt" (p. 64). To give non-humans voice in the debates of the collective, Latour, in his own theory-ladened and humorous way, runs through examples that involve "speech prostheses" (p. 67), translators, "the distribution of forms of speech" (p. 68), and spokespersons" (p. 64). He situated himself as engaged "in the long and venerable tradition that has constantly *extended* (author's emphasis) what was called humanity, freedom, and the right of citizenship" (p. 71) to non-humans. We also have to accept the uncertainty ("definitive doubt") about who is speaking for whom. Questions like these come to mind: What human voice is speaking for the digital systems that techno-rhetoricians use daily? How reliable are those speakers? How thorough? We will always have to interrogate the translators of non-humans about their motives and speech acts, but the end result, though quite clumsy and complex, will result in descriptions that are much more representative and potentially sustainable than those where actants have been barred from the debates altogether.

INTERACTING AROUND RISKY ACCOUNTS OF TECHNOLOGICAL ECOLOGIES

Uncertainties abound; as editors, however, we have chosen to add yet another mode of uncertainty by increasing the tempo of the interaction between the writers and readers of this collection. We did this by choosing to publish the collection in a new digital space: the Computers and Composition Digital Press (CCDP). The CCDP is an open-access press built to accommodate digital book-length works and multimodal projects. By publishing this volume as open access and online, our hope is that the social networking functions of current Web 2.0 technologies will allow the collection to take on a discursive life of its own. We expect and hope that the creation of this networked document will add yet another level of uncertainty to the ANT process. We are providing a space for the rapid distribution of the intellectual capital of this collection and for an intense interaction between writers and readers around matters of concern in each chapter. As a result, *Technological Ecologies and Sustainability* is perhaps a riskier account than many others because we hope to learn directly and immediately from those readers interested in sustainable technological ecologies; we hope to connect that extended wisdom to the project itself.

We realize, of course, that we are adding nothing new to the act of publishing. Print publishing also allows for this type of give and take over time. Instead, we are experimenting with the increased tempo of distribution and interaction made possible by an electronic environment. Together with reader/respondents, *TES* constitutes an exploration into creating useful knowledge communities.

We anticipate that our readers might be wondering something like the following: If we allow for all these levels of uncertainty, what hope can we have of learning from and using the descriptions of collectives described in this volume? We try to answer that question by attending to Latour's (2004) *The Politics of Nature*. In that volume he places our hope for addressing serious environmental issues in a process described as the "progressive composition of the best common world" (p. 164). A brief description of that process is not only apropos of the *TES* project, but also provides a slightly more nuanced look at the notion of sustainability.

THE PROGRESSIVE COMPOSITION OF A TECHNO-SCHOLARLY AND PEDAGOGICAL WORLD

Part of the progressive composition process that we outline below assumes a dialogue within the constraints of a timeline. That is, if we (as editors and chapter authors) are remarkably successful in capturing the interest of the academic community, the useful application of the practices described in each chapter will remain part of a "living" document for an extended, but finite, time. They will all retain long-term value historically and theoretically, but, as Latour (2004) suggested, after several years (or perhaps before!) a new collective with human and non-human agents will appear, and new discussions and debates will have to be joined, including discussions of what shall be carried forward and what shall lapse. In Latour's view, the process is cyclical and interactive[1]:

> Step One. ***Gathering the Collective*:** Authors have done their part by calling together and representing the citizens of their collective (human and non-human) in each of the following chapters. We invite our authors and readers to meet online, face-to-face at conferences, or in-print to discuss who is included and excluded in each chapter and how well those citizens are described and represented.
>
> Step Two: ***Conducting Civil Discussion:*** According to Latour, we must allow all the gathered entities to state propositions. Yes, even non-humans, working through translators, will state their propositions relative to the matter of concern. At this stage, the collective attempts to take nothing for granted as author(s) lay out the central issues of the chapter. They present the propositions of agents important to their chapter and then present a risky account online via the CCDP.
>
> Step Three: ***Rank Order the Propositions:*** Temporarily but firmly we, as a community, must then rank order the propositions most important to the issues at hand. These will stand at the end of this temporary convocation as the present *state of affairs* (our term, not Latour's). These are not "matters of fact" but temporary matters of concern about which we can agree and act upon. Eventually, the state of affairs will ***not*** hold, and we will need to move onto the next step.
>
> Step Four: ***Start all over again:*** Inevitably dangerous human and non-human entities will demand to be heard. These new entities and propositions will threaten the current state of affairs and will ensure that at some level our risky accounts will fail. That is to be expected; it is the way forward. When the risky accounts constructed in this volume are endangered, we will start the process of recruiting representative agents and actants all over again. Perhaps this will take the form of a rebuttal volume or a subsequent edition of *TES*, or some creative digital, online forum for collective debate that we haven't even imagined.

Many readers will notice that some of this process is, to some extent, standard procedure in academic discourse. We would suggest that three features—the notion of civil discussions that invite non-human entities to speak and initiate propositions, the speed of online interaction, and a different level of active readership—are likely to change the nature of the interaction around the collection and the individual chapters. Those same readers might also realize that Latour's last two steps have no current place in academic institutions. Who will establish a current state of affairs and then how will it be decided when another collective should be proposed? For that matter, Latour saw no current institutional structures for these steps concerning the environmental matters that he addressed. His response to this dilemma is: "The world is young, the sciences are recent, history has barely begun, and as for ecology, it is barely in its infancy: Why should we have finished exploring the institutions of public life?" (p. 228). Why indeed? Why shouldn't scholars and teachers of English studies once again envision a new institutional space for prioritizing propositions of compelling sustainable technological ecologies and establishing a temporary state of affairs? Why can we not imagine

[1] Latour's (2005) description of a bicameral congress of political ecology is more complex than the system we summarize. He spends chapters on the institutional structure, the conceptual sink holes to avoid, and the many productive roles that people must assume. These are covered in great detail in chapters 3, 4, and 5 of the *Politics of Nature*. We have simplified this process enormously in our reflection here.

an institutional process that will eventually call that state of affairs into question, so that the process can begin again? We and our colleagues have brought to life unique and innovative institutional spaces before as we created (and continue to recreate) writing and learning centers or technology-rich labs and classrooms, as we create new techno-pedagogies out of each online space that leaps into existence (blogs, wikis, YouTube, Facebook, MySpace, etc.), and as we create new digital spaces for publishing online scholarly work. We are perfectly capable of creating institutional space for establishing temporary *states of affairs* on which we can base decisions in the service of sustainable technological ecologies. We are flexible and nimble enough to imagine policies and procedures that will, then, call a temporary *state of affairs* into question and begin Latour's process all over again (collective gathering → civil discussion → ranking of propositions → establishing yet another temporary state of affairs).

But for the purposes of this publication, *TES* editors and authors will begin by placing our propositions about important matters of concern in a forum that will encourage civil online discourse via the Computers and Composition Digital Press. That will be enough for now. Who, in the end, will rank order the propositions collected there and establish a temporary *state of affairs?* Who then will call for the next set of propositions that will challenge the *state of affairs* that accompanies the *TES* effort? That will be the job of our intellectual community as we attempt to accomplish what Latour called the progressive composition of a common world, a world, we hope, worth sustaining.

SUSTAINING WHAT AND FOR WHOM?

We hope, at this point, to have made some progress in laying out a case for understanding technology-rich ecologies for literacy education and scholarship as complex and dynamic networks of technological actants and human actors. We have not, however, clearly articulated our use of the term *sustainability*, a contested concept in the minds of many scholars. Certainly, colleagues who study the rhetoric of science and environmental debates, about global warming, biodiversity, and deforestation will be interested in our use of that adopted term. Although the concept of sustainability isn't unprecedented in the Computers and Writing community or in English studies in general (see Cushman, 2006; DeVoss et.al., 2005; Grabill, 2006; Selfe, 2005), it remains a relatively rare term, nonetheless.

As editors of this collection, we would like to believe that we are part of what environmental theorists like Andres Edwards (2005) called the "sustainability revolution, one that has "transformed the fields of communication (computers, the Internet, e-mail, wireless phones, digital cameras), finance…, transportation…, building…, and medicine" (p. 6). From our point of view, the *TES* project embodies at least four of the five characteristics of this cultural movement:

- The authors within this volume comprise one group among the diverse collectives interested in sustainable practices.
- The chapters within this collection help identify a wealth of issues that need to be addressed under the rubric of sustainability.
- The scholars in this volume are "decentralized visionaries" who explore sustainability from their own situated perspectives.
- The chapter authors suggest "varying modes of action" to support the sustainability of digital communication environments; often these are understood as "oppositional and alternative" (Edwards, p. 7) approaches in the context of conventional institutional responses.

Although gratified and encouraged by our good fit with Edwards' sustainability revolution, we feel obliged to compare our understanding of sustainability with another, more critical and challenging perspective, through the work of Aidan Davison in (2001) *Technology and The Contested Meanings of Sustainability*. Davison asks the "unfamiliar yet still morally resonant question of what sustains us?" In so doing, he notes that the concept of sustainability "offers to move our understanding fluidly back and forth between moral and technical questions and between our moral experience and our technological practices. " Such an understanding, Davison continues, allow us to "hold product and producer together in our thinking, opening up a space within which our understanding of technology can move into the aspirations that animate our moral lives" (ix).

Like Davison (2001), we consider it noteworthy that most discussions of technological sustainability beg the related questions about what we are sustaining and for whom. As he argued, those interested in "latemodern technosystems" (p. 1) need to connect their claims for sustainability explicitly to the values they hold most dear. In presenting this collection, then, we recognize that "technical sustainability is not an end in itself" (Davison, p. 44), but also a means of accomplishing our humanistic and educational goals. This approach has serious challenges in contemporary academic environments, chief among them avoiding the "stifling language of efficiency" (p. 5), addressing issues of scale, and minding economic necessities in which administrators often locate discussions of sustainability. Teachers, more than ever, need to both *articulate and act on their own humanistic goals for sustaining digital efforts and environments* if they hope to re-code these more limited understandings.

For some readers of this collection, Davison's (2001) work could suggest a human-centric approach to sustainability that contradicts a Latourian view of actants and actors as co-equal forces in shaping technological environments for teaching and learning. Davison's approach is tempered and complicated by his recognition of the cyborg nature of human existence. As he noted, "technologies are constitutive of, not external to, our humanity, and they express, shape and perpetuate our philosophical commitments. Through them we build worlds of practice" (p. 7). Our job in this collection, as we understand it, is to help teachers and scholars define the ends they want to address and the values they hope will characterize their research, classrooms, and programs. These are the reasons for trying to sustain technological environments in the first place. The question that Davison's and Latour's work encourages us to ask in this collection and to encourage our readers to ask, we believe, is the following: If we can gather together productive collectives of human agents and non-human actants, and if we can enlist these collectives in support of projects shaped by humanistic values, can we create digital composing environments *worth sustaining*?

The contributors to this collection do not often address this overarching question directly (e.g., is the practice, program, scholarly initiative, etc., they analyze and advocate for worth sustaining). In the process of engaging such questions as what are technological ecologies, how might they and how should they be developed, sustained, and assessed, and why sustainability is such an important goal to pursue in connection to particular projects, however, the chapter authors make many implicit arguments for the worth of their diverse technological projects.

AN OVERVIEW OF THIS COLLECTION

We have divided *Technological Ecologies and Sustainability* into four sections, which move outward from individuals and classrooms to programs and institutions and then even further to global concerns. When we first put out the call for *TES*, Computers and Composition Digital Press had not yet been launched, so we had initially envisioned this collection as a print-based work. However, when the opportunity arose to publish online in an open-access, peer-reviewed press, we jumped at the chance. In the process of preparing the manuscript for publication, we asked contributors if, as they revised chapters, they would also like to take advantage of the multimodal possibilities of online publication, and many have done so, adding audio and/or video components to their chapters.

Part I: Sustaining Instructors, Students, and Classroom Practices

We lead with these chapters because learning, curricula, and pedagogy have always driven our disciplinary use of technological ecologies. Although the scholarly exploration and use of digital media is becoming more important in our disciplines, our commitment to teaching and learning and our need to understand the rhetoric and processes of 21st century literacy practices tend to drive our choices of technosystems.

Ryan Moeller, Cheryl Ball, and Kelli Cargile Cook describe, in “Political Economy and Sustaining the Unstable: New Faculty and Research in English Studies,” their struggle to support digital media faculty both in their scholarly work and in the technology-rich teaching that they seek to do. Departments in English studies are becoming well aware of the importance of recruiting new, digitally active faculty in all areas. To incorporate a nuanced understanding of the literacy practices in a media-rich culture into our programs and curricula, it is essential to work with these new scholars and teachers. But a department’s understanding of *what* material and institutional conditions need to exist to allow these individuals to thrive is likely, according to this chapter, to be wanting. Almost every department is interested in recruiting young digital scholars and teachers, but are often unaware of the technological expense of digital work, the differing needs for tenure and promotion, and the conditions under which technoscholars can best teach and work. The authors employ Phil Graham’s (2005) useful political economy analysis (PEA) to analyze the “complex ecology of an English department.” They track various meanings of concepts like *technology* and *research* through their relative usages within their specific ecological settings, and they argue that—to sustain digital media faculty—individuals, departments, and institutions need to work in concert.

In “A Portable Ecology: Supporting New Media Writing and Laptop-ready Pedagogy,” Kristie S. Fleckenstein, Fred Johnson, and Jackie Grutsch McKinney also argue for holistic approaches to developing technological ecologies. In the process of transforming a set of conventional classrooms into laptop-ready learning spaces—a seemingly mundane redesign project, but one with ripple effects that influence every teacher and student who uses those facilities—they provide us with a process for sustainability. Although they find the laptop pedagogy that developed something worth sustaining, it was not something they came to immediately or easily. As the authors note, “we acquired the ’portable ecology’ of our laptop-ready classrooms, and thus made possible our new media pedagogical emphasis, while fumbling our way into this new way of thinking.” Their story illustrates the *when* of new media pedagogy (i.e., institutional timing), the interdependencies of institutional units and media workers, and the value of ecological or holistic thinking about design efforts. The chapter is packed, in fact, with both practical and theoretical advice derived from their design and teaching experiences which are, in turn, informed by Gregory Bateson’s (1972/1987, 1979, 1991) idea of contextual evolution.

“Stifling Innovation: The Impact of Resource-poor Techno-ecologies on Student Technology Use,” by Anthony T. Atkins and Colleen Reilly, reflects the authors’ investments in student and faculty access to systems that facilitate literacy learning and digital writing instruction. What Atkins and Reilly hope to accomplish with this type of access, and what they hope to sustain, is pedagogical *innovation*. In particular, the authors illustrate the struggles of innovative teachers trying to develop sustainable new media composition initiatives in an underresourced program and institution. Atkins and Reilly provide us with an analysis based on three perspectives: 1) a detailed description of the techno-ecologies in which teachers work (including many influential non-human actants); 2) student perspectives (garnered via a survey study) about instructional technologies used in their classes and outside of class to prepare assignments; and 3) their own, insider/instructor perspectives regarding their resource-poor techno-ecologies. The three perspectives make it clear how pedagogical innovations can challenge the technological and human infrastructure of institutions and departments, and how the sustainability of digital initiatives cannot rest solely on individuals working alone.

In "Video for the Rest of Us? Toward Sustainable Processes for Incorporating Video into Multimedia Composition," Peter J. Fadde and Patricia Sullivan take on a particular and a particularly challenging media. They make a strong case for sustaining the proliferation of video production in our culture and classrooms, while at the same time detailing the fundamental difficulty of sustaining both the system requirements of video and the extensive production process that most videographers engage in. By pairing down the processes and technological ecologies to essential components, they provide us with "sustainable processes for incorporating the powerful, but still difficult to manage, medium of video into multimedia composition." Their chapter and the approaches for which they argue are a must-read for anyone interested in developing video as a component of composition programs (whether in general education or major-specific courses).

Kathleen Blake Yancey, in "Portfolios, Circulation, Ecology, and the Development of Literacy," would like us to sustain digital portfolio ecologies for assessment, reflection, and learning. She describes several versions of highly layered e-portfolio ecologies and how they are encouraged and sustained in four different institutional contexts. Yancey is also interested in cultivating and sustaining a type of self-sponsored student writerly identity. She closes her chapter by drawing an analogy between e-portfolios and embroidery sampling, arguing that samplers provide flexible platforms for literacy—that they are self-sponsored, personalizable and reiterative, and that they are compositions playing important identity-making roles.

Part II: Sustaining Writing Programs

In Part II, we focus more attention on the institutional entities—in particular the programs and program administrators—who provide the material, technological, and human resources to support and sustain digital writing work.

We begin with Michael Day's "The Administrator as Technorhetorician: Sustainable Technological Ecologies in Academic Programs." Day takes this opportunity to imagine the complexities of sustaining digitally integrated first-year composition programs and the role that a writing program administrator has in that process. Through detailed, nuanced examples, Day names and voices the concerns of a collective of agents and actants, including the technological infrastructure (such as machines, software, networks, and lab spaces); the faculty development support system, both university-wide and program-specific efforts"; and much more. Day concludes with a three-pronged approach to sustaining such complex techno-ecologies, which includes: "listening to global conversations about technorhetoric, processing and adapting technorhetorical theories to local circumstances, and then acting with the best interests of key stakeholders in mind."

Patricia Frietag Ericsson proposes a framework for analysis and action to others taking on the difficult task of making connections between academic silos in the development of technology-intensive interdisciplinary majors. In "Sustainability and Digital Technology: Program Analysis Via a 'Three-legged' Framework," Ericsson advises us—after a much more thorough history and definition of sustainable development than we have provided in this introduction—to attend to three components of any enterprise worth sustaining: “the economic, the social, and the ecological.” She draws her three-part framework from leading environmental agencies around the globe who have recognized that sustainability must be assessed and worked toward in these three primary areas concurrently. Applying this framework, Ericsson conducts a fascinating exploration of the Digital Technology and Culture (DTC) degree program that she and colleagues have developed at Washington State University in Pullman. Although Ericsson discusses economic sustainability as critical to all techno-ecologies, we are particularly taken with her focus on sustaining both a “socially just university” and a “knowledge ecology.” The framework she provides and the specific lessons to be drawn from her analysis of the DTC will be beneficial to anyone seeking to develop, assess, and revise digital writing programs.

In “The Homegrown Hybrid Academy: Toward Sustaining a University-wide Culture of Use,” Beth L. Brunk-Chavez and Shawn J. Miller respond to some practical constraints at their institution (the University of Texas at El Paso) and their very diverse “always on” student population by spearheading a new university program. In the process, Brunk-Chavez and Miller imagine new institutional structures and the support components that might help encourage its adoption across departments. They develop a program that avoids a deficit model of faculty teaching, with an emphasis of blame toward faculty not adopting technology. Instead, the program supports an “empowered user” (teacher) of technology who knows better than most how to teach in their own specialized area of the university. Empowered faculty do not meet the “net generation” on students’ terms alone, but work to “embrace a common set of goals and a desire to reach them.” The culture of use Brunk-Chavez and Miller are trying to develop has a key component worth sustaining: users (teachers and students), as they both using and influencing the design of the technologies they adopt to reach their common literacy goals. Both groups (and the administrators developing programs for them) must identify and appreciate the “fit” that a particular approach or technology has and participate in multiple feedback loops in institutional development processes. The authors grapple with this model as they address issues that many of our readers will recognize: space constraints, increased enrollments, and top-down technology initiatives.

Kip Strasma draws extensively from the environmental movement for approaches to studying sustainability. He does this, interestingly enough, through an environmental assessment tool for green building. In “Using the LEED Evaluation Tool to Assess the Sustainability of First-Year Computers and Writing Programs,” Strasma applies the Leadership in Energy and Environmental Design (LEED) assessment tool to the complex first-year literacy programs in two-year colleges, programs much like those that many of us are trying to support and sustain. The values that Strasma’s LEED tool encourage are powerful, useful, and include stewardship of the best of multiple teaching approaches, a balanced support for resources, and the need for continuous pedagogical learning and workshopping, among other assessment attributes. His application of this approach to 2-year colleges is particularly important as teaching loads, changes in techno-pedagogical initiatives, and mobile student populations intensify the process of sustaining a technology-intensive composition program.

Jude Edminster, Andrew Mara, and Kristine Blair take on a particularly intractable and important issue in higher education in “Digital Studio as Method: Collaboratively Migrating Theses and Dissertations into the Technological Ecology of English Studies.” There is enormous pressure by digitally native students and those faculty comfortable with new technologies to take advantage of the modalities afforded by digital theses and dissertations. In addition, we are all interested in how these traditionally remote genres can be more broadly distributed as digital works, because they represent some of the most cutting-edge knowledge creation in our disciplines. But the complexities of institutional change that might result from electronic theses and dissertations (ETDs) is not to be underestimated. Edminster, Mara, and Blair discuss the experimental nature of their work in a cyberstudio as they work toward a techno-ecology sustainable for faculty, students, and institutions in the highly charged atmosphere of thesis and dissertation production. They illustrate clearly Latour's (2005) notion of "risky accounts" as they discuss both the successes and failures of their project to date. In addition, they begin moving us out of the direct consideration of programs per se and toward discussions of ancillary centers and studios housed on the borders of direct programmatic design and development.

Part III: Sustaining Writing Centers, Research Centers, and Community Programs

The diversity and strength of writing studies spans a broad array of institutional and community frameworks, and many centers and programs reside outside of traditional department or university structures. The next section of our collection addresses some of these centers and programs as technological ecologies and speculates about their importance and sustainability.

James E. Porter has spent several years collaborating on the development of the Writing in Digital Environments (WIDE) Research Center at Michigan State University. In "Sustaining a Research Center: Building the Research and Outreach Profile for a Writing Program," Porter addresses how he, colleagues, and other teams might sustain such a rare entity in humanistic disciplines, particularly where the research of the center focuses on projects that have two very contested characteristics within the Humanities: projects are both interdisciplinary (often working with partners outside English studies and the Humanities) and digital in nature. The digital components of our culture and our digital teaching practices will "change the processes, products, and contexts for writing, particularly in organizational and collaborative composing contexts" (WIDE Collective, 2006). The WIDE Center is an exemplar program that sustains itself and contributes, in productive ways, to the writing programs and writing culture at MSU. Readers, we think, will be particularly interested in how such centers can make writing research more broadly available to our colleagues across the institution and how that, in turn, might involve us in interdisciplinary research projects. The economic realities of our institutions these days make both moves important.

Jeanne R. Smith and Jay D. Sloan argue for the importance of sustaining communities in "Sustaining Community and Technological Ecologies: What Writing Centers Can Teach Us." They take one of the fundamental components of writing center pedagogy—interpersonal communities of reader and writers—and make it a corner stone for technoecology development, no matter where in the university those ecologies make their home. In particular, Smith and Sloan address the frequent tension between those interpersonal, hard-earned, face-to-face learning relationships commonly found in writing centers (and, sadly, often not found in many other parts of college life) and the growing potential for digital interactions between writing center professionals and students. Readers will find useful an approach to integrating technological ecologies into our institutions in ways that do not disrupt our commitments to social networks. Smith and Sloan forefront "writing as process… knowledge as a collaborative construction, and [an] insistence upon the value of face-to-face interaction." Smith and Sloan describe several attempts at technological integration that both fail and succeed in interesting ways.

Mike Palmquist, Kate Kiefer, and Jill Salahub offer us another theory of analysis and sustainability in their chapter "Sustaining (and Growing) a Pedagogical Writing Environment: An Activity Theory Analysis." They are deeply involved in the ongoing process of developing and sustaining the incredibly rich online site, the Writing@CSU project, which provides extensive open access to content, teaching and learning resources, and interactive communication forums. They provide an overview of another theoretical system of analysis, Activity Theory, that helps them plan and understand the construction and sustenance of those important systems. Online and hybrid education is part of the learning environment of the future, and English studies professionals should bring to bear their humanistic expertise to the design and implementation of those online systems and curricula. Palmquist, Kiefer, and Salahub's analysis and activity theory components are important and useful in this endeavor. Those components involve "a complex interaction of subject, tool, object, outcome, rules, community, contradictions, and division of labor." The complexity of the analysis and the project under analysis itself "reduces the tunnel-vision effect of [often technical] snapshots of the project,… allows us to focus on interactions rather than on discrete elements, and… uses the history of the project generatively to plan further enhancements." We find their sense of sustainability compelling, as it "implies both continuity and enhancement, building and adapting."

Providing another provocative methodology for addressing sustainability is Lisa Dush's "Genre-informed Implementation Analysis: An Approach for Assessing the Sustainability of New Textual Practices." Drawing from her extensive on-site field study as well as in-depth interviews with key informants, Dush examines one community organization's attempt to implement a new textual practice: digital storytelling. She details a number of ways the multi-year effort to implement digital storytelling failed, and argues that for organizations to develop and sustain effective programs, they need "a theoretically grounded, reflective, and analytical tool." The tool Dush proposes is North American genre theory; as she explains, "what I suggest is making use of the rich unit of analysis that is at the center of genre theory, the genre, by using it to periodically assess ongoing implementations of new textual practices." Dush provides a number of specific analytic tools, including a genre inventory tool and a protocol for documenting the textual, discursive, social, and material impacts of the pilot project's activity.

Part IV: Sustaining Scholarship and the Environment

Our final section illustrates the inclination among computers and writing scholars to look beyond our own borders and to rethink our place not only in the university but also in the world. Our call for chapters dealing with and oscillating between terms like technology, ecologies, and sustainability encouraged authors to think broadly; to see our interdisciplinary, physical, and digital connectedness; and to imagine our roles and responsibilities as they ripple out beyond our particular, context-specific projects.

Lisa Lebduska, in "Sustainable Digital Ecologies and Considered Limits," sees our changing use of tools, techniques, and practices as a type of commons with measurable limits, and advises us to adopt an approach that environmentalists have debated for years. She develops a complex approach to sustainability by distinguishing between "development" and "growth," by applying the environmental conditions of a limited commons to the notion of development, and then complicating that further with Lawrence Lessig's (2001) concept of an "innovation commons." This fascinating amalgam of theory and approaches makes use of Lessig's distinction between rivalrous (where resources are confined and limits seem appropriate) and non-rivalrous (where limits contain innovation and creativity in unhealthy ways) commons. She draws a picture of delicately balanced tensions between constructive and destructive uses of limits and the rivalrous and non-rivalrous components of each of the technological ecologies that we want to sustain.

In the next chapter, Shawn and Kristi Apostel address an issue that we feel has been too long neglected in our field. It seems remarkable to us, as editors of this collection, that—as reflexive as our literacy pedagogies and theories ask us to be—the computers and writing community has rarely (perhaps never?) acknowledged our responsibility for encouraging the growth of one of the most immediate global concern. Apostel and Apostel's chapter, "Old World Successes and New World Challenges: Reducing the Computer Waste Stream in

America," paints a troubling picture of e-waste trends worldwide and describes a very spotty recycling-based response to this waste-stream issue in the United States. Apostel and Apostel ask: How do we, as a community of technophiles, help sustain our health and physical environment and that of developing countries? How to we contain or deal with the toxic e-waste that we help generate? Apostel and Apostel have visited facilities and studied the much more systematic recycling policies developed in the European Union over the past several decades. The models from the E.U. that they describe challenge us in the U.S. to not only sustain valuable techno-ecologies for learning and scholarship, but also to take responsibility for encouraging (at local, state, and national levels) ethical recycling practices that will address the e-waste we leave in our wake as we steam into the 21st century.

In our final chapter, "Sustaining Scholarly Efforts: The Challenge of Digital Media," Cynthia L. Selfe, Gail E. Hawisher, and Patrick W. Berry make the case that if we are to remain relevant in this culture, our scholarly efforts will increasingly involve digital production, research, and practices. They also take the opportunity to explicate the challenges to departments of English and other units in the Humanities when digital scholarship is introduced to our scholarly regime. We are certain that a wide range of readers will find it productive to consider their effort to describe "a productive middle ground between the historically informed values of the humanities and the changes currently informing emerging information ecologies in digital environments." Their compelling goal for this chapter is to sustain "our scholarly efforts, informed by feminist values and undertaken in ways sustainable within the contexts of our own lived experiences as scholars." Their discussion, we think, can clearly be applied to many disciplines across the university, even those in the sciences where we often look for leadership and ingenuity. For this reason we have placed this chapter at the conclusion of these collected works.

AS WE GO FORWARD

Our goals for this collection have been relatively simple. We want to give colleagues—those now and in the future—a forum for discussing, analyzing, and reflecting on the technological ecologies they have worked to create and sustain and/or that they have studied. We also hope that readers (and we include ourselves and contributors in this category) will have access to a wide variety of theoretical and pragmatic approaches for thinking about and working through the myriad of issues that arise when considering technological ecologies and sustainability, always keeping in mind the important consideration of sustaining what for whom. And we hope to have contributed to and set the groundwork for ongoing discussions of the issues raised—and those not raised but perhaps needed.

All publications, of course, have a goal to spark dialogue. One of the reasons we're delighted to publish with Computers and Composition Digital Press is the opportunity to make this dialogue more immediate and more public. It is our dual hope that readers will become authors as they take the ideas raised in this collection and discuss them in such venues as conferences, papers, and blogs, sharing their insights, reactions, experiences, and ideas. And it is our hope that *Technological Ecologies and Sustainability* authors will become readers as they read and then respond to the ongoing discussion. Our choice to publish this collection online with Computers and Composition Digital Press (a choice more important and "risky" for the chapter authors than for ourselves) has allowed us to imagine these pieces collectively and individually as knots of associations and as matters of concern that trace a network of associations between humans and non-humans. While the entire collection is a risky account may fail, the excitement of sparking communities of writer/readers is infectious. We look forward to participating with other agents to keep each other accountable as we describe technological ecologies worth sustaining.

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Introduction to Section I
"Sustaining Instructors, Students, and Classroom Practices"

We open *Technological Ecologies and Sustainability* with discussion of ways to sustain the engagement of instructors, students, and classroom pedagogy. Grounded in the contextual circumstances of specific institutions and individuals, the chapter authors provide rich and broadly applicable approaches for analyzing, developing, and nurturing technological ecologies.

The opening chapter by Ryan Moeller, Cheryl Ball, and Kelli Cargile Cook is a collaboration among newly hired faculty and their department chair. In "Political Economy and Sustaining the Unstable: New Faculty and Research in English Studies" they describe their struggles to support digital media faculty in their scholarly research and in the technology-rich teaching they were hired to do. Using Phil Graham's political economy analysis they analyze the "complex ecology of an English department" and they argue that to sustain digital media faculty individuals, departments, and institutions need to work in concert. They close their chapter with an excellent set of recommendations that will be useful for any computers and writing faculty and the colleagues and administrators who support them.

In "A Portable Ecology: Supporting New Media Writing and Laptop-ready Pedagogy," Kristie S. Fleckenstein, Fred Johnson, and Jackie Grutsch McKinney also argue for holistic approaches to developing technological ecologies. Using Gregory Bateson's idea of contextual evolution, they reflect on the process of transforming a set of conventional classrooms into laptop-ready learning spaces. In their detailed reflection they offer an analytic model for examining, developing, and sustaining pedagogical initiatives. Their chapter illustrates the interdependencies of individuals, institutions, and material contexts, and the value of ecological or holistic thinking about design efforts. Anyone undertaking the design, redesign, evaluation or re-evaluation of pedagogical and material ecologies will be particularly interested in this chapter.

In the third chapter in this section, "Stifling Innovation: The Impact of Resource-poor Techno-ecologies on Student Technology Use," Anthony Atkins and Colleen Reilly describe their and their students' struggles as digital writing teachers and learners in an under-resourced program and institution. Drawing from their own experiences and from student perspectives gathered in a survey study, Atkins and Reilly provide us with a detailed analysis of the strategies used and the hardships faced by instructors and students seeking to work within resource-poor ecologies. Their work makes clear how digital curricula can challenge the technological and human infrastructure of institutions and departments, and how the sustainability of digital teaching and learning initiatives cannot rest solely on individuals alone. Atkins and Reilly's chapter offers useful research and analytic approaches for those seeking to chronicle and change their own institutions' technological ecologies.

In "Video for the Rest of Us? Toward Sustainable Processes for Incorporating Video into Multimedia Composition," Peter Fadde and Patricia Sullivan take on a challenging media. They make a strong case for sustaining video production in our culture and classrooms, while at the same time detailing the fundamental difficulty of sustaining both the system requirements of video and the extensive production process that most videographers go through. By paring down the processes and technological ecologies to essential components, they provide us with sustainable processes for incorporating the powerful medium of video into multimedia composition. Their chapter and the approaches for which they argue are a must-read for anyone interested in developing video as a component of writing studies programs and courses.

In the closing chapter of this section, Kathleen Blake Yancey, in “Portfolios, Circulation, Ecology, and the Development of Literacy,” provides several ecological models of digital portfolios for assessment, reflection, and learning. Drawing from detailed and highly layered e-portfolio ecologies and how they are encouraged and sustained in different institutional and individual contexts, Yancey argues for cultivating and sustaining a type of self-sponsored student writerly identity.

She closes her chapter by drawing an analogy between e-portfolios and the needlework practice (and art) of embroidery sampling, arguing that just as samplers provide flexible platforms for literacy—they are self-sponsored, personalizable, reiterative, and identity-making—so too should portfolios be as flexible. Yancey’s chapter provides useful insights on the educational impact of particular eportfolio ecologies and what learning different models support and sustain.

CHAPTER	1
TITLE	Political Economy and Sustaining the Unstable: New Faculty and Research in English Studies
AUTHORS	Ryan (Rylish) M. Moeller Cheryl E. Ball Kelli Cargile Cook
OVERVIEW	In this chapter, we present political economy analysis (PEA) as a methodology for understanding and working within the often-shifting techno-ecologies of an academic department. As a case study, we document the shift in an English department at a Carnegie Research University (High Research Activity) in the western United States brought about by the hiring of two junior faculty members with specializations in new media and technology. PEA methods allow us to focus on the material conditions that prompted the new hires (i.e., a new Ph.D. program in the Theory and Practice of Professional Communication) and those brought about by their arrival (e.g., changes in new faculty startup packages, the necessity of funded research to the sustainability of the entire department, and renewed pedagogical and economic attention paid to the department's computer labs). After we discuss PEA, we present a series of interwoven narratives that analyze and consider our experiences through the PEA lens. We conclude with a list of recommendations—for job candidates, hiring committees, faculty, and administrators—that will help departments, we hope, better anticipate, support, and sustain the work of new technology specialist hires.
TAGS	agency, budget, change, Cheryl Ball, commodification, computers, consciousness, contradictions, culture, ecology, English Department, equipment, faculty, funding, hire, hiring committee, institutional critique, job candidate, Kelli Cargile Cook, lab, mediation, mediator, negotiation, PEA, Phil Graham, political economy analysis, professional writing, Richard Ohmann, Ryan Moeller, shaper, shifts, start-up, startup, support, sustain*, student, technolog*, Utah State University, value, writing instruction
AUTHOR BIOGRAPHIES	Ryan M. (Rylish) Moeller is an assistant professor in the Department of English at Utah State University. He teaches courses in professional writing, rhetorical theory, and the rhetorics of technology. Moeller's research focuses on the effects of technical discourse on human agency, especially within the consumer electronics industry. His work has appeared in *Technical Communication Quarterly*; *Kairos: A Journal of Rhetoric, Technology, and Pedagogy*; *Fibreculture*; *Computers and Composition Online*; *Works and Days*; and in edited collections. He is currently working on a book manuscript that examines the rhetoric of play in professional, consumer-oriented discourse. Cheryl E. Ball teaches and studies new media reading, composing, and evaluation strategies, especially as they relate to digital scholarship. She has a PhD in Rhetoric and Technical Communication from Michigan Tech and an MFA in Poetry from Virginia Commonwealth University. Ball has published in *Computers and Composition*, *Composition Studies*, *Convergence*, *Fibreculture*, and *Computers and Composition Online*. She is editor of *Kairos: A Journal of Rhetoric, Technology, and Pedagogy*. Her online portfolio can be found at http://www.ceball.com. Kelli Cargile Cook is an associate professor in the professional and technical writing program at Utah State University. Her research focuses on technical communication pedagogy, online writing pedagogy, Web-based training, and technical communication program development and assessment. She co-edited *Online Education: Global Questions, Local Answers*, which received NCTE Award for Excellence for Best Collection in Technical and Scientific Communication in 2006. Cook has recently authored a Web-based training program, *Hiring with Excellence*, as part of an NSF ADVANCE grant, and has revised the third edition of *The Elements of Technical Writing*. She has directed both the undergraduate and doctoral programs in

	professional and technical communication at Utah State. Cook served as the president of the Council for Programs in Technical and Scientific Communication from 2006–2008 and is currently serving as vice president of the Association of Teachers of Technical Writing.
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Political Economy and Sustaining the Unstable: New Faculty and Research in English Studies

Ryan (Rylish) M. Moeller
Cheryl E. Ball
Kelli Cargile Cook

The technological ecologies of English departments are changing rapidly. Like Bonnie Nardi and Vicki O'Day (1999), we see these changes primarily as the result of human activity. Over the past 10 years, English departments have hired an increasing number of new faculty from sub-fields like professional and technical communication and computers and writing; these new hires often have research needs different from the typical needs of other English hires. Traditionally, English hires have required little more than a basic computer, a budget for travel and book purchases, and an office for planning classes and meeting with students. These new hires are a different species, however, and often have vastly different kinds of material needs. Some of these needs involve significant technology purchases. These needs, in fact, are more comparable in scope and sometimes cost to the laboratories provided for scientists and engineers, and often push the limits of an English department's technological ecology.

Meeting the needs of these new species has required us to draw upon our best practices as rhetoricians, making arguments for significant investments in our new faculty beyond the typical start-up package. At the same time, these new faculty have required us to accept the burdens of significant investment—if we require more research investment, then our research must return more to the university, as a whole, through grants and other funding sources. This process of continual investment, recoupment, and renegotiation requires new models of sustainability in which communication and negotiation are constant. New faculty with more and different needs must be frank and honest about those needs, and hiring committees, senior faculty, and administrators need to anticipate the ecological changes these new faculty bring to departments.

When hires are made based on combined technological and pedagogical need (e.g., a professional and technical writing or computers and writing specialist), an ecology is often pushed beyond what the hiring department may have even thought necessary. In the instance when specialists are asked to teach multimedia composition—as is happening in more universities (see Anderson, Atkins, Ball, Homicz Millar, Selfe, & Selfe, 2006)—then the computer labs, the location of much teaching and learning, becomes a crucial factor in the department's political and monetary economy within the university. The "when" of new media (see DeVoss, Grabill, & Cushman, 2005)—that is, the at-the-moment infrastructural and technological set-ups and breakdowns that happen within a department or university lab setting—always impacts how new media specialists can teach what they were hired to teach. When new media breakdowns happen, as Dànielle DeVoss, Jeff Grabill, and Ellen Cushman put it, the infrastructure supporting new media work affects not only the pedagogy, but the impact of individual job stability and tenurability and, thus, the department's sustainability as a whole. One solution to this issue is to look at new English faculty as agents who manipulate certain pressure points at various times within a complex, political economic ecology—a social system demonstrated through material, measurable effects and affectations. These pressure points become more visible with the introduction of new agents and new technologies, both of which push the boundaries of a department's constraints.

In this chapter, we present political economy analysis (PEA) as a methodology for understanding and working within such shifts in department ecologies. We share two new faculty hire examples from an English department in a Carnegie Research University (High Research Activity) in the western United States. Specifically, we focus on the following ecological changes: those that prompted their hires (i.e., a new Ph.D. program in the Theory and Practice of Professional Communication) and those brought about by their arrival (e.g., changes in new faculty startup packages, the necessity of funded research to the sustainability of the entire department, and renewed pedagogical and economic attention paid to the department's computer labs). After we discuss PEA, we present a series of interwoven narratives that analyze and consider our experiences through the PEA lens.

POLITICAL ECONOMY ANALYSIS

We use political economy analysis (PEA) to examine shifts in a department culture brought about by two new hires. In his *Politics of Letters*, Richard Ohmann (1987) explicated the basic methodology of PEA as placing the object of study against a superstructure that mediates culture and ideas through ideological institutions, which serve as a means of preserving and reproducing class structure. By superstructure, Ohmann meant laws, institutions, cultures, beliefs, values, customs, and so on—essentially, all that surrounds us. Similarly, Sarah Collinson (2003) defined PEA as focusing on the "distribution of power and wealth between different groups and individuals, and on the processes that create, sustain and transform these relationships over time" (p. 14).

In "Literacy, Technology, and Monopoly Capital," Richard Ohmann (1985) located the mock crisis of computer literacy within the larger hypothetical literacy crisis. After situating technology and literacy within a cultural ecology, he then provided historical evidence to support his claims that these crises have been used to serve the needs of monopoly capital through the management of labor and the control of sales within a "universal, national market, increasingly managed by the same corporations that produced the goods" (p. 679). To demonstrate the collective efforts of the elite force of technology producers, Ohmann provided several reflections: suppose writing had been developed by slaves to communicate without their masters' knowledge; suppose print technologies had been developed by radical, local groups for their own purposes rather than being aimed at a mass audience; suppose wireless communication had been invented by women working from home to establish "networks of childcare and concern" (p. 680). Instead, the technologies that we study have evolved, "shaped within particular social relations, and responsive to the needs of those with the power to direct that evolution" (Ohmann, p. 680).

In "Issues in Political Economy," Phil Graham (2005) examined a history of political economy and argued that PEA is instrumental in understanding global social dynamics, including "politics, finance, and military propaganda; resistance, revolution, and technological change; commercial production, distribution, exchange, and consumption; fundamentalisms of all sorts, peace activism, and environmental struggles," all of which "are now conducted largely within the realms of communication" (p. 25). To understand the meanings of various communicative acts, Graham posited three elements that comprise the basic PEA approach:

- **Consciousness:** "the total awareness of life which people have. It includes their understanding of themselves as individuals and of their relations with other individuals in a variety of forms of organization, as well as with their natural environment" (Smythe in Graham, p. 22).

- **Value:** “forms of labour that can be bought and sold in order to produce artifacts of conscious activity” (p. 23); these include systems of symbolic capital as well as systems of monetary value.
- **Mediation:** tracking the “movement of meaning from one text to another, from one discourse to another, from one event to another. . . . the constant transformation of meanings. . . as media texts and texts about media circulate in [various forms] and as we, individually and collectively, directly and indirectly, contribute to their production” (Silverstone in Graham, p. 24).

For Graham and other political economists of communication, PEA is about how cultural values are produced, maintained, and transformed through the production, distribution, value, consumption, and use of various cultural artifacts, including communicative acts such as advertisements, political debates, reports, memos, and conversations. Our particular challenge, brought about by the introduction of two new members to our department’s already diverse ecology, was to understand and articulate this ecology through PEA, allowing us to evaluate a range of actions through their potential for affecting that ecology.

PEA is useful in understanding the complex ecology of an English department, especially in tracking various meanings of concepts like “technology” and “research” through their uses within specific ecological settings. Generally, we have found—largely through trial and error, and through applying PEA mostly after the fact—that the basic and most effective PEA method can be articulated as a series of four basic steps:

1. Locate a shift, contradiction, or new development within a culture under investigation that suggests an interesting site of contention or cultural training. This step identifies what Graham (2005) referred to as *consciousness* by exposing different agencies in conflict.
2. Look for patterns of commodification or processes of valuing, both in terms of artifacts *and* agents. Here, we are looking for value—Graham’s notion that labor results in measurable artifacts of potential change.
3. Identify professional organizations, experts, or institutions that mediate and shape responses to the contradiction identified in the first step. These organizations exist to mediate and sustain (or to resist) particular transformations within a discipline or field.
4. Discuss the impact of that mediation upon the further propagation of the culture.

Keeping these methods in mind, what follows is our reflection as colleagues in one specific ecology affected by the introduction of two new faculty members; one of us was established in the department (Kelli), and the other two were the new faculty members (Cheryl and Rylish). Across our discussion, we advocate situating complex, social ecologies as being inherently unstable. Sustainability comes from constantly communicating and negotiating ecological changes through a dialectical process of change.

SHIFTS, CONTRADICTIONS, AND NEW DEVELOPMENTS

Consciousness, as we see it, is a process of learning and knowing in an effort to better understand one’s own life, connections to others, and environment. Often, this process of learning and knowing is stimulated when we notice shifts, contradictions, and ruptures within regular, sometimes transparent, everyday processes, but consciousness can also be evoked when something new is introduced into our environments. Gaining a new consciousness of the situation, we re-assess ourselves, our positions, and our surroundings in terms of these developments or shifts. In the narratives that follow, you will see a growing consciousness enacted as we individually describe our newfound awareness that the technological ecology in which we worked would need to undergo a change to sustain the two new media specialists invited to join our faculty.

Kelli: To fully understand how Rylish's and Cheryl's arrivals affected shifts, contradictions, and new developments in our English department, it helps to know something about our culture. Our department is no newcomer in using technology to teach writing. Even before Rylish's and Cheryl's hires, we had a thriving technological ecology. With the aid of a state-funded technology grant in 1995, the department's faculty and a dedicated technical support staff planned and delivered its first online composition courses. This project led to the development of a homegrown classroom management system for teaching composition, an online master's program in technical communication, and a robust and interactive departmental Web site (Smitten, 2005). The CMS was among the first developed by English faculty for the teaching of English, and our fully online master's program was among the first of its kind in the country. By 2005, our chair reported in the *ADE Bulletin* that

> our departmental home page [received] almost a half a million hits a year—not exactly ESPN but an indication of the steady usage our site receives as faculty members, students, and visitors come to it seeking their e-mail, course Web pages, online classes, events information, or any of a dozens of pages or functions available. (Smitten, p. 70)

Our mission statement identified teaching with technology as one of our defining characteristics. We embraced technology. Nevertheless, as a department, we struggled with this identity; we were, after all, an English Department—a department seldom associated with technology—and few people outside the department could conceive that members of our faculty might require money or computer labs to do their work. When Rylish and Cheryl arrived, we found ourselves facing, on one hand, stereotypical images of what others' outside our department thought we should be and what we, as a faculty in professional and technical communication, knew we could be.

Cheryl: In mid-August, Rylish and I discovered that we had independently negotiated appropriate start-up packages to perform the teaching and research we'd been hired to do. (Because the negotiations happened in early February, before we signed our contracts, we didn't know the other had been offered a position, or we might have negotiated in collaboration.) We also realized that despite our fruitful email negotiations with administration, we should have requested start-up requirements in our contracts, which would have meant the funding would be made available as soon as we arrived on campus—an issue of 20/20 hindsight for new faculty to consider. Once we were on campus, it became evident that our earlier negotiations had inaccurately estimated the department's economic situation, which had changed in those 6 months (due, in part, to our hiring) and which we couldn't have fully understood until we arrived.

Rylish: Because I knew the department's history with cutting-edge uses of technology, I assumed that the department was prepared to support my research by providing access to these technologies, including mobile technologies and computer game hardware. The email negotiations said *yes*, but the budget said *no*. So Cheryl and I waited for equipment. Our approved start-up requests consisted only of a new office computer that took months to get because of the convoluted purchasing ecology on our campus. After a couple of months, I became very frustrated. I was situated in an office with a very old computer, barely capable of opening an email application or operating basic word-processing software (and certainly *not* at the same time), and a hard-back chair similar to those found at study desks in the library, which made it physically difficult to sustain long hours of work at the computer. Additionally, my start-up request for a computer was approved for only the cost of the central processing unit—without the monitor, keyboard, mouse, printer, or scanner I had requested and desperately needed. Our building was not equipped with wireless networking capabilities, so the personal laptop that I had been bringing to work was limited in its mobile capabilities.

At this point, I constructed a sign out of a torn-up cardboard box that read "Will Work for Research $$$" (see Figure) and (almost) seriously considered camping outside of the office of the vice president for research. When I evaluated my particular ecology, I didn't recognize—and thus I was not conscious of—the agency I had through sustained negotiation. Instead, I sought agency through more confrontational methods.

Figure. A picture of "the sign" born out of frustration, but which now hangs on the department bulletin board in the English department as a sort of an inside joke among the authors.

Kelli: To say Rylish's sign surprised me is an understatement. When my colleague, who chaired the graduate program in technical and professional communication, and I saw it, we knew we had a serious problem. We met with Rylish and Cheryl to learn what was happening. When we learned that their problems emerged from a lack of funding for technology, we decided to act quickly. We talked with Rylish and Cheryl about their unmet needs, actions that eventually led us to college and university administrative offices where we argued for investments in our new faculty and the work they hoped to do—and were hired to do. First, we visited our department chair to advocate for our new colleagues. Although the chair was sympathetic, he was clear that the department had no money to buy expensive multimedia technology. He recommended that we take the matter to the dean first and then to the vice president of research.

Cheryl: I was grateful that our senior colleagues were willing to invest time—time that they weren't required to spend—to make our research possible and our tenure-track lives better. My research differed from Rylish's in that mine focuses on pedagogical practices of teaching students to read and produce new media texts. The university investment that I needed was to improve the lab in which I taught students to produce these texts. If the students in my classes couldn't compose new media, then my research in this area would be halted, and my tenure case would be uncertain. However, because our only source for immediate funding was to request additions to our start-up packages from the vice president of research, my asking for money to make the teaching lab more suited to my pedagogical (and thus research) needs was out of the question. I had to approach the situation from a different angle, an angle that my colleagues and the department chair, once we discussed the situation, helped me to imagine. We would propose starting a small, new media "research" lab from scratch—similar to how scientists do.

Rylish: Armed with the original job ad for my position, which called for a technology specialist, and some statistics on the meager nature of external funding in the humanities, we were able to convince all three levels of administration (department, college, and the vice president of research) to support our research with modest start-up funds. I say "modest" because these were nowhere near what my colleagues in the sciences would expect or need to equip and staff a research lab. As a result of our senior colleagues' mediation and with the support of our department chair and dean, we were able to secure $35,000 in startup funds to develop a collaborative research lab and project development space with faculty in the department of instructional technology, and to develop the English department wireless networking infrastructure.

Cheryl: From that $35,000, Rylish purchased the equipment he needed for his gaming and mobility research (high-end PCs, gaming consoles, wireless PDAs, etc.), and I got the equipment I needed for teaching new media production (video cameras, scanners, and audio recorders)—portable tools that also allowed groups of students to work on new media projects outside of the new media lab. The department and college also provided $15,000 in matching funds to upgrade the student lab. All told, Rylish and I shared $50,000 to put toward technological resources in support of our research agendas. By the end of our first year, Rylish and I had set up the new media lab in the instructional technology department—pooling our monies with an assistant professor starting his own multimedia lab there—and had purchased most of the equipment we needed for teaching and researching the following year.

A downside to this generous start-up package was the amount of time we spent trying to purchase and set up the four-machine lab, time that included everything attendant with administering a larger lab—such as researching price comparisons, hauling machines across campus, installing software, driving across the state to pick up chairs that were on sale but couldn't be delivered, and putting computer desks together. I didn't do any research that semester because I was preparing the lab so I *could do* my research. Had the resources already been in place when we were hired (or had been considered in the summer prior to our arrival), that research year wouldn't have been lost. The contradiction in performing the lab administration work is that Rylish and I were completing these tasks because we had to in order to complete our research; in other words, we took on the duties and responsibilities of lab directors and technical support because our start-up funds didn't include monies to hire someone to manage the lab for us. Although the added technological resources helped us to purchase all the equipment we needed, we still lacked the long-term resources to maintain, staff, and support the equipment. The student lab could be maintained with student fees, but the external lab—our "research" lab—was subject to our ability to find external grants to continue supporting it. Throwing money at technology without a necessary infrastructure will always bring technology specialists to this uncertain place.

Rylish: Rather than sound ungrateful, we hope to illustrate that sustainable research agendas do not magically appear with relatively small investments in technology. Investments—especially with respect to time—should be in people and in lines of communication, not just in equipment. When hiring technology specialists in English departments, our ways of thinking about material needs must change. This is not to say that specialists do not bear some responsibility of shouldering the burden by seeking external funding when and where appropriate to further their research needs, but to be truly sustainable, an ecology must be flexible and always changing to accommodate the various needs of its diverse agents.

PATTERNS OF COMMODIFICATION

In this first year, we recognized that the traditional methods of supporting new faculty members were insufficient, creating delays and even roadblocks to their research agendas. We were thus grateful when these problems appeared to be resolved with the new start-up packages and matching department and college funds. We soon realized that these solutions were only a step in the ongoing process of departmental technological sustenance. Furthermore, we can now see how these shifts, contradictions, and developments created new patterns of commodification. PEA led us next to considering patterns related to the revaluing of agents (faculty, students, support staff) laboring within our modified and commodified technological ecology; a growing awareness of the new economy required for producing works of both functional and symbolic capital; and the advantages and disadvantages of the commodification of our technologically rich computer classroom. The stories that follow explore these patterns of commodification and illustrate our growing awareness of and reaction to these patterns.

Kelli: Our success in raising funds for our new hires came with a price: Both the dean and the vice president of research required us to accept the burdens of their investments—in other words, if we, as faculty members, require greater research investment, then our research must demonstrate a greater return to the university. Our research agendas must now not only produce knowledge for the field, but also bring in dollars. This requirement has brought its own challenges as we struggle to find sources of outside funding that will support research in technical and professional communication and computers and writing studies. As our work becomes more commodified, we find ourselves engaging in other shifts, such as educating our development officers and research office administrators about the research we can and will do, and mining their knowledge of grant-making resources to raise additional funds to support our work.

Rylish: Our department has made some promising strides in this area. In our most recent discussions of promotion and tenure, for example, we have convinced administrators to value grant-seeking efforts and to give some amount of credit to unsuccessfully submitted grants, even if such credit goes toward merit and service. Our department head has also granted a course release to a faculty member to serve as a liaison between faculty and development officers and opportunities. This faculty member will facilitate collaborative opportunities among the English department faculty on identified external grants.

I have been lucky in my efforts to secure funding. At the time we wrote this chapter, I have been a part of three external grant proposals and three internal grant proposals, and we have secured about $200,000 to further technology research within the department. Such success doesn't come without cost, though, because every grant proposal signifies countless meetings with potential collaborators and development personnel, a significant number of drafts, as well as intense negotiations about the distribution of funds and potential research outcomes. Moreover, each successful grant typically signifies several unsuccessful attempts to secure funding.

Ironically, the viability of our work has also been questioned within the English department, especially when we began to attract attention for the cost of our research and equipment. I'm often goaded about the validity of the Xbox 360 I carry around campus, and Cheryl and I have each been referred to as adding a particular "quirkiness" to the department. I think that it becomes incumbent upon those of us who are pushing the technological ecology of the department to educate our colleagues—in addition to industry partners and external funding reviewers—about the value and validity of our research.

Cheryl: This negotiation—educating others as to the validity of our technological needs in regards to research and teaching—also must happen within our curricula. As I began to investigate the department's ecology, one that contains a multitude of areas (e.g., literary studies, American studies, British and Commonwealth studies, professional and technical writing, English education, creative writing, and folklore), I was surprised to learn that one of the department's graduate curriculum committees had discussed the possibility of adding the word "Technologies" to the Literature and Writing masters degree title, as a way of suggesting that technology (pencil, paper, or computer) could be the glue that holds the more disparate areas together. Although that suggestion was turned down, the fact that it was a possibility indicates that sometimes, as new media specialists, we fail to recognize those who might support us within our departments because we become complacent to change, or perhaps desensitized by the lore that circulates in English departments. If we become open to alternative, more interdisciplinary ecologies, however, we might notice that the negotiations of technology's role in the department happens frequently in meetings, in hallways, even in our classrooms, and that we can become an agent of change in those settings. (For continued help in being a change agent, I look to Laura McGrath's (forthcoming) work on collaborating with, consolidating resources of, and simply listening to her colleagues in the hallways of and beyond her English department.)

Kelli: Our curricula and, consequently, students' educations were affected in both positive and negative ways. Positively, we are able to offer them more diverse technological training and learning opportunities, and graduate students in our department have more cutting-edge technologies available for their education and research. These technologies allow us to provide students with additional opportunities to build core competencies desirable in industry (Rainey, Turner, & Dayton, 2005; Whiteside, 2003). Working with research technologies by bringing them into our classrooms, students are better prepared for industry and the corporate world.

I am concerned, however, with the commodification of students—in other words, I wonder if we may be enculturating them through our labs and classroom activities to be "better" consumers and indoctrinated users of certain technologies. We also haven't substantially addressed possible concerns about how "workplace" training goes hand-in-hand with our continued "progress" in improving labs and classroom spaces. Theoretically and practically, what is driving our decisions to improve the technology in our labs? Carolyn Miller (1989) addressed a similar concern in "What's Practical about Technical Writing?" when she wrote that

> being useful is not necessarily being good. . . . Because Marxist critique features practical activity as a central concept, it raises questions that are particularly germane to technical writing, questions about whose interests a practice serves and how we decide whose interests should be served? (p. 154)

In our case, whose interests are being served by the incorporation of technology into our teaching and learning spaces?

Rylish: I see commodification as a process of valuing something—of assigning measurable or tangible value to an object, artifact, or agent that otherwise might be left to stand on its own. The Marxist in me wants to delimit value in (mostly) economic terms, but I think that there are many ways of valuing something. For example, by having students design Web portfolios in Macromedia's (now Adobe's) Dreamweaver or design their documents in Adobe's InDesign, we send a clear message of how we value this software. We also run the risk of perpetuating a common myth among technical writing students—that potential employers want software specialists rather than communicators.

Kelli: Another perennial question is "how much technology should we teach?" Because technological skills appear to be valued highly in job advertisements, students cry out for more concrete software instruction. The managers who will employ our graduates, however, report that they rank collaboration skills and writing competencies well above technical skills when they are reviewing job applicants (Rainey et al., 2005). Even more troubling is our seeming complicity in this process. At conferences and in our own department, teachers who teach with technology are sometimes accused of "selling out" and reproducing aspects of the dominant, technology-seduced culture.

Whether I buy this idea completely or not, we ought to consider students and their possible indoctrination as consumers as part of our political and ecological analysis, given our dependency on these technologies. To balance this enculturation and possible indoctrination, it seems right—and ethical—that we also teach technological analysis and critique to help students recognize the benefits and constraints of the technologies with which we work.

Rylish: I think there is certainly a both/and aspect to the types of enculturation we are talking about here. We do place value on the technologies we bring into English studies, both from a research and a pedagogical perspective. This is certainly going to have an effect on the departmental culture as well as effects on students, but what helps me out of what otherwise looks like a binary problem (we can either accept or resist the dominant culture) is to think about students as mediators and shapers of (at least) a part of our ecology. I have learned from Kelli the activity of having students examine the job market and explore what experiences, skills, and awarenesses qualify them for their preferred careers—showing them, for example, that listing Dreamweaver under the "software" section of their resume is not enough to get them a job. Cheryl has presented students with the actual department budget and empowered them to advocate for the changes they deemed most important. And I have been very careful to show students how their own technological choices will affect their audiences. For example, when working with computer games, it's very easy to find yourself on the cutting edge of technology. More often than not, game developers are creating games for next-generation computers and platforms. So it's easy to see how games push the consumption of technology. When faced with a choice of development platforms for game design, I asked students to look at the technological requirements for each platform and decide which platform offers greater accessibility, even at the risk of lower-end graphics or functionality. The choice became easy for them, and they immediately decided on the more-accessible platform. Placing students in positions where they act as mediators and shapers of change helps them to negotiate the patterns of commodification that our choices impose upon them.

MEDIATORS AND SHAPERS

Students were not the only mediators and shapers who became important agents as our departmental technological ecology evolved, but they were among the first. Indeed, we drew upon our faculty as a whole, departmental and university public relations experts, and other resources to promote the new ecology we were shaping. In the following stories, we explore student roles in mediating our technological ecology, and we introduce other characters (some human, some not) who also influenced our abilities to situate ourselves and our work. As you read these stories, you will likely note that the principal characters are those of us who engage in new media research and support it. Recognizing our agency in creating and maintaining a sustainable technological ecology is among our most important lessons learned.

Cheryl: The first semester when I taught Web design with few resources to help students compose with current standards of practice, we had frequent conversations about the frustrations this caused. The lack of resources prompted a new lesson plan, one in which we examined the student-fee model of lab funding compared to what a well-equipped, sustainable lab costs to fund. Students were shocked at the difference between what they paid per course ($35 then, $50 now) and what students at other universities paid per course for a similarly sized, sustainable technological environment (in some cases, well over $200 per semester in departmental lab fees, with an additional $150 fee per media-composition course; see Selfe's 2005 *Sustainable Computer Environments* for a sample sustainable lab budget based on income from this range of student fees). After that lesson, students were appalled at how little they were paying and stopped complaining to me about the lack of resources. Instead, they started complaining in their course evaluations, writing comments for administrators whom they knew read the evaluations. In those comments, students made heart-felt suggestions about the need for more technological resources so that their teachers could implement the kinds of assignments students needed to communicate effectively in digital environments.

Rylish: Along with the acts of critique and institutional change Cheryl engaged in with students, we also found that bringing in public speakers helps to educate colleagues on the value of our teaching practices and research agendas. The second year I was here, I brought my dissertation director to campus. He had recently published a book on game studies and rhetoric, and I asked him to speak on why humanities scholars should pay attention to computer games. We had a standing-room-only audience. Additionally, I use the publicity resources in the English department to disseminate research successes. For example, I nominate students for research awards whenever possible, and I invited two undergraduates to present their work at a regional conference. Each time, I make sure the announcement gets posted on the department Web site.

Kelli: As a whole, the technical and professional writing faculty has employed public relations and student project showcases to focus attention on the products students create. In our showcases, we promote our clients, their services, and student work. For examples, students in the advanced multimedia class have created DVDs for instructors to use in their smart classrooms, built Web sites for literary archives, and redesigned the departmental Web site. The success of our showcases has spread, with many other professors now holding end-of-the-semester course conferences, in which students present their literary and creative work to the public. Through our use of showcases, not only are we changing what our colleagues know about our work, but we have also begun to change the way the department thinks about student work. These events have further shaped our administrators' willingness to support new projects.

Rylish: For good and for bad, laboratories also make for strong mediators both on campus and in public opinion generally. This is partly due to the cult of science, but it is also due to the ethos of credibility and validity that the space and title give to our work. As we mentioned earlier, using part of our start-up funds, Cheryl and I worked with another junior faculty member from the department of instructional technology to establish a research and development space. We called it the Creative Learning Environments (CLE) lab, and outfitted it with four high-end computers for project development. Having that space, along with the other requisite publicity materials like a Web site that featured ongoing research projects and a mission statement, afforded us something concrete to point to when asked what exactly it is we do, or why we ended up in an *English* department. Spaces can be either physical or virtual (and both, as in the case of the CLE lab), but space bestows a certain legitimacy to one's work, because space is often one of the most precious commodities on campus.

Since this article was originally drafted, the CLE lab has dissolved due to the shifting ecologies of both departments: the need for physical space by all units as well as the always shifting needs and resources within our respective departments. However, my work with our colleague from Instructional Technology has not ended. We submitted a collaborative grant proposal along with two faculty from Graphic Design and Art to create a new lab, the Interdisciplinary Media Research Consortium (IMRC). (This grant proposal was funded, and you can view the Web site for the IMRC project at http://imrc.usu.edu/.)

MEDIATION IMPACTS

Although the impact of mediators and shapers may never fully be known, we have seen ecological changes beyond our original expectations. We now realize that although our department was well known as a highly technological site, its ecology had become stagnant. It had not changed significantly in years. Previously, hires had been assimilated into the ecology and their work sustained by it; for our new colleagues, however, there was no such assimilation. Their arrival required us to move from a stagnant and complacent state into one that was active and in flux—one that reflects the constant state of transition that technology now mandates and that we must attend to in our teaching and research. This new state, still not stabilized, continues to impact our department. Despite seemingly constant transition, we move in the direction of stability, and we want to note that we now have an ecology that likely will not return to its previous stagnant shape; stable, that is, does not mean static. We see more work ahead as we sustain yet continue to evolve technologically. While the third stage of PEA addresses the ways in which connections, organizations, and experts mediate and shape change, the fourth stage focuses on identifying the potential impact of such mediation. The fourth stage also focuses on cultural propagation—the ways in which change is fostered and thus continued. Our final stories speculate on the effects our new ecological state may bring.

Kelli: At this stage in our programmatic development, we are evolving our images as English scholars, slowly changing computer-by-computer and grant-by-grant how we conduct our research and how others perceive our research. As chair of the undergraduate program in technical and professional communication, I have worked with my senior colleagues to articulate our research agendas to administrators who still think of us as traditional English scholars, and I have worked to support my junior colleagues as they seek the resources they need to do their work well. In taking on these roles, I have wondered how I can go further to enhance our research profiles within our department and throughout our university, how we can become more adept and successful at grant-making, and how I can better mentor and collaborate with fellow faculty members as we move through this learning and teaching process. Answers to these questions, I think, are the keys to a sustainable ecology within our program and our department.

Rylish: In *Technology and the Contested Meanings of Sustainability*, Aidan Davison (2001) remained cautiously critical of the sustainability movement, preferring instead to craft “apparently disparate experiments in the experience of sustenance together into new social structures capable of providing genuine alternatives to the imperative of production” (p. 212). In our efforts to change the technological ecology of English departments and humanities programs, we should remain vigilant that we not replace one sustainable model of research with another that may prove equally rigid and limiting. After all, the image of the lone scholar writing amid stacks of books has sustained us for generations, leading E.L. Godkin (1974), a prominent newspaper editor at the turn of the 20th century, to say of the professorate: “a professor is looked on as sort of a bookish monk, of whose opinions on the affairs of the world, nobody need take any account” (p. 153). To imbue new English faculty with transformative power, we must secure many opportunities for them to demonstrate success in research, and through various types of media.

Cheryl: We are hopeful that our impact within the English department, as well as across campus, has been felt, and that the need for technological resources within humanities departments is on administrative radars. We were all encouraged during the summer of 2006 when the department head approached Rylish and me to write an internal grant proposal that would award departments up to $100,000 for innovative projects. While he was hoping this would be another chance for the department to gain technology, Rylish and I knew that adding technology-for-technology’s-sake—without pedagogical, theoretical, and infrastructural support for doing do; that is, without the support of colleagues like Kelli and our systems administrators—would put the department into the same technological tailspin it experienced after the resources from the early-1990s technology grants and our start-up funds started to age. We wrote the innovation grant not to add new technology, but to replace and update outdated technologies in our student labs. The upper administration recognized the potential in this proposed change, granting us $86,000. We included provisions for creating a sustainable lab budget, including infrastructural and staff support for these systems. The staff-support line items, however, were removed from our final budget, suggesting that we have much work to do to convince administrators that throwing money at equipment still isn't the solution. Although the new technology is nice, our primary goal is to make an impact on the ecology of the entire department, so that the lab becomes a place where students and teachers want and feel welcome to work, and are supported in that work. Our first lab "open house" occurred when Rylish invited a new faculty hire in technical communication to present his work to the department in the newly remodeled and refurbished lab space.

SUSTAINING THE UNSTABLE

Our analysis comes full circle at this point. Reflecting on our conversation, we now draw some conclusions about how new faculty hires can shift and change departmental technological ecologies and what we might do to keep these ecologies sustained, robust, viable, and healthy. The most prominent conclusion that we have come to via the PEA methodology is to approach English departments as complex, dialectical ecologies in a state of constant flux. If they are not changing, they should be. Mapping out the various relationships between agents, artifacts, and mediators will assist new faculty in assessing their potential agency within the ecology, and will assist other agents in negotiating the mediational effects of new and shifting agents.

Obviously, bringing new faculty into a departmental culture creates shifts, contradictions, and new developments. What we found, however, is that the effect of these changes extended beyond our program and beyond our particular technological needs, rippling through conversations and interactions with departmental faculty and college and university administrators. Perceptions of who and what we were as a program and a department were abruptly (and necessarily) shifted when contrasted with what we hoped to become with the integration of our new faculty members. Although "technology" was once considered a boundary-spanning word to describe our department's disparate programs in literature, folklore, American Studies, creative writing, and professional and technical communication, the technology that Cheryl and Rylish needed to do their work was uneasily integrated into our departmental culture. New additions—such as video cameras, iPods, and game consoles—were not previously recognized as typical or perhaps even "acceptable" technologies for English scholars to use or study. Furthermore, college and university administrators, who were much less aware of our departmental penchant for technology integration, were often surprised by our request for monies to support the technologies and labs our new hires needed.

We offer a set of recommendations to help better anticipate and support technology specialist hires:

Job candidates:

- During the job interview, locate the obvious agents and mediators in the department. How do they position themselves with/against technology?
- Be honest about your material needs. As soon as possible in the hiring process, get your research needs and expenses approved in writing. (And if you require particular items to accomplish your research agenda, be able to explain why.)
- Thoroughly investigate your teaching conditions *before* you plan your classes; the technology you anticipate may not be available.

- Examine tenure and promotion policies for statements concerning grant-seeking activities. Ask to speak with faculty members who have brought money into the department to support their research.

Hiring committees:

- Identify the potential material needs of candidates. Seriously consider whether your department has the infrastructure to support such needs.
- Explore key ecological components likely to be stretched by potential candidates (technology needs, teaching labs, etc.). Identify support personnel and put hire(s) in touch with those people as soon as possible.
- Understand protocol for conducting start-up fund negotiations. Realize that just because the new hire may be in an English department does not predetermine his or her research needs.

Our physical teaching and research spaces were perhaps the most changed. New peripherals, printers, computers, and servers were added to our computer classrooms. We could record images and sounds, and we could play and alter with new applications. Not only did we have the hardware to play games in our labs, but we could also build and test them, too. Most importantly, students had server space to save their work. But our spaces and the technologies housed within them were not the only commodified products in this process. People, too, were changed in the process. As a program, we asked for seed money to support our work in exchange for promises to seek additional external funding. By integrating the new technologies into our teaching practices and curricula, we increased the technological expertise of students and senior colleagues, but—to counterbalance the effects of this integration—we had to re-evaluate our curricula to assure ourselves that we were teaching students to critique these technologies as well as use them.

Based upon these realizations, we make the following recommendations for faculty:

- Practice being an active observer. Identify key mediators and shapers who can help advance your research agenda. Don't overlook students, colleagues, or administrators from outside your immediate specialty and department.
- Use formal titles for established research relationships. To the extent that you can, give your research space a title. This adds legitimacy and ethos to your research efforts and makes visible what might go unnoticed (i.e., some computers in a room become a lab with active research going on).
- Position any request for funds as seed monies to be used (at least in part) for seeking external funds. Be able to demonstrate expertise and activity in grant-seeking efforts.
- Identify ways that your research is pushing the ecology of the department, including the curriculum. Be prepared to support these changes as needed.
- Hold public events and publicize them widely. Invite the public, including parents, friends, administrators, local business leaders, community members, etc.

At the beginning of this process, we knew that our departmental and university administration would be among the most powerful mediators of change. It is difficult to forget our strategy sessions—those in which we strategized how to "sell" our ideas to administration. What has surprised us, however, is how many unexpected allies we found in shaping and mediating our departmental technological ecology. Among those allies were fellow faculty members in programs other than technical communication, who met with us to talk about potential changes we could bring about and to share ideas about how to bring our plans to fruition. We, initially, did not expect students to be such influential shapers or mediators; their enthusiasm for our new hires and their work was evident in their attendance at public events and in the showcases we held to exhibit their work. We found little resistance in the classroom itself, where students embraced the new technologies and helped us articulate arguments in favor of better and more technology access.

As we seek more and more technology specialists within English departments, promotion and tenure committees and administrators can facilitate ecological shifts by not only applying a PEA-based analysis to help anticipate and negotiate shifts, but also by:

- Being aware of the diverse material needs of faculty. Material needs are more than desks, chairs, books, travel, office supplies, and computers. They can and often do include *other* technologies or, at least, access to technologies and space. They also can and often do include technological needs beyond an established default start-up computer package.
- Finding ways to support faculty research in all its diverse forms:
  - Supporting funded research by giving faculty credit toward promotion and tenure for reasonable efforts to secure funding, and discussing what “reasonable efforts” may be.
  - Seeking to understand how the faculty member’s colleagues and professional organizations value their work.
- Establishing forums and methods for publicizing faculty research accomplishments from Web sites and newsletters to award ceremonies and financial support for disseminating research results (presenting at conferences, giving public presentations, consulting, etc.).

This is the point at which we realize that what we have brought about through this process and analysis is a new ecology, one different from the place at which we started, but similar in that it, too, must change and grow to sustain its inhabitants. For instance, since we originally drafted this chapter in 2006, the status of the labs has evolved through the internal grant mentioned earlier that we received in 2006–2007, as well as through an additional internal grant in 2007–2008. More importantly, the status of many supportive faculty members and administrators has radically changed, including those who have left the institution, transitioned into larger administrative roles, been hired since (at least one of whom has a direct impact on the department’s technological ecology through directing the lab), and, sadly, those who have passed away. As people and resources and curricula change, so, too, must the outcomes of our political economy analyses: We must remember that departmental ecologies are always unstable, and our work to make them stable will result in changing, but hopefully better, understandings of the whole department’s use of technology in research and teaching.

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CHAPTER	2
TITLE	A Portable Ecology: Supporting New Media Writing and Laptop-ready Pedagogy
AUTHORS	Kristie S. Fleckenstein Fred Johnson Jackie Grutsch McKinney
OVERVIEW	In this chapter, we argue for the value of systemically attuned thinking in planning, implementing, and supporting curricula and infrastructure for a 21st-century writing program. We focus specifically on the development of laptop classrooms and new media pedagogy at Ball State University, a mid-sized state institution in the midwest. We show how our successes in transforming classrooms, modernizing our writing center, and offering faculty development evolved out of a series of missteps, miscommunications, and failures that taught us to think in holistic ways about the emergence of institutional change. Our narrative unfolds in three steps. First, informed by Gregory Bateson's ecology of the mind, we offer and illustrate three characteristics of systemically attuned thinking: see the complex web, understand news of difference, and emerge into change. Then we offer insights into technological sustainability, highlighting the role of faculty support and writing center collaboration. Finally, we conclude with three guidelines for enacting technological change in writing programs: think spatially, think rhetorically, and think temporally.
TAGS	Ball State University, change, classroom*, composition, configuration, context, critical literacy, curriculum, deutero-learning, ecology, first-year, Fred Johnson, Gregory Bateson, interdependent, Jackie Grutsch McKinney, Kristie Fleckenstein, laptop, literacy, mind, models of change, news of difference, portable, renovation, rhetoric*, Stuart Selber, sustain*, systematic thinking, technolog*, Writing Program, writing
AUTHOR BIOGRAPHIES	Kristie S. Fleckenstein is associate professor of English at Florida State University where she teaches rhetoric and composition classes in the undergraduate and graduate programs. She is the author of *Visualizing Change: Vision, Rhetoric, and Social Action in the Composition Classroom* (Southern Illinois University Press, 2009) and *Embodied Literacies* (Southern Illinois University Press/National Council of Teachers of English, 2003), which received the 2005 Conference on College Composition and Communication Outstanding Book of the Year Award. She has also co-edited two collections on imagery, rhetoric, and teaching. Her work has appeared in *College English*, *College Composition and Communication, JAC*, *Rhetoric Review*, *Computers and Composition*, and other journals. Currently, she is researching the linkages between nineteenth-century photography—the oldest of the new media—and the rise of current traditional rhetoric. Fred Johnson teaches courses in writing, film, new media, and American literature at Whitworth University. His research and writing explore social-networking theories, particularly focusing on literary representations of social networks, innovation in social networks, and research as a social-networking task. Jackie Grutsch McKinney teaches undergraduate and graduate courses in rhetoric and composition at Ball State University, where she has served as Writing Center Director since 2003. She has publications in *The Writing Center Journal*, *WPA*, *The Journal of Teaching Writing*, and several edited collections. In her current research, she tries to imagine how writing centers will need to evolve to meet 21^{st}-century challenges and to support 21^{st}-century student writers.

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A Portable Ecology: Supporting New Media Writing and Laptop-Ready Pedagogy

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> "The most important task today is, perhaps, to learn to think in a new way" (Bateson, 1972/1987, p. 468).

At the 2007 Conference on College Composition and Communication, the writing program at Ball State University received the CCCC Writing Program Certificate of Excellence. The awards committee recognized Ball State's writing program "as exemplary due to its solid approach to teaching composition as an act of reading and writing across modes of communication"—a pedagogy made possible by the immersion of all of our 3,000-plus yearly writing program students in technology-rich classrooms. Without that immersion, we could not have fostered work with new media technologies, core to our first-year composition focus on literacy across different modalities. But to ensure immersion for all students, we had to acquire additional technology-rich classrooms. We did this by soliciting and obtaining institutional support to renovate four traditional classrooms into laptop-ready classrooms (two in summer 2005 and two more in summer 2006), an institutional commitment that required the allocation of more than $150,000 in a tight budget atmosphere.

In this chapter, we recount how we transformed a set of conventional classrooms at Ball State University, a mid-sized Indiana state institution, into laptop classrooms. We demonstrate the usefulness of systemically attuned thinking for the planning, implementation, and maintenance of both curricula and physical infrastructure for a wired, 21st-century writing program. Looking back on our experiences, we see that our success—which evolved out of missteps, miscommunication, and failures—resulted from learning to think holistically, not atomistically, about the emergence of institutional change. We crafted the portable ecology of our laptop-ready classrooms, and thus made possible our new media pedagogical emphasis.

This story is important for three reasons. Our account of stumbling into a systemically attuned way of thinking provides local-level insight into what Dànielle Nicole DeVoss, Ellen Cushman, and Jeffrey T. Grabill (2005) called the "when of new media writing." They argued that, while much composition scholarship explores the "what and why" of new media, little attention has been paid to the "when" of new-media composing, particularly the "institutional and political arrangements that—often invisibly—allow these new-media products to emerge in the first place" (p. 15). Second, our story reveals both the abstract interdependencies of institutional units and the material interdependencies of persons working together (or failing to work together) from different university departments. Third, we demonstrate how an ecological orientation privileges neither environment nor individual; rather, it fuses the two into a way of thinking with implications for effecting change at other institutions.

We begin this chapter with a brief introduction to Gregory Bateson's (1972/1987, 1979, 1991) idea of contextual, systemic evolution—evolution that is an interdependent, nonlinear process rather than an independent, unidirectional process. We then describe the renovations we gained and frame our achievements within a retrospective epiphany: that our successes stemmed from the moments when we thought and acted in tune with or in response to the kinds of contextual systems that Bateson describes, while our failures stemmed from the moments when we thought and acted atomistically. We next explore, in Batesonian terms, what it means to see a complex web of interdependent agents communicate news of difference throughout that web, emerge into change, and sustain change. We conclude by suggesting ways in which other writing programs can adapt holistic thinking to plan for, and possibly bring about, technological change.

THINKING SYSTEMICALLY

We did not initiate this project by deliberately thinking in systemic terms; we only realized the necessity of systemic thinking as we struggled to align the various competing agendas of the writing program, the English department, and the university so that we could accomplish a specific goal: the renovation of conventional classrooms into laptop-ready, technology-enhanced classrooms. However, by the end of our initial efforts to secure funding and bring about classroom renovation in summer 2005 and summer 2006, we had become committed to what Bateson (1972/1987), quoted in the epigram at the beginning of the chapter, called thinking in a new way.

Cultural anthropologist and key contributor to the post-WWII Macy Conferences on cybernetics, Bateson argued for the necessity of what he called an “ecology of the mind.” Briefly, he asserted that Darwin’s focus in evolution on the unit of the species was wrong-headed. Individual species, like the horse, did not evolve in response to the existence of the grassy plains (i.e., nature did not “select” for survival those proto-horses best suited for existing on grass); rather, grassy plains and horse evolved together. As Bateson (1991) explained:

> the horse isn’t the thing that evolved. What evolved actually was a relationship between horse and grass. This is ecology. If you want a lawn, which is the equivalent in the suburbs of a grassy plain, there are certain steps you have to take. First of all you go and buy a lawn mower. This is the equivalent of those front teeth of the horse. And you have to have this in order to prevent the grass from going to seed. If the grass goes to seed, it dies. It’s done its thing, it thinks, and it dies. So you keep it from going to seed with a mower. Secondly, if you want to make a tight turf, you have to squash it down, so you buy a roller—at best one of those rollers with sort of fists on it all over that’ll knock it down. This is a substitute for horses’ hoofs. And finally, if you really want to have a good lawn, you go and buy a sack of manure and substitute it for the back end of a horse in order to deceive the grass into doing ecologically what it would do if it had hoofed animals living on it. Thus the unit of what’s called evolution out there, is really not this species or that species. It is an entire interlocking business of species. (p. 276)

What is necessary, Bateson argued, is to stop thinking in atomistic terms regarding individual species, whether the species is the grass or the horse. “There is always, of course, violence to the whole system if you think about the parts separately” (p. 265), he warned. Instead, we need to think in terms of context—for it is the context, not the isolated organism, that evolves and survives. Bateson's systemic thinking emerged as essential to our efforts to design, staff, and use four laptop-ready classrooms.

EMERGING INTO VIEW

Our writing program's portable ecology emerged into view over the course of 2 years, as, in service of our larger curricular goals, four conventional classrooms were converted into laptop-ready classrooms. Our first technology proposal, submitted in spring 2005, requested that the English Department's two most cramped, least-friendly teaching spaces be reconfigured to help meet our program's new technology needs. Both of these rooms were rectangular nooks left over after previous renovations, and they were stuffed, when we began, with 25 tablet-arm chairs each. Given the long, skinny shape of these rooms, along with their cinder-block walls, poor lighting, and lack of modern technology, faculty sometimes called them coffins. But, with the help of the university interior designer, we reworked these tight spaces, first adding carpet, new lighting, a coat of paint, video projectors, and whiteboards, then bringing in new ergonomic tables with power outlets and Internet ports at every seat. ADA regulations left us few options for arranging the tables, but we did finally fit 25 seats into each room, using clusters of six seats in one room (see Figure 1) and a less flexible, conference table style arrangement in the other, even smaller room.

Figure 1. Revised room configuration: six-seat clusters.

The original inspiration for the renovation, of course, was our awkward combination of curricular goals, limited funding, and lack of suitable space for creating new classrooms equipped with desktop computers. Capitalizing on the fact that approximately half of Ball State students were arriving on campus with laptops in tow, course sections scheduled into these rooms were marked "laptop required" in the catalog, and plenty of students were ready to sign up. Rather than committing to the purchase and maintenance of more than 50 new desktop computers, we purchased 12 laptops and issued these to teachers who would need them. Teachers could carry a laptop and easily plug into the projectors when they arrived to teach in one of the new laptop classrooms. Outfitting and maintaining these rooms cost (and will cost) far less than outfitting and maintaining desktop computer-based classrooms, and so we solved the curriculum, funding, and space problems all at once.

Even better, the makeshift laptop solution turned our old coffin-like rooms into nice (if still imperfect) teaching spaces. Teachers soon discovered advantages we had not originally anticipated. The laptops allowed them to easily transport and access their data and classroom presentations, and, once they arrived in the classroom, they were running presentations, pulling up data, and displaying Internet sites using a familiar computer that performed as expected, rather than using a permanent classroom teaching station with unpredictable quirks. Because there are no permanent desktop computers in these rooms, the desks can be used alternately as computer workstations or as flexible table space for workshopping and other activities, something which was—and is—impossible in many of our desktop computer classrooms. Student laptops broke down now and then, but the hassle this created was no worse (at worst) than the hassle created by broken-down machines in our desktop computer-based classrooms, and such problems tended to be considerably less vexing than coping with the inevitable decline and obsolescence of machines in desktop computer classrooms. Students immersed in BSU's wireless computing culture tended to look after the health of their own machines. In short, then, these classrooms worked and even opened up unanticipated possibilities for teachers and students. These laptop-ready areas became the basis of our portable ecology: writing classrooms that come and go with the teachers and students.

Continuing Transformations

Because of the success of the first two classrooms, and requests from teachers in upper-division writing classes to schedule their classes into our classrooms, we sought and received funding to transform two more classrooms in the main English building in spring 2006. These more spacious laptop-ready rooms offered the same financial advantages as the original rooms, and they would regularly be shared with non-writing-program English classes. From our experience with the original laptop-ready rooms, we knew we could design these spaces so they would be suitable both for computer-intensive writing courses and for literature courses. This round of funding also included a commitment by the college to purchase 30 more laptop computers for our teachers, so that a much larger percentage of writing program faculty could be scheduled to teach in one of the four laptop-ready rooms. At the end of summer 2006, the writing program had gained four flexible, laptop-ready rooms and 41 laptop computers (still a large number of machines, but considerably less than the 104 machines that would have been required to create desktop-based workstations for every student and teacher in the classrooms).

While we are justifiably proud of these changes and the pedagogical opportunities these classrooms afford, we view with a bit of rueful dismay our stumbles and missteps in achieving these renovations. Endowed with the clarity of hindsight, we realize that we were most successful when we inadvertently relied on Bateson's (1972/1987, 1979, 1991) systemically attuned thinking, which privileges the importance of context as a complex web of interdependent relationships. We now realize that this contextual dynamic was central to our efforts to integrate laptop-ready classrooms into our writing program, and nowhere is the horse-plus-plains dynamic more evident than in our inability, even retrospectively, to pinpoint a single starting point for change. Evolution, Bateson argued, begins with the plains *and* the proto-horse, systemically linked so that one changes in response to or in unison with the other. In our situation at Ball State, we found ourselves working in a complex system made up of (at least) existing technology and facilities, a writing program in need of re-tooling and re-focusing, a diverse group of both seasoned and novice teachers, the overarching goals of Ball State as an institution, and an increasingly wired 21st century student population. The multiplicity of our starting points reveals the networked nature of our context and the futility of thinking in terms of isolated areas and goals.

Recognizing the Codependent Points of Entry

One point of entry into our story of change might be the academic year 2004–2005. During that year, the Ball State University writing program instituted a review of the goals and methods of its two required first-year composition classes, a process that had not been undertaken for more than a decade. Shuttling back and forth between the unique needs of the students entering into Ball State and the changing demands of 21st-century literacies, the Writing Committee struggled to set forth a curriculum that would be viable for the next decade.[1] Rather than focusing solely on composing as an art of language, the program would focus on composing as described in different ways by reading educator Peter Smagorinsky (2000) and composition scholar Kathleen Blake Yancey (2004): that is, as a rhetorical act involving multiple modes. The resulting changes to the first-year writing classes—after a full year of meetings, retreats, and subcommittee assignments—were dramatic.

Although Ball State offered about 90% of its first-semester, first-year composition classes in computer classrooms before these changes, it was immediately clear to the committee and writing program faculty that this percentage was no longer sufficient. To meet the new media curricular goals, 100% of classes needed access to technology in the classroom. However, we had already added desktop computers, projectors, screens, printers, and other necessary equipment to every classroom large enough to accommodate such technology, so we did not have the option of creating more desktop computer classrooms. Nor, due to the expense of supporting the necessary desktop hardware, would the institution support such a change. Therefore, instead of the standard technology-enhanced classroom, we decided to move to a laptop-ready set up.

However, if we begin there, we miss a necessary part of the story and bypass the elements that had to be in place to make the curricular change viable. Without the established tradition for teaching composition in computer classrooms at Ball State—without 90% of writing program classes already computer-assisted—the curricular changes would never have gained traction. By 2004–2005, we had momentum already, as some writing faculty were already incorporating new media assignments into the existing composition curriculum. Getting laptop classrooms in summer 2005, then, for us was tied to 1999, when the university instituted a computer literacy component and the writing program assumed responsibility for introducing all incoming first-year students to “computer competency and literacy,” a promise included for the first time in the 2000 undergraduate catalog (Papper, Reynolds, & Rice, 2000). To keep that promise, the English department, through a substantial grant from the State of Indiana, had created the first set of computer classrooms. Between then and now, a continuing series of paid, voluntary workshops, run by and for writing program faculty, has helped equip our teachers to incorporate technology into their teaching in informed and meaningful ways. And thus, many of our Writing Program teachers were inclined to perceive both a portable ecology and new media pedagogy as a normal and necessary outgrowth from our earlier initiative.

But, if we begin with 1999 and the computer literacy component, we are missing yet another starting point of this narrative: the institutional attitude toward technology. Ball State, a mid-sized East Central Indiana university, was named the top wireless campus in the nation by

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[1] Ninety-eight percent of the classes in the first-year composition program are taught by contract faculty, teachers who have annual renewable contracts. Membership on the Writing Committee (WC)—an advisory unit designed to help the Director of the writing program address issues and concerns related to the writing program—reflects that fact. The WC includes four contract faculty members elected at large; three assistants to the Director, each of whom is a member of the contract faculty; the graduate assistant to the Director; and three tenure-track faculty members, excluding the director.

Intel Corporation in 2005. Wireless technology can be used anywhere on campus, and new students are encouraged to take advantage of it. Some programs, notably that of our large Teachers College, have mandated for several years that all incoming first-year students majoring in either elementary or secondary education purchase a laptop computer; BSU's architecture program has more recently followed suit. Ball State is, therefore, a laptop-friendly campus, and initiatives to capitalize on this were popular with administrators, the same administrators who made the decisions so necessary to financing the renovation of conventional classrooms into laptop-ready classrooms.

This profusion of starting points illustrates Bateson's (1991) argument about context. The individual organism—whether grassy plains or horse or writing program—does not evolve, but, rather, the context evolves. Grassy plains and horse evolve coterminously as a result of the impact of one upon the other. The dynamic is not progressive but emergent. We cannot identify a distinct beginning to our story because our story does not *begin*, any more than the modern horse can be said to have simply, one day, succeeded the proto-horse. Instead, our story *emerges* as a continuation of several stories that might—thinking atomistically—be seen as separate, but in fact—thinking holistically—are intrinsically connected. Our uncertainty concerning origins is characteristic of, and essential to, the ecological thinking that we see, in retrospect, characterized our most successful efforts to conceptualize and carry out our project.

Lessons Learned

Given this contextual thinking, how, then, does a Writing program initiate change, especially technological change? With the inevitable confusion of multiple beginnings, how do administrators and teachers know where to begin intervening in the existing ecology? Based on our experiences fumbling through two waves of renovation, we abstract three central tenets from Bateson's complex theory of systemically attuned thinking, and illustrate each of those points with short narratives from our longer, ongoing story:

1. we had to begin thinking of change as a complex web created by transacting loops of information;
2. we had to perceive information in Batesonian terms (as news of difference, or the differences that make a difference); and
3. we had to remind ourselves continually that change was emergent, not progressive; that is, environment and organism jointly interact, and from those interactions context emerges.

Lesson 1: See the Complex Web

For Bateson (1972/1987), an ecology of the mind consists of a complex web or network—"an internally interactive system" (p. 315)—within which no single element has unilateral control over an entire interaction. Rather, control is distributed throughout the whole improvisatory ensemble. Above, we suggested the multiple starting points that we might use for telling our story. We might, for any one of those starting points, identify would-be heroes—people whose influence was, for a time, extremely important to the shaping of our department. However, if we look closely, we find that at no point did we arrive precisely where a hero, or the hero's vision, intended. Instead, every intended end at any point was revised by what, in the throes of a project, felt like competing agendas, lack of resources, and miscommunication. Clearly, no one person could have controlled everything no matter how hard any one of us may have tried. The hero position was distributed across the complex context, and sharing it was essential for responding to unexpected events.

Even as we began to understand the forces at work in our institution—existing infrastructure, university interior design goals, technology budgets, class sizes, student habits, teacher needs, curriculum development, the technology goals of other departments—we learned that we could always be tripped up by what Bateson (1979) called the *stochastic*: random or unexpected events that occur within a set of limitations so that only some components, and not others, endure. Our original laptop classroom proposal nearly died at the department level because of one such stochastic factor. When Kris first presented her plan to our department chair, she learned that, although the College of Sciences and Humanities funds technology requests, it does not fund renovation. Renovation is governed by separate processes, and, though necessary for achieving our technology goals, approval for renovation would require a separate set of efforts. Fortunately, the chair, drawing on his years of institutional experience, thought to approach the vice president of Facilities, Planning, and Management (FPM). He pitched the renovations and gained the promise of funding. That secured, the chair brought the proposal with the technology request to our dean, who committed college funds to securing data projectors for the classrooms and laptops for the teachers.

Obtaining the necessary budget approval required responsiveness to unexpected twists (stochastic twists) in labyrinthine institutional loops—Kris to the chair, chair to VP, back to Kris, back to the chair, to the dean, to Kris. And that brief synopsis hides the twisty loops within the loops (Kris to her assistants, back to Kris, then to the Writing Committee, and so on), and all the unforeseen obstacles we encountered. The conversion of our classrooms—and thus the emergence of our new curriculum and our portable ecology—could have been at any point blocked by the stochastic. Every point in this twisty process required all players to be responsive to constantly emerging forces, sometimes by leading, sometimes by following. We had to become Bateson's (1979) flexible organism because, as he argued, it is not the organism best suited to its environment which survives; the organism which survives is the organism with the most flexible responses to unexpected fluctuations in its complex environment.

Practically speaking, then, the renovation process begins with understanding, as well as we can, the people, processes, and systems that will be affected by our plan and which must, therefore, impinge on the formation of our plan, if our plan is to succeed. We must always be ready to respond to as-yet-unnoticed forces that will affect our plan, and we must always be sensitive to the distributed nature of the hero position. Of course, making a good plan is only the beginning. As we made our way through the renovation process, we learned that voicing our concerns to the right people and having them understood as we intended were two different things. Bateson's (1972/1987) notion of "news of difference" helps us describe both this problem and its solution.

Lesson 2: Understand News of Difference

A complex web coheres as a result of information circulation, and information important enough to circulate is what Bateson (1972/1987) defined as news of difference or "difference which makes a difference" (p. 315). Agents in a system perceive a bit of stimuli as important—as information—on the basis of that which is essential to their survival or their immediate concerns within the system. Thus, an unnoticed stone in the path becomes a difference that makes a difference only when it is needed to anchor a picnic blanket or when it causes a stubbed toe. We recognized the significance of such "stones" when we made the startling (if naïve) discovery that important information in one institutional loop was not necessarily important information in another loop. Along with a number of lesser difficulties, our failure to recognize and account for differences in our complex web resulted, on the first day of fall 2005 classes, in two nicely wired, painted, carpeted classrooms without any furniture for the 25 sections of composition scheduled to meet in them.

The process seemed simple. Having received verbal budget approval, Kris's next task, she was told, was to contact the university interior designer, and she did that in early May 2005. Working with the helpful and innovative designer, she finalized configurations for the two rooms and ordered the necessary furnishings. The designer assured Kris that he would place the work orders for paint, carpet, and wiring. The work to be done, he said, would involve a number of different people, but there would be no one specific project leader. At this point, the importance of different differences began to materialize. First, Kris was oblivious to the fact that the differences guiding the scheduling of FPM work were not always the same differences informing her timeline as Director of the Writing program. For her, "the work orders are in the system" meant that renovations would be completed before the beginning of fall semester so that faculty could acclimate to the new classrooms before teaching in them. For FPM, which juggles a wide array of projects, "the work orders are in the system" meant that the work would be done when it could be conveniently scheduled during the coming fiscal year. Second, Kris did not realize that "no project leader" meant she should connect with each person in charge of the diverse aspects of the renovation: not only the interior designer but also the carpenters and painters, the electricians, computing services, and tech support. The result, eventually, of our un-communicated scheduling "differences" was empty classrooms.

We discovered through our mistakes that we had to both communicate the system of differences significant to the Writing program and discern the system of differences significant to FPM; communication had to flow in every direction. And this was not just a matter of communicating about important timeline issues. The FPM renovators did not think like teachers, and did not necessarily live so closely to the academic schedule as we do, so they were sometimes unable to envision the spaces and equipment in use. For instance, we designed the 2005 classrooms so that students could easily plug their laptops into the campus Ethernet, or so we thought. For tables against the walls, we imagined Ethernet hookups situated above desk level so that students could sit down, reach over, and connect. Simple. FPM, however, installed the hookups below desk-level, because that was the familiar arrangement used in desktop-based computer classrooms. Thus, until FPM could get back to the classrooms and do the work to raise the ports higher, students had to pull the heavy tables away from the walls and reach behind them to plug in their laptops. Conversely, once FPM has done something just the way we want it—as, for example, with the great little equipment cabinets they installed during our 2006 round of renovations—it becomes relatively easy to have them do that same thing again. They understand what we mean because they have a working model for it.

Having learned so much in 2005 about the need to communicate differences, in 2006 we were more intentional about bringing the FPM renovators into our "teacher thinking" loop. Among the important changes affecting our second round of renovations was Fred's appointment as Laptop Classroom Coordinator. His job during the renovation process was, in essence, to continually communicate about how these classrooms would be used and to work to ensure that the new classrooms would be ready before the start of school. He materially emphasized both crucial differences—teacherly design and schedule—by holding meetings in the classrooms themselves. The physical space of the rooms, emptied of furniture and filled with the mess of renovation, emphasized on a visceral level the importance of scheduling tasks so that the rooms would be prepped for teachers and students by August, and it helped all involved to communicate—sometimes by pointing and gesturing—about the ways that the technology was meant to work.

Our persistent, intentional communication with other units throughout the university helped them to understand our crucial news of difference and to serve our needs better. However, that is only part of the difference equation. We also learned to listen to and for their differences. Their communication with us—the news of difference we received—helped us to better plan for potential catastrophes, and, by anticipating them, prepare to cope more easily with them. Even with committed support from the various involved units, the more we learned about the process, the more we understood how many things could cause delays and leave us with unfinished classrooms at the start of school. One key difference that would always make a difference: new equipment for our classrooms could not be ordered until the start of the new fiscal year (July 1), and, at that time, the folks doing the purchasing are overwhelmed with requests. Another key difference: the major computer manufacturer through which BSU purchases computers would receive a massive order from the university at the start of the fiscal year, and it would take them some time to fill the whole order. What these sorts of issues meant for us—the real news of difference we needed to absorb—was that we had to have a backup plan for the first few weeks of classes in fall semester because any major snag in the purchasing, shipping, and installation process could cost us crucial weeks of delay.

The 2006 renovations were completed before the start of school—barely—but, had they not been done, we had alternative arrangements in place, with classrooms selected and both teachers and support staff informed of the potential problems. Instead of resisting the ecology of the university, we learned its rhythms, adjusted our expectations, and began to co-exist more peacefully. We had, in essence, learned to understand the news of difference. And we were most successful within this labyrinthine flow of differences when we treated change as emergent rather than linear. This, too, was a lesson we had to learn.

Lesson 3: Emerge into Change

What happens when we imagine the complex web as dynamic rather than stable, and recognize its complexity extending forward through time? The metanarrative of Darwinian evolution, like many 19th-century stories of progress, posits (in its simplest form) sure, linear movement toward higher and more perfected states of development, with the kind of orderliness suggested by that often-parodied monkey-becomes-man illustration, each successive stage supplanting and improving on the previous. Bateson (1979), however, insisted that evolution must be understood as a circular or recursive process, in which new ecological situations constantly emerge but cannot at any time be characterized uniformly as progress, because an improvement in one place may lead to complications in other places. Any emerging change must lead to re-evaluation of all previous changes. Some agent in the ecosystem evolves into a form in which it can better defend itself or meet its needs. But the rest of the ecosystem is not stable; other agents are also changing, maybe in response to independent factors, maybe in response to the first agent's new situation. And the form that served an evolving species (or technology) will at one time may, as the rest of the ecosystem changes, become untenable, or even disastrous (think of the T. Rex or, in terms of technology, the 8-track tape).

There is no perfectly stable ecosystem under ordinary circumstances. Nor is there any stable institutional ecology for writing programs, because the complex web is constantly reshaping itself over time, emerging in new and different forms. Program change is equally emergent in two ways: one, it is lodged within a material situation, and, two, that material situation coheres in a complex web of interdependencies. As with so many of the actions we describe in this chapter, we arrived at this insight into emergence by accident.

The architect Peter Blake (1977) highlighted the importance of the material situation to emergent change. Toying with the Modernist idea that, in building and planning, form should follow function, Blake suggested that, in fact, in any practical development, form will tend to follow *fiasco*. Like Bateson's (1979) discussion of the way change emerges from the situation that exists, rather than resulting from steady, linear progress, Blake pointed out that, in practical, lived systems, one cannot typically bulldoze the terrain and start anew, making way for the establishment of an utterly alien ecology. Instead, one must fit into what exists, let new projects emerge naturally from the present ecology, and accept stochastic disruptions (even outright fiascoes) as a natural, expected part of the system moving forward. This is exactly the material dynamic characterizing our renovations. Helpfully, our laptop-classroom gambit was made viable by the increasing number of students carrying laptops, and their carrying of laptops was encouraged by Ball State's decision to make wireless Internet access ubiquitous on campus. Though no one involved in the ubiquitous wireless decision would have given any thought to it, the change they made affected the later change we made. Not so helpfully, one of the major "fiascos" plaguing our efforts to acquire a portable ecology arose from long-past architectural decisions that made our classrooms only large enough to contain tables for 25 students and a teacher desk. What our department, in a past ecological state, rightly perceived as improvement (classrooms designed to the size needed at the time) had become an inflexible barrier to further change.[2] A continually emerging ecology never reaches equilibrium, and the material situation at which we are arriving will always be formed, in part, by our co-emergence with material constraints and unexpected disruptions. (See Figure 2 and its associated movie; .mov format, 14 megs for several models of change.

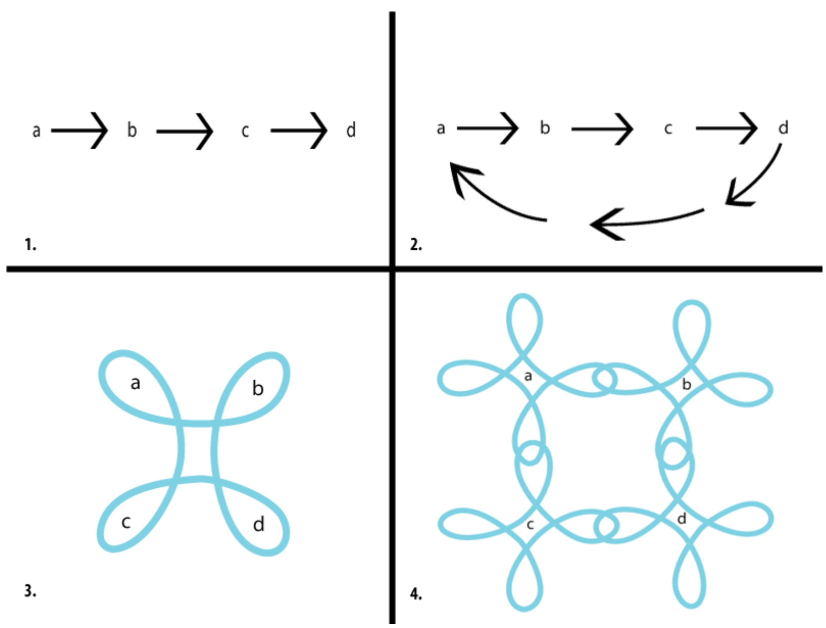

Figure 2. Models of change.
[Click for a short presentation further exploring these models.]

[2] The size of the rooms and the number of desktop computers in our traditional computer classrooms helped physically constrain the first-year composition cap. But that move also limited our technological options in two ways. First, many spaces were too small for desktop computers for 25 students. Second, all spaces restricted the design of our laptop-ready classrooms. Our move toward laptop-ready classrooms was thus shaped by those earlier decisions.

A second aspect of emergence important to our project was the discovery that any material situation is constituted out of a complex series of co-evolving interdependencies and that change emerges out of those interdependencies. Thus, emergent change cannot be approached progressively or as a series of discrete sequential moves, which is exactly how Kris initially conceptualized the 2005 project. Like any good Newtonian, Kris began the 2005 renovation process thinking—with what she saw as goal-directed efficiency, in clear-cut, cause–effect linear terms—we do this first, then this second, then this third, and so forth, until we reach a final, set teaching situation in every classroom (see Figure 2, box 1). But, as we have described above, this logical, clean, and controllable way of progressing was quickly scuttled at the department level by an unexpected twist: the college could not fund renovation. That required the approval of Facilities, Planning, and Management. As we have said above, the introduction of FPM altered the scope of the renovations. The goal—the vision of the end—thus emerged in response to these unexpected interactions. Through this fortunate scuttling we realized that change results from—evolves from—the interdependencies of the existing situation, and that results are not necessarily what were foreseen at the beginning of the endeavor. We were forced to think of change as a kind of circular process, rather than a linear process (Figure 2, box 2). We would not just complete the steps, go through the various offices and be done. Any one of those offices could send us back to the start and make us revisit our plan. As we continued the process of changing our classrooms, we saw that what seemed to be discrete offices were actually tightly knitted together, part of a looping web where information travels around in various directions (Figure 2, box 3). What happened in one of those offices would affect the others and our interactions with the others. When we widened our view, we began to see that each office was already part of its own web with its own stakeholders and twisty paths of change (Figure 2, box 4).

Thus, although writing program directors, writing center directors, and coordinators might set goals marked by distinct ideas about where a program and its constellation of units ought to be headed, we found it wise, at the same time, to emerge gradually—and constantly—into change, taking one small, responsive, tentative step at a time, rather than pushing for radical change all at once. This way, our master plan could be altered in response to the push-and-pull of the stochastic. This emergent pattern continued as the project was completed and teachers began to use our reconfigured classrooms. Our serendipitous fall into emergence led us to recognize that working out the technology situation in our laptop classrooms had offered compact solutions with future consequences. And we were ethically bound to address those future consequences. Merely gaining our portable ecology was not enough. We had to consider how to support—how to sustain—the new portable ecology.

SUSTAINING A PORTABLE ECOLOGY

Acquiring space and technology is only part of our Batesonian inflected story, only a part of systemically attuned thinking. Using the space and technology in ways that serve curricular goals—that is, sustaining the portable ecology—is an ongoing, constantly emerging challenge as well. Hardware, software, and technology-rich spaces are not demands or orders that must be followed; rather, they are invitations that must be kept open. As Johndan Johnson-Eilola (2005) pointed out, technology does not dictate to or shape its users; rather, users, within a certain set of affordances, use the technology to enact their own agendas, or their lack of agendas. Thus, providing these laptop-ready classrooms—the environment—did not ensure that the new media pedagogy would survive as we envisioned. What was necessary to sustain our portable ecology was to provide support within the larger context of the Writing program. In fact, Bateson (1991) would argue that this was a moral imperative: “to try to alter any variable in a homeostatic system without awareness of the supporting homeostasis must always be shortsighted and perhaps immoral" (p. 254).[3]

Once created, the laptop classrooms needed to be inhabited by students and teachers committed to and informed about new media composition. Bateson (1972/1987) noted that ecologies can survive—for some period of time, at least—with relative constancy. This sort of survival of a larger system is maintained by changes in the constituent subsystems. The relative constancy—the survival—of the relationship between animals and grass is maintained by changes in both relata. But any adaptive change in either of the relata, if uncorrected by some change in the other, will always jeopardize the relationship between them.

To support the technological adaptations we made to create our portable ecology, we also had to make analogous changes in the several other "constituent subsystems" affected by the curricular changes. Wanting our portable ecology to survive (and thrive), we knew we had to have the commitment of Writing program faculty and students. So we tried to gain this cooperation by changing the types of support we offered them, both by creating a Laptop Classroom Coordinator and by designing a Writing Center that could foster student functional and rhetorical literacies.

Supporting Teachers: Emerging into Laptop Classrooms

Funded out of the Writing program budget, the Laptop Classroom Coordinator was charged both with addressing technological fiascoes in our new and developing classrooms and with helping the Writing program faculty adapt to their new environment. Fred, who began doing this work as the first Laptop Classroom Coordinator, saw the position evolve into Writing program Assistant Director for Technology, and when, in summer 2008, he resigned from the position, the department saw fit to appoint a replacement, signaling the demonstrated importance of this role. In his support efforts, Fred was guided by the dictum of flexibility: How could our new facilities and equipment be adapted to serve the teaching styles and needs of the most possible teachers?

Steve Jobs (1990), Apple's CEO, famously suggested that a good computer should be a "bicycle for our minds," amplifying our mental efforts the way a bicycle amplifies the physical efforts of its rider. That metaphor vividly suggests the importance of ecological thinking for administrators putting technology in the hands of teachers. Will the technology amplify the efforts of these teachers? Or will it get in the way? Will it sustain what is working and valuable in their present teaching, or will it require them to create a new teaching style (and abruptly abandon the old)? Will the effort required to learn the technology pay off in practical teaching benefits? And if the technology does amplify the efforts of teachers, how will that amplification

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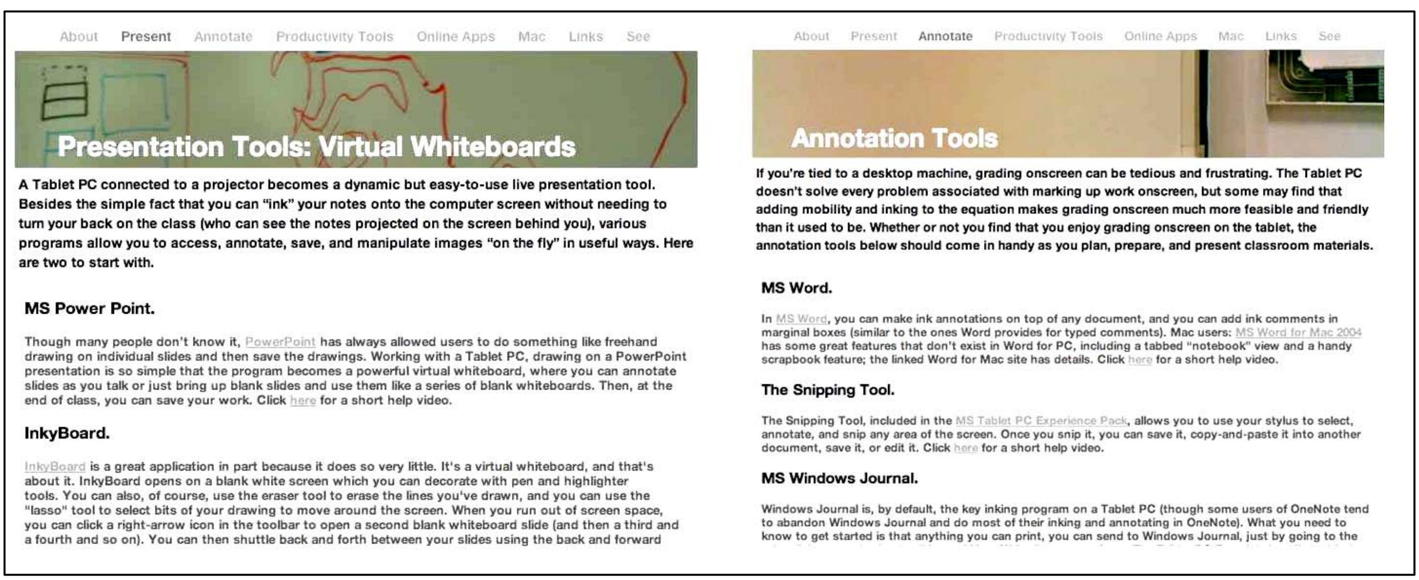
[3] Reynolds (1998) also implies a moral imperative in considering the material conditions for non-tenure-track faculty. She suggests that "given the complexity of trying to make concrete or measurable changes, it seems one way to improve the status of non-tenure track faculty in composition is to examine closely the spaces in which we ask them to work, the condition of those spaces, and the assumptions about time and space that control workers' daily environments" (p. 31). First-year writing at Ball State is predominantly taught by non-tenure-track faculty, who, up until the laptop classroom renovations, were allotted one, often old, desktop computer per office (two faculty members per office). The laptop classroom renovations allowed us to get new computers to writing program faculty that they could use in their offices, classrooms, or homes.

change the work they do? As teachers ourselves, we knew from the start that our decisions had to be governed not by what teachers in the department *might* do with technology and teaching spaces but, instead, by what they most likely *would* do with technology and teaching spaces, given not only the natural limits on their time and energy but also their individual preferences as teachers. We needed to make sure that our new laptop-ready rooms, though novel, would feel like a naturally emerging development in the ecology of our program, rather than a sudden, terrain-wrecking cataclysm, and we hoped, also, that our solutions might help teachers in our program to emerge—gradually and naturally—from the present ecology as they discovered unanticipated ways to make use of our portable ecology.

In addition to trying to make initial equipment choices that would both sustain our current teaching and encourage emergence into new teaching paradigms, Fred began a series of efforts to spread news of teaching with laptops. He took advantage of our Writing program's existing series of faculty workshops and its annual orientation, which for years have been our most effective means for creating colleague-to-colleague interaction and information exchange, supporting, for example, our earlier move to the Blackboard course-management system and our push to have every writing program faculty member create a course Web site. Fred also stayed in contact with our pool of laptop classroom teachers through emails addressing both practical issues—like how to manage mundane computer maintenance—and general news about laptops and education. All of those emails were archived at a blog, where they could easily be accessed, and their occasional appearance served as a reminder (another bit of news of difference) that the Writing program was committed to supporting the laptop classrooms and the teachers making use of them. Fred also set up a help Web site using much the same philosophy we had used in our convertible notebook decision (see Figures 3a and 3b; Johnson, 2006). Tabs across the top of the page linked to various kinds of help information, with the tabs to the left linking to information about the most basic convertible notebook applications (e.g., for inking and annotation), and tabs further to the right suggesting less traditional applications with laptop classroom potential. Those who wanted to experiment and innovate could choose to learn more; those not interested in innovating did not have to dig deep until or unless they wanted to do so.



Figures 3a and 3b. Screen captures of Fred's original help site.

Sustaining our portable ecology has triggered compensatory changes both in our portable ecology itself and in our older desktop classrooms. Fred saw that a natural next move would be to make laptop hookups available in all of our traditional desktop computer-based classrooms. Such a move would both amplify the usefulness of all our new laptops and allow faculty members to have a more consistent teaching experience from classroom to classroom. When Fred investigated the possibilities, he discovered that nearly all of our classrooms already contained hookups for laptops, but installed in such a way that few realized the hookups were there and, even for those who knew, plugging in meant coping with a bewildering snarl of cables. This situation was, certainly, another instance where news of difference had not been spread, resulting in faculty members not knowing what the classrooms could do and that the folks maintaining the classrooms did not know about the practical difficulties that made their upgrades useless for the many teachers who had only a few seconds to spare for wrangling with technology at the start of class. Here, sustainability relies on news of difference flowing inside the department, outside, and in between. And sustainability relies on constantly looking for the next small, logical step, so that—in the context of the complex web—there is continual feedback, clarification, and course correction. Without this flow of information, the ecology cannot be sustained.

Moving forward, we have begun the process of rebuilding our teacher stations for quick, hassle-free laptop access and for greater ease of use in general. We have also begun to plan the addition of laptop hookups for teachers in all of our departmental classrooms, even the ones that will not be converted into fully laptop-ready spaces with plugs and ports for every student. These other classroom spaces were designed in the 1980s for classes of no more than 30 students, and there is no room for a typical computer teacher station in them, something that has made their ecology seem unchangeable for years. But our experiments with laptop classrooms have taught us to successfully incorporate projectors, video players, document cameras, and laptop hookups in small spaces; now we have a sensible, natural, low-budget way to give these rooms an upgrade. That upgrade will allow teachers to employ technology without lugging equipment from floor-to-floor, and, once again, it will amplify the usefulness of our present pool of teacher laptops. It will no doubt take several years, moving in small steps, to add technology to every teaching space in the department, but slow, steady, significant progress is good. It gives us a chance to adjust our focus between bouts of renovation, tweaking our designs and responding to the responses of our teachers as one adjustment or innovation leads naturally to another.

Supporting Students: Toward Functional, Rhetorical, and Critical Literacy

Although we recognized that first-year writing curriculum should evolve as time goes on, we did want our focus on new media composing to survive with relative constancy for at least a few years. However, as soon as we began to discuss new media composing with Writing program faculty at Writing Committee meetings, different faculty members voiced two primary concerns about students. First, students, they worried, would not have or know how to use the technology necessary to create new media texts. And, second, teachers feared that students would not understand that composing in new media was something significantly different than sticking a picture into an otherwise “regular” paper. In other words, students needed support understanding the capabilities of technology—a functional literacy—and needed to understand when and why to compose in new media—a rhetorical and critical literacy (Selber, 2004). These were valid concerns based on the changes we were asking teachers and students to make, concerns we had to address if we hoped to have the curriculum enacted in the classroom.

One way that we help students with their technology questions is by teaching their Writing program teachers how to tap into the various sites of support available on campus—its own complex web. For example, through Computing Services, Ball State students can get help with their user accounts, set up Web space, get secure server space, and make appointments for one-on-one help with their computers through a service called TechTime. Online, students can get help through Web-based tutorials, product and program manuals, tip sheets, and email advice. Additionally, because all education students must purchase Apple computers, there is an Apple help desk located in the Teachers College to troubleshoot Apple hardware and software issues. The university also has a number of corporate partnerships that permit students to purchase computers and peripherals at a discount and to obtain low-cost (or no cost) software. Currently, for instance, students and faculty can download the latest version of Microsoft Office for free. Further, the library has become a leader in supporting technology use by having top-of-the-line computers loaded with cutting-edge software for designing texts or Web sites, by giving students access to color laser printing for a small fee, and by providing training and support services, with workshops on various software programs and tailor-made workshops for classes.

Practically speaking, this means that instructors in laptop classrooms do not have to know how to solve every software or hardware problem for each student, and it means that the Writing program does not have to require that all students use the same kind of machines as their teachers. Faculty can direct students to the help already available within the university ecology. Additionally, having corporate agreements means that faculty can require students to have Microsoft Office, for instance, knowing that it will not place a financial burden on students. Finally, many faculty take advantage of technology training workshops by having an expert walk students through a digital movie application or podcasting tool; occasionally, faculty require students to work through Web-based tutorials outside of class time. Without this range of resources available to support students, it would be quite difficult for teachers to sustain the new media curriculum, because students would lack basic understanding of the tools at their disposal.

The second concern that faculty had involves what Selber (2004) called rhetorical literacy: knowing enough to be critical about when to use what technology. The concerns of rhetorical literacy are not necessarily addressed in the functional literacy outlets just mentioned. For example, during one class, a trainer came to show students how to use Microsoft Publisher. The trainer walked students through a number of types of documents (flyers, brochures, and so forth) and had students create practice documents using Publisher’s built-in template collection. The trainer did not talk with students about making rhetorical choices among types of texts or the implications of making such choices; she talked in terms of shortcuts and expediency. In other words, the trainers are quite good at showing students how to use a program, but not as effective at helping students decide when to use which program or which features in a program to meet a particular rhetorical end.

Writing program faculty were astute in realizing that students needed readers who could respond to multimodal writing outside of the classroom, too. Luckily, through its own twisting path towards transformation, the Writing Center co-emerged as a site of support for composition students working on new media writing. Back in 2003, Jackie was hired as the first tenure-line faculty director of the Writing Center. One of Jackie’s first objectives was to get the Center equipped with reliable, current technologies to improve recordkeeping and tutoring capabilities. With Kris, she composed a formal computer request for both hardware and software that would improve the pedagogical and administrative work in the Writing Center. The request included new computers with large monitors for on-screen tutoring, software to replace the paper and pencil databases and appointment books, and software to create and maintain an improved Writing Center Web site. After a few small setbacks and, of course, delays, the Writing Center was granted over $10,000 in hardware and software.

In 2004, once the technology was in place, Jackie began to train tutors to work with students on multimodal texts. This training, similar to the workshops later offered to the Writing program faculty, taught tutors to talk with students about rhetorical issues of design. In particular, tutors were taught elements of design from the ever-useful *Non-Designer's Design Book* (Williams, 1994) and learned how multiple modes can be combined to different effects based on Karen Schriver's (1997) schema in *Dynamics in Document Design*. Tutors practiced offering feedback to texts written in multiple modes, which required them to learn to "read" the other modes at work. Tutors also practiced giving recommendations on texts written primarily in one mode (e.g., written) or medium (e.g., paper) where an idea might be better expressed incorporating a visual element (e.g., image, graph, timeline) or using a different medium. Months later, when proposed writing program changes had faculty buzzing with anxiety about teaching new media composing, we were able to assure instructors that the Writing Center staff was trained and the center was equipped to help their students—a fortunate moment of co-emergence.

Some scholars in Writing Center work, most notably Michael Pemberton (2003), suggest that writing centers might focus on what they know best (old media) and leave new media to someone else. But having a Writing Center that works rhetorically with new media texts is important for the campus community and especially important in helping sustain the new media curriculum in Ball State's writing program. As an added plus, the transformation of the Writing Center from a place that worked only in pencil and paper, only on traditional "papers," to a Center that works on-screen and online allowed it to further integrate itself into the ecology of writing at Ball State. Whereas the Writing Center was once a bit distant from the writing program—the Writing Center director was not on the Writing Committee, the Writing Center did not get technology upgrades along with the writing classrooms—the Writing Center is now richly connected to the writing program. Its connections to the writing program mission are now more apparent to all parties, which gives the Writing Center a better position to work from for its continual evolution.

DEUTERO-LEARNING: THE CONTEXT OF CONTEXTS

An organism in its environment is, by nature, unique, operating by its own set of rules to survive and adapt to its environment. However, Bateson (1972/1987) argued that what organisms learn to do or be in one context to survive can also apply in other contexts. He claimed that we suss out the "rules" that guide behavior in a particular situation and act in response to those discoveries to survive, if not flourish, in that situation. An experimental subject, Bateson pointed out, "not only solves the problems set him by the experimenter, where each solving is a piece of simple learning; but, more than this, he becomes more and more skilled in the solving of problems" (p. 166). He coined the term *deutero-learning* to refer to learning not in a context but, instead, *about* contexts.[4] On the basis of one classroom, students begin to extend those lessons—they generalize—about all classrooms.[5]

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4 Likewise, Norgaard (2004) noted that although we participate in the fiction of a "fresh" classroom each time we begin a new semester, "the classroom has, beneath its surface, vertical strata of institutional and pedagogical sedimentation and horizontal networks of connections that remember for us, that structure teaching and learning even as we hold dear to the fiction that we teach and learn afresh" (p. 155).

5 Bateson (1972/1987) also revised deutero-learning to *trito-learning*: "the changes whereby an individual comes to expect his world to be structured in one way rather than another" (p. 249). First-level learning is perception of and response to a signal (such as a student's recognition of a teacher's call for attention); second-level learning is response to a kind of

We end this chapter with a bit of deutero-learning, extending to other contexts the ecological thinking that helped us in our goals. We offer three suggestions for thinking about technological change in a writing program that addresses from various perspectives the intertwining loops of technological change, institutional dynamics, and writing program pedagogy.

First, **think spatially**. Michel Foucault (1986) noted that

> we are in the epoch of juxtaposition, the epoch of the near and far, of the side-by-side, of the dispersed. We are at a moment, I believe, when our experience of the world is less that of a long life developing through time than that of a network that connects points and intersects with its own skein. (p. 22)

Because any change is situated within a complex web, innovators have to think in terms of a network, and this kind of thinking is important both for getting a change approved and for supporting that change once it has been effected. For instance, thinking spatially is absolutely essential to herding a change through the institutional body. It is not enough to think in terms of “two classrooms for the writing program” and “two more classrooms for the writing program”; that kind of thinking left us in fall 2005 with two unfurnished classrooms and more than 25 sections of composition to relocate. Instead, change requires the simultaneous activities of individuals and institutional units spread throughout the campus. Those units become a network as they work together and exchange information, and they will exist as an ecology only as long as they remain united by that flow of information. In addition, supporting change requires the same spatial thinking; it cannot be limited solely to two or four new classrooms, but, rather, requires a change in the spatial web of classrooms. Change must be diffused throughout the entire array of constitutive loops, or it can neither emerge nor be sustained. To be viable, the ecology must be perceived as a network of interdependent processes.

Second, **think rhetorically**. The discovery we made about the importance of information as differences that make a difference led us to reaffirm the importance of thinking rhetorically throughout the entire process. As scholars trained in rhetoric, we acknowledge that this dictum is ostensibly self-evident. Kris, Jackie, and Fred each knew that effecting change through language relies on the rhetor’s sensitivity to the agendas of diverse audiences in their particular situations. It was a crucial component in Kris’s draft of the original technology proposal. But thinking rhetorically is important not just for eliciting change but also for effecting change. This was Kris’s discovery in her 2005 efforts; she had to consider the existence of diverse audiences and the particularities of their unique situations in rhetorical terms. She had to learn how to think like her audiences and simultaneously devise strategies to help her audiences think like writing teachers. In addition, thinking rhetorically bound us to the ethical implications of our rhetorical actions. By bringing about change, we were responsible for the consequences of those changes because we, too, were part of the ecology of that change. We were organisms in the environment who would be altered by our own renovations. Therefore, we had to commit ourselves to ensuring not only the health of the portable ecology but also the health of the larger matrix from which that ecology emerged.

Third, **think temporally**. A temporal attitude has two aspects: the *when* of change and the *how* of change. The rhetorical concept of *kairos* helps us with the when of change; *kairos*, or

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activity (such as a student’s response to a teacher’s request to memorize a list of prepositions); third-level learning results when students derive a generalization based on a category of activities (for instance, the belief that learning consists of memorization). Bateson also held out the hope for fourth-level learning: learning to change the generalizations that structure one’s expectations and behaviors.

timeliness—choosing the right moment for speaking to an issue—requires that we consider change as always already embedded in a complex web. The kairotic moments of change are dependent on the dynamic interactions of participants in that web. Those interactions continually realign, and the possibility of change is linked to—indeed, arises out of—those alignments. Thus, as *kairos* teaches us, we must be timely; we must recognize the best moment to jump. In addition to recognizing such moments, the dictum of timeliness implicates the *how* of change. As Bateson (1979) warned us, “what is good for a short time (the symptomatic cure) may be addictive or lethal over long time” (p. 148). Emergent change requires us to think temporally along a short- and long-term continuum, both in terms of the immediate goals for renovation and the long-term results of that renovation. A key element of emergent change is the potential for small changes to have large effects. So it is incumbent upon renovators to think of time as folding back on itself. For example, the first renovation, a small change, really, in the ecology of the English department and seemingly isolated to the writing program, initiated a minor tsunami of change, for literature folks using archaic portable technology (i.e., a tech cart that they dragged from classroom to classroom, frequently between floors) have embraced the idea of just such portability. They were integrated into the 2006 innovations in such a way that the classrooms no longer are perceived as writing program spaces but as English department spaces, a shift in perception that also has consequences for the university technology initiative. Small changes have large consequences.

Bateson (1979) argued that change must “fit the organism’s [here, the writing program’s] internal demands for coherence, and it must fit the external requirements of environment” (p. 144), because change is always about relationships. Thus, the suggestions and the stories we offer do not dictate particular steps to initiate and follow. Instead, they provide an entry point into contextual thinking, into a double requirement of coherence and flexibility. Based on our experiences with transforming classrooms, writing program pedagogy, and writing center protocols, we found such thinking essential to gaining and sustaining our portable ecology. Contextual thinking implicates not only what we might envision as a viable change but also what strategies we might employ to achieve (and carry out) that change. Bateson cautioned us that if we wish to live in a sustainable natural environment—if we wish to survive as a species without destroying the physical world that supports that survival—then we need to think in this new ecological way. The three of us believe that this orientation is also crucial to the evolution and sustainability of a new media rich, technologically oriented writing program.

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A Portable Ecology: Supporting New Media Writing and Laptop-Ready Pedagogy

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"ABOUT THOSE LOOPS" TRANSCRIPT

This short presentation, called "About Those Loops," is designed to further explain a metaphor that we developed as we wrote to help ourselves imagine the complex relationships at work at any institutional change process. We suggest in our metaphor that change happens in a series of transacting, overlapping loops within loops.

In the beginning, there were no loops in our thinking. Instead, we assumed that as one pursues change in an institutional setting, there is a linear chain of command or series of events to follow, and that if we simply followed that chain, link, link, link, we would achieve our goals. So, for example, the writing program administrator, in consultation with the department, develops a plan for classroom change. That plan is sent along to the dean or to whatever person or office can approve changes. And if the plan is approved, work is done. Work orders go in, whatever that means, and just like that—A, B, C, D—transformed classrooms appear.

What we learned is that this is a little like thinking that somewhere along the way a miracle occurs, because a lot of complicated things happen between the dean's approval and the transformation of the classroom. Our paradigm didn't offer us adequate ways to think about the complexity of the process.

Gregory Bateson's (1972/1987, 1979, 1991) model of evolutionary change is a more appropriate way to think about institutional change. Bateson's argument, in short, is that the linear model of evolutionary change—where an organism continually evolves into more and more perfect forms—is wrong. Instead, Batson explained evolution as a complex process involving an entire ecosystem of independent actors.

Bateson illustrated this point by talking about the complex origins of the modern horse. The horse that it exists as it does has evolved into the form best suited to thrive on the grassy plains where it lives. But we could also say that the plain exists as it does because, over time, the plain has responded to horses living on it. Certain plants have thrived; others have not. The soil has been beaten down and fertilized in different ways by evolving horses. Some predators have been attracted, others have been fended off, and so on. This means not only that evolution is a process of mutual change and accommodation, but also that evolution is not necessarily progress toward better forms, just emergence into different forms. As we write in "A Portable Ecology," what appears to be an improvement in one place in the system may lead to complications in other places. Some agent in the system evolves into a form in which it can better defend itself or better meet its needs. But the rest of the ecosystem is not stable; other agents are also changing, maybe in response to independent factors, maybe in response to that first agents' new situation. And so the form that served an evolving species well at one time, or the form that served an evolving technology well at one time, may, as the rest of the ecosystem changes, become untenable, or even disastrous. Think of the T-Rex here, or, in terms of technology, think of the 8-track tape.

As rhetoricians, this is a pretty natural way for us to think, comparable in a lot of ways to the good old feedback loop. Here you see my standard classroom slide illustrating the parts of the feedback loop, and it's easy to imagine the WPA sending a message to the dean, the dean prompting the WPA to clarify the message, and, eventually, the achievement of clearer communication, and so on. But a single feedback loop with only two agents in it hardly represents the complexity of institutional communication. When Bateson talked about the horse and the grassy plain, he suggested not that the horse is in a system with the single entity called "grassy plain," but that the horse is in a complex ecosystem full of all of the many organisms in, under, and around the plain.

Our university ecosystem was similarly complex. The problem was not just to clarify communication with the dean. The more we learned, the more people and units we saw were important to the renovation process. There was the Facilities, Planning, and Management office, and, under that umbrella, there were the folks overseeing architecture, interior design, carpentry, wiring, and so on. There were the technology people managing both classrooms and university-wide computing, and they were constantly balancing projects and requests all over campus. Just within the department, there were different faculty groups with different priorities and needs, and at the university level, there were overarching administrative goals and priorities that could affect not only if our projects were approved, but also when and how they were completed.

And so, we began trying to understand the loops within loops situation. We were thinking in terms of dyads (e.g., the WPA and the dean). But, of course, the dean's decisions are being affected by any number of other agents he interacts with at the university. Just for instance, the dean is interacting with the university president, whose opinions will affect his actions, and moving out to the next set of loops, the president is interacting with the board of trustees, who are affecting her outlook. But that's still too linear; the dean isn't interacting only with the president. There is also his relationship to the instructional technology folks, to the various units, to the other deans on campus. And all those people have independent relationships, too—loops within loops.

We can also think about all of the complex relationships affecting just the formation of writing program goals. We've already been talking about the relationship to the dean, which is often mediated by the relationship to the department chair. Beyond the dean, there is university administration. But this is just one direction we can look. There is also a relationship to the instructional technology people, concerned with questions about whether our goals fit with their goals for the whole university and questions about whether our plans make sense to them in general. There's a relationship to facilities. Do they see our building in need of renovation? Is there time, money, and reason to make our project a priority?

We have to keep students in mind—what they expect and what they bring. In our case, the fact that students and their parents had begun to see laptops as a must-have for school was central to our laptop classroom scheme. Teachers, too, obviously, have to be considered. Are we making their jobs easier? Will they accept or even like the changes we're proposing? And the office staff can be affected. What new things will they need to do to help us get laptops to teachers and manage teaching assignments in these new spaces.

Finally, there's our relationship to the existing spaces. What are the rules for changing them? Can they be made to work as we want them to work. Between all these concerns, there are other relationships, other links, so that at every level, in every direction, we encounter the same kind of complexity that we already saw in the dean relationship. Loops within loops, relationships within relationships, all affecting the formation and then execution of writing program plans.

So what we finally learned is that we were not dealing with just a dyad or with a linear chain of command, but, instead, with a set of relationships, and then with a set of relationships beyond them, branching out in every direction with increasing and sometimes bewildering complexity.

We started with the notion that getting things done on campus was an A, B, C, D procedure—a command-and-achieve model where change results from a predictable linear process. We soon learned that the process had to be recursive somehow, involving planning, and then re-planning based on feedback. But since every stop on that A, B, C, D journey involves its own loop, a simple feedback model only begins to demonstrate the complex ecology of communication and action of which we were part.

It's not just about us and the things happening in our little feedback loop. We finally learned that each office we interacted with should be seen as already a part of its own complex web, full of its own stakeholders, its own interactions and communications, and its own twisty pathways to change. Every loop has its own loops, has its own loops, has its own loops. Complexity exists at every stage. There's both the complex horse and the complex grassy plain, and you have to think in terms of the whole ecosystem.

We, of course, have some big ideas about how to manage all that complexity and all those loops. We write at length about those ideas in "A Portable Ecology: Supporting New Media Writing and Laptop-Ready Pedagogy."

CHAPTER	3
TITLE	Stifling Innovation: The Impact of Resource-poor Techno-ecologies on Student Technology Use
AUTHORS	Anthony T. Atkins Colleen A. Reilly
OVERVIEW	Our chapter reports on survey research we conducted to determine the effects that the resource-poor techno-ecology in which we work and teach has on student learning experiences and perceptions of themselves as users of computer technologies and designers of new media texts. Through a survey of 98 students in our professional writing courses, we gained insight into student access to and perceptions of their abilities to successfully use writing and communication technologies. We also learned about their awareness of the extraordinary measures that their teachers use to gain access to technologies for teaching and learning. Through this survey research, we discovered that students in our resource-poor techno-ecology do not perceive themselves as qualified for the most technologically intensive careers related to professional writing. Additionally, students reported a significant amount of apprehension when using technologies and fear of making irreversible errors. Scholars indicate that experience using technologies in classroom settings is key to fostering confidence and desire to learn in students, particularly female students. Because our techno-ecology is resource-poor, our students have uneven experiences using technologies for course projects; further, innovations are often unsustainable—that is, not easily transferred from section to section or faculty to faculty due to the extraordinary efforts often required to access technologies for classroom use. We present our methodology and results in part to provide a process potentially useful for other faculty in investigating their local techno-ecologies.
TAGS	access*, administration, Anthony Atkins, barrier*, classroom, Colleen Reilly, communication, computer*, ecology, equipment, faculty, funding, grant*, hardware, innovation, integration, IT, lab, learning, pedagogy, professional writing, resource*, software, student, survey, sustain*, teacher, techno-ecology, technolog*, UNCW, unified theory of acceptance and use of technology, University of North Carolina at Wilmington, UTAUT
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Stifling Innovation: The Impact of Resource-poor Techno-ecologies on Student Technology Use

Anthony T. Atkins
Colleen A. Reilly

We begin with an all-too-familiar story in which our hero, attempting to teach multimedia writing in a professional writing senior seminar, must contend with his department's outdated digital video camera and lack of video-editing software and workstations. As he has each semester since instituting this project, he trots off to the grocery store to pick up dark chocolates, toaster pastries, cookies, and other treats to keep in his office and distribute to a variety of staff members in information technology departments, at the library circulation desk, and, of course, within the Technology Assistance Center (TAC)—all of whom control, in one way or another, the technology he and his students need. Prior to beginning a new multimedia assignment, he approaches the library circulation desk and requests a digital video camera—a hot item in the library—and finds it, inevitably, already checked out.

Understanding the situation, he leaves a bag of dark chocolates for the staff and thanks them profusely for checking for him. Returning to his office, he ponders where he will go next to find access to the digital video camera he needs to teach his classes. He arrives at his office to find a message from the library stating that someone has returned the digital video camera and that he may come and pick it up. This time, through his personal charm and gastronomically enhanced people skills, he is saved, yet he still feels tired because he knows that he will have to use this and other unorthodox strategies to gain access to a number of technological teaching tools throughout the semester. Furthermore, while he is our current hero, he is not the only faculty member in the department or on the campus who uses such strategies to gain access to digital technologies. Other faculty members who teach advanced professional writing courses, for instance, could and do share similar experiences and use similar strategies for coping with a resource-poor techno-ecology.

The extraordinary measures taken by faculty who want to assign technology-rich projects and attempt innovative digital pedagogies may be largely invisible to students. However, although students in our writing courses are often not aware of the roadblocks imposed by university infrastructures and institutional politics to developing sustainable new media composition initiatives, they are certainly cognizant of the personal consequences of these impediments: inadequate resources, inconvenient or irregular technological access, and inconsistencies in educational experiences across the same degree program. We cannot help but believe that the difficulties and sometimes outright obstacles that students experience accessing certain technologies to complete work for their courses communicates to them that the university—or, even worse, our department or program—does not consider developing technological expertise to be important for their work as students or for their future plans and goals. Thus, we view the environmental and resource impediments to our technological initiatives as having potentially negative effects on the learning experiences, attitudes, and motivations of students. Furthermore, the lack of sustainability of our initiatives hampers the integration of technologies into our professional writing courses and calls into question the availability of any progress we make with subsequent students and to subsequent classes.

To explore these issues, we employed survey research through which we sought to determine the impact of our resource-poor techno-ecology on student learning experiences and perceptions of themselves as users of technologies and designers of new media texts. We also explored student awareness of the measures faculty take to integrate digital technologies into classroom assignments. In the discussion that follows, we first consider how resource-poor techno-ecologies, like ours, hamper innovation and sustainability of all but the most basic technological initiatives. We then describe in detail the techno-ecology of the professional writing track in the English major at our institution and describe the technological environments in which students must function both in our department and in the institution at large. Finally, we discuss the results and ramifications of our survey and the data we collected. In part, we collected this data about the effects of limited student access to technologies in order to demonstrate the detrimental impact of a techno-poor environment for student learning to administrators, who have the power to help us enrich our environments and to make our important technological innovations truly sustainable.

SUSTAINABILITY AND RESOURCE-POOR TECHNO-ECOLOGIES

Sustainability constitutes a requirement for the integration of technological innovations into a program, department, and/or institution (Weston, 2005). Shelley Billig, Lorraine Sherry, and Bruce Havelok (2005) defined sustainability of technological innovation as involving the “maintenance or scaling up of the innovation by building constituencies and/or champions; creating strong, enduring partnerships; generating and leveraging resources; and identifying and securing funding sources” (p. 988). Cooperation and collaboration among community or institutional constituencies—such as teachers, technological specialists, and administrative and budgetary personnel—proves to be essential in fostering sustainability (Billig et al., 2005; Bridgland & Whitehead, 2005; Cropper, 1996; Lawrenz, Keiser, & Lavoie, 2003), as such cooperation and collaboration provide both a broad base of support for technological initiatives and pedagogical reform. These initiatives and reforms span discrete units (Fishman, Marx, Blumenfeld, Krajcik, & Soloway, 2004), and evidence an institutional commitment to flexibility and positive change (Weston, 2005).

Resource-poor techno-ecologies, however, lack many or all of the elements that facilitate the sustainability and integration of technological innovations; in their place are institutional barriers, turf-wars, and competition for resources, all of which hinder sustainability and discourage lasting technological innovation (Weston, 2005). As Timothy Weston explained, many of the barriers to technological innovation are external to faculty motivation and personal barriers (such as motivation or expertise); the impediments result from institutional limitations, including insufficient financial and technological resources (Warschauer, 2004), and a culture or climate not open to change or receptive to collaboration (Lawrenz et al., 2003). Without an institution-wide commitment to technological innovation, initiatives in some areas (especially those excluded from regular access to resources) are necessarily individual and disconnected from larger institutional concerns. These individual initiatives further hamper sustainability in the institution at large because support personnel, such as library information technology specialists or other IT specialists, have to grapple with unpredictable and idiosyncratic requests of individual faculty, which may distract them from supporting the institutional programs in place (Bridgland & Whitehead, 2004). Given that many of these institutional barriers are systemic, ingrained parts of the structure of the university, faculty who want to alter the environment or subvert these strictures must expend significant energy to navigate the complex “matrix of local and global policies, standards, and practices” (DeVoss, Cushman, & Grabill, 2005, p. 16) that have shaped the institutional context, leaving them with less energy and diminished motivation to develop future innovative digital, multimedia writing projects. Thus, innovation becomes untenable without a sustained effort, for as Richard Selfe (2005) explained,

> we want locally sustainable technologies because we can’t afford to invest time and money in instructional systems that will change over night; because successful teachers explore technology-rich pedagogy over a long period of

> time; and because these efforts should be tied intimately to changes in our understandings of literacy and learning, neither of which are stable. (p. 153)

Although some research has documented the barriers to faculty and student technological innovation posed by a lack of available resources and other institutional barriers (Billig et al., 2005; Bridgland & Whitehead, 2005; DeVoss et al., 2005), less work has been done exploring the effects of poor resources on students' perceived proficiency and students' motivation and desire to use technology in innovative ways. Current research supports the notion that exposure to and instruction in technology in classroom settings provide a foundation for successful use of technologies in post-university environments. From a positive perspective, studies indicate that experience using technologies within supportive educational environments results in a rise in female student self-confidence regarding their technological abilities (Barron, 2004; a finding very important for us as the majority of our students are female). Well-supported experiences provide an important motivation for students, especially females, to develop technological fluency (Barron, Martin, & Roberts, 2007). Classroom instruction in advanced technological skills is essential for all students to function proficiently in other technologically rich environments (Brown & Warschauer, 2006).

CHARACTERISTICS OF ONE TECHNO-ECOLOGY

Investigating Techno-ecologies

An ecological perspective emphasizes the organic interrelatedness of elements in physical and virtual spaces, in which learning occurs, and where resources are found and used. Ecological discussions of learning have expanded from material descriptions of organizations as learning environments (Levitt & March, 1988) to encompass virtual, Web-based environments that facilitate and support learning (Barron, 2004; Brown, 2000; Looi, 1999). Using ecological metaphors to describe institutional contexts highlights the systemic nature of these contexts, in which all units both affect and are affected by connections with other elements in the context. For example, Bonnie Nardi and Vicki O'Day (1999) emphasized the importance of interpersonal relationships in structuring technological use and access in their definition of information ecologies as a "system of people, practices, values, and technologies in a particular local environment" (p. 49). Furthermore, Brigid Barron (2004) demonstrated the importance of expanding the notion of the learning ecology to include all elements of individuals' environments—such as home and workplace relationships and support networks, leisure activities, and classroom experiences—when considering how they attempt to acquire technological proficiency. Barron's conception of learning ecologies centrally locates individuals, which is useful in foregrounding human agency within such systems:

> For the current research, I define a *learning ecology* as the accessed set of contexts, comprised of configurations of activities, material resources and relationships, found in co-located physical or virtual spaces that provide opportunities for learning. This use of the term ecology has the person as the organizing central node in the system, and thus differs from more traditional uses of the term, which usually refer to a single physical environment. (p. 6; see, also, Bateson, 1972; Levitt & March, 1988)

Ecological perspectives, therefore, facilitate rich description of relevant contexts and encourage scholars to investigate the unlikely or unanticipated elements that impinge on learning and, in our case, technology access and use.

Investigating a techno-ecology, similarly, involves the study of the technological elements in a particular context using perspectives analogous to the study of biological or environmental systems. Such an approach not only highlights the interconnectedness common to the other ecological perspectives referenced above, but also questions of resources, economies, and infrastructure that are so closely related to and shape technological ecosystems. The English department at our university—the University of North Carolina Wilmington—which houses our relatively large undergraduate track in professional writing, constitutes one example of a resource-poor techno-ecology. This techno-ecology is characterized by the lack of resources in our local environment and the limited access to university resources afforded to those students who claim our portion of the university ecosystem as home. We currently have 96 majors in the professional writing track (according to February 2007 data). Overall, the university—a public comprehensive university in the southeast—enrolled 11,848 students as of fall 2006. Our students are largely white, middle to upper-middle class, and are mainly from North Carolina, although a significant number of students come from neighboring Virginia, Maryland, New Jersey, and New York.

Our department has one computer classroom equipped with 20 student computers and one instructor computer. We have a projector, DVD/VHS player, and a scanner. The room also has a laser printer, although printing is only permitted from the instructor's computer because the university recently adopted an iPrint pay system for student printing and did not designate our classroom as the site of an iPrint release station (laser printers deployed across campus to which students can print at the cost of 8 cents per page). In terms of software, all computers in the classroom have the standard university Information Technology Systems Division (ITSD)-provided software, which includes a Windows operating system, Microsoft Office 2003, Adobe Acrobat Reader, several multimedia players, and a CD creator program. Additionally, all 21 computers in our classroom have Adobe InDesign, Macromedia Studio MX (Dreamweaver, Flash, Freehand, Fireworks), and TechSmith Camtasia; 11 computers also have Macromedia Director MX. Our department purchased all of this additional software in 2004 with funds from the department's operating budget.[1] Our computer classroom is scheduled with classes from 8:00 am to 9:30 pm, Monday through Thursday. During the spring 2007 semester, students could use the classroom and its resources during 11 staffed, open hours spread over Fridays, Saturdays, and Sundays.[2]

Professional writing faculty and students also have access to one computer classroom in an adjacent building in which we hold our "overflow" courses—those that will not fit into the computer classroom we own. Currently, our courses occupy most of the instructional time slots in this secondary classroom, which has an undesirable layout—the computers are arranged in four long rows with little room in between, making instructor access to students difficult and complicating face-to-face collaborative activities. The computers in this room have the standard ITSD-provided software listed above. Additionally, our department paid half the cost of purchasing 21 licenses for Adobe InDesign for this classroom to support several of our writing courses, such as ENG 310: Theories and Practice of Editing. We cannot secure permission to provide students with access to this secondary classroom outside of class time as the room does not belong to the English department.

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[1] The departmental investment for software in this classroom has been significant; for example, in 2004 our department purchased five licenses for Macromedia Director for $1800, 26 licenses for Macromedia MX for $4082, 31 licenses for Adobe InDesign for $2255, and 21 upgrade licenses for TechSmith Camtasia Studio for $595.

[2] The days and times of open hours in our computer classroom change each semester. Reliably staffing the computer classroom presents another sustainability problem because trustworthy student workers are difficult to find and the full-time lecturer whose job it is to find and oversee student workers in the computer classroom is predictably overworked.

Our present level of technological integration as a track in the major is barely sustainable with the resources outlined above. As the program grows and more courses are added, we struggle to locate computer classrooms in which to schedule courses that, from a pedagogical standpoint, must be taught in such environments. Additionally, although the department can occasionally spare funds to purchase some useful software, upgrading existing programs is never assured.[3] Finally, the replacement of faulty hardware is not guaranteed; for example, in 2004, when our data projector failed, the university's media department refused to replace it until we agreed to cover the cost of the replacement through a combination of department funds and supplemental monies from the dean's office. We recognize that taking on much more in terms of software or equipment in either classroom may make it impossible for us to support the maintenance and upkeep of our existing resources, a reality which certainly dampens enthusiasm for engaging in pedagogical innovation. Furthermore, our ITSD has a predictably negative view of open-source software; persuading them to install such applications on the machines they control is nearly impossible, requiring lengthy conversations and significant expenditures of social capital. Although we are responsible for the purchase of additional software as a department, ITSD retains control of the machines in our classrooms as the price for providing technical support and including our computers in the university's technology lifecycle program. The installation of additional software is restricted by the ITSD-installed application that secures each workstation's imprint, and policy restrictions prevent ITSD from sharing the administrative password for our computer classroom's computers with faculty. As a result, using open-source alternatives is not generally a viable option to replace high-priced, proprietary applications because we cannot install the software ourselves and requests for ITSD to install it are often denied.[4]

Students in our professional writing track also have access to some technologies in the larger university ecosystem, but because their home department is resource-poor, their access across campus is limited.[5] The university maintains only two general-access computer labs; one lab is located in the library and has 47 computers, one scanner, and two iPrint release stations. The second lab is in a classroom building and has 25 computers and one iPrint release station. During spring 2007, the library lab was open 7 days per week, from 8:00 am to midnight on Mondays through Thursdays; 8:00 am to 6:00 pm on Fridays; noon to 8:00 pm on Saturdays; and 1:00 pm to midnight on Sundays. The lab located in the classroom building is open on Mondays through Fridays from 8:00 am to 5:00 pm. Students are also able to check out laptops from three campus locations: 29 laptops are available in the library, ten in the student center, and six in the campus Technology Support Center, and each of these

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[3] For example, we are still using the Macromedia MX Suite and Camtasia Studio 3 from 2004 instead of the new Adobe CS4 and Camtasia Studio 6. Even if we could afford to upgrade this software, the hardware in our computer classroom could not efficiently run the upgraded applications, as it is at the end of its lifecycle. Computers in computer classrooms are lifecycled roughly every 5 years, as the budget permits.

[4] Many faculty inform students about where to find open-source software alternatives for their personal computers and try to support students in using these applications.

[5] Student access to software at reduced prices is also hampered by their attendance at UNCW as opposed to other universities in the North Carolina system. Students at UNCW can purchase Microsoft Office 2007 from ITDS recommended off-campus venders for between $80 and $120 and Adobe CS3 Web for $400). In contrast, students at North Carolina State University can purchase Microsoft Office for $60 and Adobe CS3 Web for $220. Our ITSD staff explained that the disparity in student software pricing can be attributed to the amount paid by the university to off-set student prices and to follow the licensing agreements agreed upon between institutions and corporate vendors.

locations also has one iPrint release station. Thus, our campus of almost 12,000 students provides only 117 computers for general student use. Additionally, all of the general access computers offer only the basic ITSD-provided software mentioned above, which is generally inadequate for more complex multimedia authoring tasks.

There are, however, many more computer classrooms and other sorts of technologically enhanced learning spaces on campus, housed in other departments in newer, well-equipped buildings. For example, the film studies program provides their students with exclusive access to two classrooms with video equipment, video-editing stations, and the latest film-related software. Additionally, the School of Education Building has a large, well-staffed computer lab with open hours 6 days per week in addition to several other computer classrooms open only to education students. Students in the School of Business have access to two additional open computer labs, one with open hours all day, 7 days per week. These labs are not available to students in other schools and departments; access is restricted through card swipe systems. Thus, although English students pay the same technology fee as students from other departments, their level of technological access both in and outside of class is relatively poor, and they are barred from other access points as a result of belonging to the resource-poor techno-ecology of the English department.

Attempts by Faculty to Understand and Enrich Our Techno-ecology

Access to advanced writing and communication technologies is most important for students in the professional writing track of our English major. This track was initiated in 2001 and at the time this research was completed there were no tenured faculty members whose teaching and research areas were in professional writing or computers and writing teaching the upper-division writing courses that incorporate multimedia authoring. As a result, faculty most in need of the resources to promote innovative writing pedagogies were those with the least power from an institutional perspective; the least amount of experience negotiating the university’s complex systems of funding and resource management; and the least amount of extra time to spend advocating for needed resources and seeking alternate ways of obtaining them.

Despite our positions as untenured professional writing faculty, all of us made efforts to understand the flow of resources within and enrich our techno-ecology early on in our arrivals at the university, with varying levels of success. We successfully sought support from our department chair for the department to purchase some of the applications needed to teach multimedia composition. However, our overtures to other higher-level administrators were less successful, despite our attempts to demonstrate how our use of multimedia writing technologies contributed to our department’s participation in the College of Arts and Sciences (CAS) sponsored learning initiatives, including the use of student-authored Web-based portfolios for outcomes assessment and the integration of service learning projects in which students created Web sites and other texts for local non-profit organizations.

Professional writing faculty have also attempted to apply for grants through established programs funded by the university and outside agencies to obtain money for some of the technological resources we needed. For example, in spring 2003, Reilly applied for an ITSD Innovation Grant for staff support and hardware to configure and house an open source, electronic portfolio application, and Atkins applied for the same grant in spring 2006 for equipment to produce digital videos for use in classroom exercises; neither application resulted in funding. Reilly and Atkins were successful in their application to an outside organization, Friends of UNCW, to obtain funding for a digital video camera for the department in May of 2007 (we received notice of our award after our survey data was already collected). Notably, the Friends indicated that our inclusion of a DVD of student video projects created using cameras borrowed from Randall Library proved to be the most persuasive portion of our application. Finally, in spring 2008, Atkins and Reilly both applied for and received internal grants to develop distance learning versions of writing courses using Blackboard Vista. Although this grant will not directly assist us in obtaining resources for our classrooms, our work with distance learning—an important university and state-wide mandated growth area—will potentially aid us in developing strong reputations with university administrators and ITSD staff as exemplary adopters of technologies for teaching. Cultivating such relationships may conceivably result in access to resources in the future.

In fall 2007, we achieved some success by meeting with our campus administrator involved in the management of infrastructure.[6] In a meeting with all three professional writing faculty, Diana Ashe, Atkins, and Reilly, this administrator agreed to help us gain access to a second overflow classroom in a neighboring building and agreed to help push for a second computer classroom in our building that would come online in fall 2008. However, the second overflow classroom is not optimal for our upper-division professional writing courses, as the computers in that room have only the standard ITSD provided software and the workstations lack speakers and microphones. Not surprisingly, the construction of a second computer classroom in our building has been indefinitely delayed due to budget and resource constraints.[7]

A recent meeting with this same administrator to demystify the funding processes for adding and upgrading technologies in traditional and computer classrooms confirmed for us that there is no written policy outlining technological funding priorities or procedures and no set mechanism for formally requesting upgrades, making it difficult for the processes to be predictable and transparent to faculty. ITSD maintains a Classroom Technology Assistance Program (CTAP), in which educational spaces are divided into tiers. Environments at Tier 1 get full support and participate in the campus technology lifecycle program, meaning that their equipment is upgraded at regular 4 to 5 year intervals. Spaces designated Tier 2 are equipped with some digital technologies, usually provided and paid for by the campus unit, but because the technologies do not meet ITSD standards, ITSD declines to support them. Spaces labeled Tier 3 have no digital technologies at all. When the administrator with whom we spoke took over about 3 years ago, very few campus spaces were ever upgraded from Tier 3 to Tier 2, or Tier 2 to Tier 1, thus forcing campus units struggling to purchase and maintain their meager amount of technology to continue to do so without any support. Additionally, no clear listing of priorities or criteria existed then or now to determine which spaces were next in line to be upgraded. These decisions were— and, to a great extent—continue to be made on the basis of the perception by ITSD administrators that campus units already technologically advanced most needed further infusions of equipment and support. ITSD has not been troubled by the

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[6] We decline to identify this administrator further as we do not wish to implicate any individual in what are long-term, systemic problems. This individual has provided all the assistance and information possible given the limits of their budget and position.

[7] During our recent meeting with the administrator in charge of infrastructure, we were reminded of the ways in which the inequitable distribution of limited campus resources most negatively impacts the most resource-poor areas of the techno-ecology. In spring 2008,a unit on campus received a new fully equipped video-editing laboratory containing workstations that cost considerably more than the baseline funding point of $1000 per workstation, because they have greater memory and superior video cards. These computers are part of the campus technology lifecycle program, so in 5 years, the administrator in charge of infrastructure, whose budget remains the same from year to year, will have to replace these computers at a higher cost, leaving less money to upgrade spaces with inadequate technologies in other portions of the college.

disparity of resources across campus and has been content to leave particular campus units resource-poor.[8]

Although we have experienced difficulties obtaining university funding, our situation in the Department of English is not significantly different from that of other humanities departments in the college. Humanities faculty and departments at our university are historically on the low-resource end in our techno-ecology and are not routinely included in administrative conversations about technological needs and resource distribution. In part, the humanities may be overlooked due to misunderstandings on the part of administrators about how technologies are used in humanities disciplines, resulting from a lack of communication. The 2007–2008 UNCW *Information Technology Systems Division Annual Report* (2008) described the reorganization of ITSD and the creation of three new advisory committees: the Committee for IT Strategic Planning, the Committee for Academic Research Technologies, and the IT Student Advisory Council. In the inaugural year of each of these committees—comprised of administrators, faculty, and students—no humanities faculty were included as members. Of the ten student members on the IT Student Advisory Council, only one is from the humanities, while three are from Business Administration and three from Computer Science. Significantly, only three of the ten students on the IT Student Advisory Council are women, despite a campus population that is 58% female.

Now that the recently published ITSD annual report has informed us of the existence of these new committees, we can endeavor to join them or make our needs known to their membership. In terms of committee membership, we have achieved some measure of success elsewhere, as Reilly was appointed to the Faculty Senate IT Committee in fall 2007 after a number of years requesting this assignment. The lack of representation of humanities faculty on these IT-related committees is emblematic of the invisibility of the humanities in relation to decisions about the distribution of technological resources on our campus. Although we can perhaps be faulted for not doing more to make our needs clear to our administration, we face obstacles in doing so. As noted at the start of this chapter, the extraordinary—and typically invisible, at the administrative level—means we must undertake to make our voices heard and have our resource needs met are currently unsustainable personally, programmatically, and departmentally. We operate in starts and stops, depending on our teaching commitments, administrative responsibilities, scholarly demands, and the need to perform other work that actually counts toward annual review, tenure, and promotion. As we are a minority program within a literature-dominated (in terms of numbers of faculty) English department, our efforts to increase the technological access of our students is largely invisible.

A SURVEY STUDY: EFFECTS OF THE TECHNO-ECOLOGY ON STUDENT EXPERIENCES

To determine how our resource-poor techno-ecology affects student educational experiences and perceptions, we constructed a survey. The following sections describe the design and administration of our survey and our results.

[8] The administrator we spoke to has improved the situation, making the elevation of spaces from one tier to another a priority. This individual is not content with the technological marginalization of entire areas and campus units; however, as our conversation revealed, it is still the case that signature programs are receiving huge influxes of resources outside of the equitable distribution of funds to all units, making the maintenance of the resource-poor areas, like ours, even more challenging. The lack of transparency in terms of the distribution, prioritization, and application for resources makes requesting them a frustrating process.

Survey Design

We collected data via a survey that included a battery of questions to discover student impressions, attitudes, opinions, and feelings about the access and quality of technological resources in the English Department and in other work spaces at the University of North Carolina Wilmington. The survey was also designed to reveal student processes for finding the technologies needed to complete required course work in our department and to determine how the lack of resources that we struggle with everyday affects student views of themselves as current and future users of technology. The survey engine we used to collect responses was SurveyMonkey, an online survey tool.

We divided our survey into four major sections: demographics, student experiences, professor experiences, and an adaptation of the questions from the Unified Theory of Acceptance and Use of Technology survey (UTAUT; Venkatesh, Morris, Davis, & Davis, 2003; see Appendix for a complete list of the survey questions). The **demographic** section asked students about their majors, year in school, current courses, and gender. Because we surmised that student perceptions of technological access and proficiency would evolve as they moved through the program, we attempted to get a complete picture of respondents in terms of their educational experiences and progress through our program or their respective majors. Isolating gender was important for us, because our major is female-dominated and previous research indicates that supportive instruction in the use of technologies in class has a particularly strong impact on female student technology use self-perceptions (Barron, 2004).

In the **student experiences** section, we asked respondents eight questions about their access to particular computer technologies, both hardware and software; how they gained access on campus to technologies needed for their courses; and what sorts of professional writing careers they were both interested in and felt qualified to pursue based on their experiences. By asking these questions, we hoped to correlate access issues and lack of experience with student career goals and the degree to which they felt prepared to pursue them. The **professor experiences** section served a similar purpose. The questions about the student perceptions of professor access to various technologies in their classrooms were designed to identify what students noticed about instructor efforts in obtaining necessary technologies for and in their courses.

The final 23 questions were adapted from a standard survey, the **Unified Theory of Acceptance and Use of Technology** (UTAUT). This survey was developed by information technology researchers to investigate user responses to and willingness to adopt new technologies (Venkatesh et al., 2003), and has been statistically analyzed and applied by numerous other scholars in information technology and other fields (see Anderson & Schwager, 2004; Pappas & Volk, 2007; Ristola, Koivumaki, & Kesti, 2005). The questions in this survey use a Likert scale (1–7, 1 being “strongly disagree” and 7 being “strongly agree”) and ask respondents to report their attitudes toward adopting and using new technologies, and to assess the support and resources available to facilitate their use of these new technologies. We added this survey to our locally developed questions to give our instrument greater support and validity, as the use of this survey has been documented in numerous peer-reviewed publications in journals and conference proceedings. Additionally, as we discuss below, by cross-referencing the responses to the UTAUT questions with those we developed, our results have greater depth.

Survey Distribution

To administer this online survey, we distributed the survey link to instructors teaching core professional writing courses taught in computer classrooms. We attempted to reach students in the initial, middle, and final stages of completing coursework in professional writing. The survey was administered in 14 different courses, each of which was capped at 20 (though not all sections were full). Instructors asked students to complete the survey during the first 15 minutes of a class meeting during a 1-week period. Students were instructed to complete the survey only once, as many students were enrolled in more than one of the courses in which the survey was distributed; 98 students completed the survey. Our efforts to collect the maximum number of responses were hampered somewhat because we could not force students to participate in the survey nor could we force teachers to administer it, although most teachers appeared vigilant in their efforts to distribute the survey based on the numbers of responses we received. Additionally, we received reports that some students could not take the survey because the link did not work or, when they clicked on the link, it took them to a completed survey because the workstation they were using had not been restarted. We also learned that some teachers simply forgot to distribute the survey. While we cannot be absolutely certain that each and every response came from a different student, we felt it unlikely that students would voluntarily take such a lengthy survey more than once. We evaluated our responses for indications that the respondent came from our desired population sample; our number of responses (N=98) roughly correlated with the current number of majors in professional writing.

SURVEY RESULTS

In discussing our results, we focus on three distinct areas related to sustainability. The first area we discuss is access. We believe that creating a sustainable techno-ecology depends not just on basic access, but rather on the types of access that students and teachers have to technological resources. Cynthia Selfe, Gail Hawisher, Dean Woodbeck, and Dennis Walikainen (2004) referred to “conditions of access” to expand access beyond the limited notion of physically obtaining something. Conditions of access include “timing, motivation, fit, safety, resources, and appropriateness of equipment” (Selfe et al., 2004, p. 84). We address conditions of access through survey questions related to the types of applications and tools students and professors use, and the contexts in which they locate and use them. We discuss what our results tell us about curriculum effectiveness—or how well, according to student experiences—our program prepares them for work both within and beyond the department and the university. Curriculum effectiveness is also reflected in student attitudes toward the hardware and software they use in the process of moving through our professional writing program and in the importance they place on gaining proficiency with these technologies. Lastly, we discuss how our results provide insight into students’ experiences and self-perceptions as users of the software and hardware presented to them in their courses. For us to develop a sustainable curriculum in which students acquire an increased proficiency in the use of sophisticated software and hardware crucial for writing and communication in contemporary organizational contexts, we must cultivate student desire for increasing levels of access and motivations to improve their skills. Without that, we are starting over in each course we teach, and we lack student support in our continued efforts to provide increased access and improved instruction.

Through our discussion and analysis of our results, we create a snapshot of our program, which we think will resonate with others teaching in or administering similar programs. Additionally, we illustrate how using such a survey might be productive for other programs in assessing the successful integration of technologies. Finally, we propose that collecting this sort of data can be persuasive to administrators and used to support initiatives that increase access and the likelihood of the sustainability of innovative technology-rich pedagogies.

Conditions of Access

When creating a sustainable techno-ecology, programs and departments must consider issues related to access. Students need access not just to the technologies themselves, but also to resources necessary to help them complete tasks and projects. Furthermore, access should be obtained with a minimum of effort and inconvenience, as barriers to access may discourage students in multiple ways. Considering the conditions of access causes us to examine, as we attempted to do through our survey questions, how and where access is obtained and to measure the degree to which obtaining access places an additional burden on students and their professors. For example, students may have access to a piece of software inside the classroom, but lack sufficient access when completing a project or task on their own outside of class.

Over half (52%) the respondents reported finding access when needed, though many of them explained (and complained) that they were sometimes unable to get access to the software and/or hardware they needed when they needed it or without considerable extra effort. Furthermore, in light of student responses regarding what sorts of software they need to use to complete course projects, it is not surprising that the majority of students were able to obtain the necessary applications. As demonstrated in Table 1, only a small percentage of students are being asked to use more complex applications that encourage multimedia composition (such as Adobe Photoshop, Macromedia Dreamweaver, Macromedia Fireworks, and Camtasia Studio) to complete course projects, a disappointing but not unexpected finding.

Table 1. Software respondents reported using regularly to complete course assignments (N=98; response to question 6).

SOFTWARE	RESPONSE % (n)
Microsoft Office (Word, PowerPoint, Excel, Access)	100.0 (98)
Microsoft FrontPage	38.8 (38)
Microsoft Publisher	43.9 (43)
Adobe Photoshop	16.3 (16)
Adobe InDesign	29.6 (29)
Adobe Acrobat Professional	33.7 (33)
Macromedia Dreamweaver	11.2 (11)
Macromedia Fireworks	6.1 (6)
Macromedia Director or Flash	9.2 (9)
TechSmith Camtasia	11.2 (11)
Open-source software (e.g., OpenOffice)	4.1 (4)
Other	12.2 (12)

Nearly half (49%) the respondents have personal access to the necessary tools to complete course assignments. The remaining 51% of students reported using multiple means to locate and use the tools they need. Open-ended question 9 prompted students who indicated in question 8 that they “sometimes” or “never” were able to get access to the technologies needed to complete course assignments to explain any extraordinary means they used to accommodate their needs; 43 students (44% of total respondents) provided discursive answers to this question. As one student noted:

> Computer labs are regularly filled during midterm exams and especially during the last three weeks of a semester. Also, there is significant walking distance when trying to find an open computer lab. The computer lab in S&B [Social and Biological Sciences] is only open sometimes--the hours seem to be dependent upon when the lab monitor needs to leave, whether it's at 5pm or at 2 in the afternoon. Students never know whether the computer lab in S&B is going to be open unless they physically walk to S&B and see if the computer lab door is open or closed. There do not seem to be enough open computer labs on campus. The computer lab in Morton Hall is small and rarely open; the computer lab in Bear Hall is small and rarely open. And these are problems. Also, software needs can be a problem. If the university is going to assign projects where certain computer programs or certain hardware needs to be used, then the university should supply those things.

This response is indicative of the narrative responses we received. Other students said:

> Not all of the computer labs have all of the same programs, and many times it takes more than one program to complete a project. This can be frustrating. Also, when a lab only has software on every other computer, this makes completing a project difficult as well.

> I was required to create webpages, but Dreamweaver is not on the regular computers in the Library or Underclassmen lab, and I do not have it at home. I was also required to use Adobe Indesign [sic] to create documents, and it is also not available to me in Library or Underclassmen lab and I also do not have it on my home computer. I was also required to use screen recording software Camtasia which also not available to me in Library or Underclassmen lab and I also do not have it on my home computer. Also the lab times that the computers that do have this software are avaliable [sic], I have to be at work, or am taking other classes.

When we cross-tabulated responses, we noted that the same 51 (52%) respondents who indicated that they had access “All the time” also reported using less convenient means to gain that access at least some of the time: 9 reported using their professor’s computer, 20 reported going to a friend’s house to use software/hardware, and 23 reported using a publically accessible computer.

Our data pertaining to professor experiences reflects that students perceive that faculty sometimes need to take extraordinary measures to obtain needed technologies. Fifty-two of the 95 students described witnessing teachers struggling to find resources for classroom activities and course assignments. As one respondent noted:

> We had only three microphones in a class of 20 students, whereby a microphone was needed per every four students. So we were two microphones short every class, and this directly impacted learning because eight students had to wait around for the other 12 students to finish with their three microphones so that we could use them. Luckily, our instructor had an extra microphone at the computer in his office, so one group of four was permitted to leave the classroom and use our instructor’s computer. Then we were only one microphone short.

The scenario above is quite typical of situations we encounter during a typical semester. Other students noted similar difficulties:

> In eng 204 my professor wanted to do some other projects that would further enhance our learning in the course. He could not, however, deliver the soft/hardware for us to complete the project.
>
> We needed to reserve time and travel out of class to work on video editing projects for Eng 496
>
> WE NEED MORE COMPUTERS!!! I hope the future generations of students at UNCW have better/more access to more computers and more software. Having only 11 copies of Macromedia Director in the Morton english [sic] lab is NOT appropriate. Half of the speakers and other materials do not even work.
>
> In a journalism class I took only half of the computers in the classroom had InDesign and the professor could not get it installed on the other computers.

These excerpts from student observations reflect awareness of the lack of access and the problems posed by inadequate equipment. Like students, faculty are faced with searching for access to tools and resources (e.g., microphones, video cameras, video-editing software, and players for multimedia compositions) to complete instructional tasks and course assignments. In fact, 50 students (52.6%) reported observing their instructors borrowing space, time, or equipment from colleagues or other departments to obtain software/hardware needed for course projects. This kind of disjointed, hodgepodge access to digital technologies pollutes the very techno-ecology we seek to create by putting students and teachers in the detrimental and unsustainable position of struggling to develop and complete activities and assignments that have excellent potential, but are compromised pedagogically because both the student and teacher become preoccupied with accessing the needed tools.

This kind of digital resource scavenging attunes students to the university's priorities in relation to the distribution of resources. For example, in question 14, students were informed that they pay $195.38 each semester as a standard technology fee included in their tuition; 59% indicated that the fee did not seem "fair" based on the efforts they had to put forth to access the technologies they needed to complete course projects. This becomes more important when one considers the conditions of access in other departments. All students pay the same technology fee, yet not all students have the same access to technology. Interestingly, however, when students were asked UTUAT question 25 about the support they were getting from the university as it pertains to the use of communication software and hardware, the majority of them (81%) responded positively. The mostly positive response may stem from students' abilities to find the software or hardware when needed or from the fact that the majority of their courses do not require the use of more difficult-to-obtain applications such as Web-authoring applications or video-editing software. Perhaps for many, the ITSD basic software imprint seems sufficient. Additionally, as illustrated by the student comment above, perhaps students are more likely to blame instructors for creating assignments that require the use of difficult-to-access technologies, rather than blame the university for not providing better access in the first place.

Curricular Effectiveness and Student Self-perceptions and Confidence as Users of Technologies

In addition to gauging student perceptions of their access to technologies, the survey was also designed to determine student perceptions of the effectiveness of our curriculum, particularly in relation to how well it prepared them to be successful and confident users of writing and communication technologies. The effectiveness of our techno-ecology is not only based on access, but also on developing a curriculum for students in professional writing that reflects current organizational and workplace trends and that challenges students to write in a variety of contexts, using multiple media and writing spaces, both physical and digital. Hiring individuals with cutting-edge pedagogical rigor and scaffolding the sequences of courses in an environment that nurtures the professional and creative ideas of students are two imperatives when designing a cohesive and consistent techno-ecology that adequately prepares students for the challenges they face outside of the university setting.

We expect faculty to incorporate innovative uses of technologies into their classes, because helping students use a wide range of tools is one of our programmatic goals. Our focus is not to make or mold students into expert users of particular hardware or software applications, but to cultivate in them the skills necessary to learn how to use unfamiliar tools. Focusing on the learning process rather than on the technical mastery of particular tools helps students learn the transferable skills of problem-solving, critical thinking, and contextual analysis that will serve them well in a multitude of contexts (DeVoss & Selfe, 2002; Gee, 2003). However, as reflected in their responses, a majority of the student respondents lack regular experience using applications beyond the ubiquitous Microsoft Office software. About a third of the surveyed students regularly use Adobe InDesign and Acrobat Professional, but a much smaller percentage use the more complex graphic-design, Web-authoring, and video/animation applications, including Adobe Photoshop, Macromedia Dreamweaver, Macromedia Fireworks, Macromedia Director, and TechSmith Camtasia (see Table 1).

Exposure to a wide range of applications also teaches students to make choices about the appropriate tools to accomplish certain goals. As Anne Wysocki (2004) argued:

> digitality ought to encourage us to consider not only the potentialities of material choices for digital texts but for *any* text we make, and that we ought to use the range of choices digital technologies seem to give us to consider the range of choices that the printing-press technologies haven't. (p. 10)

Without exposure to multiple applications that perform similar functions, students are not provided opportunities to choose between them and understand the ramifications of those choices. For example, if students only use Microsoft FrontPage as their Web-authoring tool, they may not gain an understanding of the situations in which Macromedia Dreamweaver might be a more appropriate or powerful application, nor would they acquire the comparative knowledge needed to be critical of FrontPage's limitations.

Beyond teaching necessary problem-solving and analytical skills, classroom experiences shape student perceptions of professional writing as an occupation, as prior to taking courses many students have little understanding of this broad and diverse field, which encompasses occupations from technical writer to documentation specialist to multimedia content developer. Therefore, we predicted that the types of assignments and projects students complete and the types of software they are required to use have a direct impact on how they conceptualize the field. Using the Society for Technical Communication (STC; http://www.stc.org) Web site to generate our list, in question 11, we asked students to select the job titles related to professional writing that they found appealing.

In question 12, we presented students with the same list of job titles, but asked them to check the positions for which they felt qualified to apply. As Table 2 illustrates, in general, the number of students who felt qualified for each sort of position decreased from the number of students who expressed interest in those positions. More significantly, fewer students felt qualified to apply for positions requiring a greater degree of technological expertise. For example, while 35 students surveyed expressed interest in the position of Graphic

Artist/Designer, only 12 felt qualified to apply for such a position. Similarly, 26 students expressed interest in the position of Web Designer, but only 13 reported confidence in their qualifications as potential Web designers.

Table 2. Positions respondents indicated interest in and reported feeling qualified for (comparative responses to questions 11 and 12; N=98).

POSITION	INTERESTED IN % (#)	FELT QUALIFIED FOR % (#)
Advertising	60.2 (59)	39.8 (39)
Book / Magazine Editor	57.1 (56)	35.7 (35)
Graphic Artist / Designer	35.7 (35)	12.2 (12)
Marketing Assistant in Publishing	36.7 (36)	17.3 (17)
Print Journalist	40.8 (40)	37.8 (7)
Interactive Journalist	35.7 (35)	24.5 (24)
Technical Writer / Documentation Specialist	35.7 (35)	38.8 (38)
Online Marketing Specialist	29.6 (29)	7.1 (7)
Online Training Developer	13.3 (13)	4.1 (4)
Proposal / Grant Writer	5.1 (5)	18.4 (18)
Usability Research Consultant	8.2 (8)	8.2 (8)
Web Content Manager	16.3 (16)	13.3 (13)
Web Designer	26.5 (26)	13.3 (13)
Other	13.3 (13)	12.2 (12)

When responses to question 12 are cross-tabulated with the demographic question 3 that asked students their year in school, we gain even more insightful results. For example, Print Journalist is one of the choices students could select as an appealing occupation, and relatively equal numbers of sophomores, juniors, and seniors expressed interest in this sort of position. However, as noted above, for positions that require intensive technological proficiency and use (e.g., Interactive Journalist, Web Designer), not only do fewer students feel qualified to apply for positions than are interested in those positions, senior students reported feeling less qualified than their junior counterparts. When we cross-tabulated question 3 with questions 11 and 12, we saw that 14 juniors and 9 seniors were interested in the position of Interactive Journalist while 10 juniors and 5 seniors felt qualified to apply for this type of position. A similar result is observed related to the position of Web Designer, with 13 juniors and 9 seniors expressing interest and 8 juniors and 3 seniors feeling qualified. This data is particularly troubling, as it may indicate that as students progress through our program, they become less confident in their qualifications for positions involving a significant use of communication and information technologies. Although we cannot know precisely why students responded as they did, such results give us pause and indicate the need for further investigation and possible curricular revision.

Intriguingly, when students were asked in question 27 whether they believed they had the knowledge necessary to use communication hardware and software, their responses were mostly positive, with 80% of respondents selecting 5, 6, or 7 on the Likert scale. This seems to contradict the results regarding the questions listing particular positions and asking respondents how well they felt qualified for them. We attribute this disparity to the way respondents approach different sorts of questions. That is, a question (such as question 12) presenting a particular scenario may yield a more concrete response in contrast to the request for respondents to rate general skills (such as question 27), possibly, in part, due to the possibly more open-ended interpretation of writing and communication software/hardware by individual students when reading the general question.

Although many students expressed confidence in possessing the necessary knowledge, when asked about levels of apprehension and fear of making mistakes, responses were mixed. For example, in response to question 34, almost 20% of students reported some level of apprehension in using communication software and hardware by selecting 5,6, or 7 on the Likert scale, while another 24% were undecided, selecting 4. When the responses to question 34 are cross-tabulated with question 5 identifying students' gender, we find that a higher percentage of female students report apprehension than do their male counterparts: on a scale of 1–7, with 1 indicating "strongly disagree," and 7 indicating "strongly agree," 15 (25%) females selected undecided and 13 (21%) agreed with this statement, in contrast to their male counterparts, 7 (23%) of whom were undecided and 5 (17%) of whom were in agreement. Furthermore, a higher percentage of males (30%) strongly disagreed with this statement, compared to only (16%) of females.

Students were asked to report whether or not they were scared to lose data when using writing and communication software/hardware by hitting the wrong key. When responses to this question were cross-tabulated with question 5, we found that 48% (29) females versus 43% (13) of males expressed some level of agreement with this statement. Additionally, another 22% (14) of females were undecided or neutral, selecting 4, with only 30% (18) of them expressing disagreement, as opposed to 47% (14) of males.

Reports of apprehension and the fear of making a mistake, of hitting the wrong key and losing data, are significant in that they might stifle innovation by causing students to be reticent to experiment with new tools, especially through play or by trial and error. That female students appear less confident and more fearful is very significant for future instructional efforts, as they make up the majority of the students in our program.

Our results reflect that we are currently unsuccessful in creating a techno-ecology that: fosters confidence, especially among female students; provides significant instruction in a range of hardware and applications; and demonstrates to students their preparedness for high-tech occupations related to professional writing. Addressing these issues will require increasing access by making more effective arguments to department and administrative decision-makers and by demonstrating to our faculty the need for depth and breadth when incorporating technologies into our courses.

CONCLUSIONS

In *Opening Spaces: Writing Technologies and Critical Research Practices*, Patricia Sullivan and James Porter (1997) urged those of us in rhetoric and composition, computers and writing, and professional writing to "appreciate each other" (p. 185)—to consider more carefully the research across disciplines so that we can address knowledge gaps in each of these related but at times discrete fields. Our survey research addresses issues relevant to all fields of writing instruction at a moment of technological acceleration and in a time in which the disparities between programs and institutions rich and poor in technological access and support have never been greater.

Sustainable techno-ecologies are important for contemporary teachers of writing in part because of the new ways teachers and students are beginning to compose new media texts (see, for example, Selfe, 2007; Westbrook, 2006; Wysocki, Johnson-Eilola, Selfe, & Sirc, 2004). To allow students to play with textual and graphic materials and to develop confidence in their composing abilities in a compelling medium requires a supportive and sustainable techno-ecology in which they can work. Teachers need space, equipment, and support to create a classroom environment in which students interact, design, compose, and collaborate using the most appropriate equipment for the assignment they are completing.

Based on our survey results, and despite the self-reported tenacity of many of our students, we discovered that students do not always have an appropriate place to work or access to equipment needed to complete assigned projects central to our program. Likewise, teachers, as resourceful as they are, do not always have access to equipment needed to initiate innovative, technology-rich pedagogies. We can also infer from our data that the lack of access and range of complicated experiences that using digital technologies appears to have detrimental effects on some students' perceptions of their fitness for specific high-tech careers in our field and on their comfort levels and confidence as technology users. In some cases, this is particularly true of female students, which is alarming in light of continuing income disparities among male and female workers and the unequal representation of women in occupations related to science and technology.

The troubling results we see in this data provide the impetus for curricular change and for additional research to monitor and assess techno-ecological conditions on our campus. Our goals for the future will be to find appropriate technological equipment, space, time, and support that will be sustainable each semester, each year, and across time, so that teachers and students know what to expect when entering our classrooms. Importantly, we want to eliminate as much as possible the idea that faculty must expend extraordinary energies to obtain and use digital technologies. To that end, we intend to continue to seek positions on committees related to technological resources on campus; participate in technological initiatives central to the university's goals and mission so as to build capital with relevant administrators and others controlling resources; apply for relevant internal and external grants to garner our own resources; and, using the recently achieved tenure status of two of our faculty, more forcefully argue for our share of resources. Finally, by achieving tenure, we are in a better position to seek the external funding necessary to enrich our techno-ecology, although we still view this challenge as somewhat daunting.

Placing teachers and students in instructional environments where digital technologies are available increases the chances that they will be successful when interacting with those tools within and beyond their programs of study. As a result, we must facilitate partnerships and relationships with our university community to foster sustainability; there is much to do that we cannot do alone as a department or a small program. We plan to use the results of our survey to support petitions to upper administration for additional computer classroom space and technological resources. Through this study, we highlight the need to integrate student experiences and perceptions into our research and our planning when attempting to create sustainable techno-ecologies. We invite others to adapt and administer our survey, to change it, critique it, and alter it to suit their specific institutional needs, and we are happy to consult with other researchers also navigating the institutional intricacies that invariably impact the ways we work, teach, and do research. We plan to build on our study and continue to develop and grow our techno-ecologies with student experiences and learning outcomes fueling the direction our efforts will take.

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Appendix. Survey questions.

Download survey as Word document: 03_Atkins_Reilly_Word.doc
Download survey as rich-text format document: 03_Atkins_Reilly_RTF.rtf

Demographics

This survey is designed for you to express your feelings, attitudes, and opinions about your experiences with technology on campus at UNCW. When you answer the questions below, please consider only your on-campus experiences with and access to hardware/software unless the question specifies otherwise. For example, some questions may ask you to indicate that you have access to required software/hardware at your home. An asterisk beside the question number means that a response is required before being allowed to move to the next question.

1. What is your major?

- ☐ English (professional writing)
- ☐ English (literature)
- ☐ English (Teacher Licensure)
- ☐ Creative Writing
- ☐ Communication Studies
- ☐ Business (any major in Cameron)
- ☐ Other (please specify)

2. What is your minor?

- ☐ English (professional writing-certificate)
- ☐ English (literature)
- ☐ Journalism
- ☐ Communication Studies
- ☐ Business
- ☐ Other (please specify)

3. What is your academic Status?

- ☐ First-Year
- ☐ Sophomore
- ☐ Junior
- ☐ Senior

4. What English Course are you currently taking? (if more than one--check all that apply)

- ☐ English 204
- ☐ English 310
- ☐ English 312
- ☐ English 313
- ☐ English 314
- ☐ English 496

5. What is your gender?

- ☐ Male
- ☐ Female

Student

6. What sorts of software do you regularly use on campus to complete course assignments? Check all that apply. (Use the textbox below to list types of software not on the list)

- ☐ Microsoft Office (Word, Powerpoint, Excel, Access)
- ☐ Microsoft Front Page
- ☐ Microsoft Publisher
- ☐ Adobe Photoshop CS
- ☐ Adobe InDesign
- ☐ Adobe Acrobat Professional (pdf reader/converter)
- ☐ Macromedia (Dreamweaver)
- ☐ Macromedia (Fireworks)
- ☐ Macromedia (Director/Flash)
- ☐ Camtasia
- ☐ Open Source Software (OpenOffice, for example)
- ☐ Other (please specify)

7. What sorts of hardware do you regularly use on campus to complete course assignments? Check all that apply. (Use the textbox below to list types of hardware not on the list)

- ☐ Digital Video Camera
- ☐ Desktop Computer System
- ☐ Laptop
- ☐ DVD Burner
- ☐ CD Burner
- ☐ Digital Audio Recorder
- ☐ Digital Scanner
- ☐ Digital Still Camera
- ☐ Other (please specify)

8. How often are you able to gain access to digital technologies (software and hardware) on campus required to complete course assignments?

- ☐ All the time
- ☐ Sometimes
- ☐ Never

9. If you answered: Sometimes, Never, describe a situation in which you were unable to accommodate your technological needs for a course assignment.

10. What other locations, on or off campus, have you visited to gain access to software/hardware to complete course assignments? Check all that apply.

- ☐ Used your professor's computer
- ☐ Went to a friend's house to use software/hardware
- ☐ Used a publicly accessible computer (such as one at a public library)
- ☐ I have personal access to all necessary software/hardware for my course assignments
- ☐ Other (please specify)

11. People with degrees in professional writing hold a wide variety of positions. Which of the following positions appeal to you? Check all that apply.
   - Advertising
   - Book/Magazine Editor
   - Graphic Artist/Designer
   - Marketing Assistant in Publishing
   - Print Journalist
   - Interactive Journalist
   - Technical Writer/Documentation Specialist
   - Online Marketing Specialist
   - Online Training Developer
   - Proposal/Grant Writer
   - Usability Research Consultant
   - Web Content Manager
   - Web Designer
   - Other (please specify)

12. Of the positions listed below which one/s do you feel qualified to apply for? Check all that apply.
   - Advertising
   - Book/Magazine Editor
   - Graphic Artist/Designer
   - Marketing Assistant in Publishing
   - Print Journalist
   - Interactive Journalist
   - Technical Writer/Documentation Specialist
   - Online Marketing Specialist
   - Online Training Developer
   - Proposal/Grant Writer
   - Usability Research Consultant
   - Web Content Manager
   - Web Designer
   - Other (please specify)

Professors

13. Undergraduate tuition and fees at UNCW includes a technology fee. What do you think the amount of that fee is for a student enrolled in 12 credit hours or more?
   - $49.95
   - $97.69
   - $146.54
   - $195.38

14. Most universities require a technology fee. Is UNCW's technology fee of $195.38 (for students enrolled in 12+ credit hours) fair, based on your level of on campus access to software/hardware?
   - Yes
   - No
   - Don't Know

15. Does the computer classroom in which your classes are held contain the necessary software/hardware needed to complete course assignments?
- Always
- Sometimes
- Never

16. Please offer an example of an instance whereby your professor/s may or may not have been able to acquire necessary software/hardware for use in the classroom to complete course projects.

17. Which of the following methods have you observed professors use to obtain software/hardware needed for course projects. Check all that apply.
- Borrowed space, time, equipment from colleagues or other departments
- Purchased or provided use of their personal equipment
- Used software/hardware from other campus locations
- None
- Other (please specify)

Section II

In this portion of the survey when we use the phrase “writing and communication software/hardware” we are referring to the technologies that you commonly use to complete coursework and assignments. Such technologies include everything from email to Web-authoring software to video editing and production software.

18. Using writing and communication software/hardware is a good idea.

strongly disagree	**2**	**3**	**4**	**5**	**6**	strongly agree

19. Writing and communication software/hardware makes work more interesting.

strongly disagree	**2**	**3**	**4**	**5**	**6**	strongly agree

20. Working with writing and communication software/hardware system is fun.

strongly disagree	**2**	**3**	**4**	**5**	**6**	strongly agree

21. I like working with writing and communication software/hardware.

strongly disagree	**2**	**3**	**4**	**5**	**6**	strongly agree

22. People who influence my behavior think that I should use writing and communication software/hardware.

strongly disagree	**2**	**3**	**4**	**5**	**6**	strongly agree

23. People who are important to me think that I should use writing and communication software/hardware.

strongly disagree	**2**	**3**	**4**	**5**	**6**	strongly agree

24. Professors have been helpful in my use of writing and communication software/hardware.

strongly disagree	**2**	**3**	**4**	**5**	**6**	strongly agree

25. In general, the university has supported my use of writing and communication software/hardware.

strongly disagree	**2**	**3**	**4**	**5**	**6**	strongly agree

26. I have the resources necessary to use writing and communication software/hardware.

strongly disagree	**2**	**3**	**4**	**5**	**6**	strongly agree

27. I have the knowledge necessary to use writing and communication software/hardware.

strongly disagree	**2**	**3**	**4**	**5**	**6**	strongly agree

28. Writing and communication software/hardware that I use at school is not compatible with writing and communication software/hardware I use at home.

strongly disagree	**2**	**3**	**4**	**5**	**6**	strongly agree

29. A specific person (or group) is available for assistance with writing and communication software/hardware difficulties.

strongly disagree	**2**	**3**	**4**	**5**	**6**	strongly agree

30. I could complete a job or task using writing and communication software/hardware if there were no one around to tell me what to do as I go.

strongly disagree	**2**	**3**	**4**	**5**	**6**	strongly agree

31. I could complete a job or task using writing and communication software/hardware if I could call someone for help if I got stuck.

strongly disagree	**2**	**3**	**4**	**5**	**6**	strongly agree

32. I could complete a job or task using writing and communication software/hardware if I had a lot of time to complete the assignment for which the software/hardware was provided.

strongly disagree	**2**	**3**	**4**	**5**	**6**	strongly agree

33. I could complete a job or task using writing and communication software/hardware if I had just the built-in help-feature available for assistance.

strongly disagree	**2**	**3**	**4**	**5**	**6**	strongly agree

34. I feel apprehensive about using writing and communication software/hardware.

strongly disagree	**2**	**3**	**4**	**5**	**6**	strongly agree

35. It scares me to think that I could lose a lot of information using writing and communication software/hardware by hitting the wrong key.

strongly disagree	**2**	**3**	**4**	**5**	**6**	strongly agree

36. I hesitate to use writing and communication software/hardware for fear of making mistakes I cannot correct.

strongly disagree	**2**	**3**	**4**	**5**	**6**	strongly agree

37. Writing and communication software/hardware is somewhat intimidating to me.

strongly disagree	**2**	**3**	**4**	**5**	**6**	strongly agree

38. I intend to use writing and communication software/hardware in the next 6 months.

strongly disagree	**2**	**3**	**4**	**5**	**6**	strongly agree

39. I predict I will use writing and communication software/hardware in the next 6 months.

strongly disagree	**2**	**3**	**4**	**5**	**6**	strongly agree

40. I plan to use writing and communication software/hardware in the next 6 months.

strongly disagree	**2**	**3**	**4**	**5**	**6**	strongly agree

CHAPTER	4
TITLE	Video for the Rest of Us? Toward Sustainable Processes for Incorporating Video into Multimedia Composition
AUTHORS	Peter J. Fadde Patricia Sullivan
OVERVIEW	Long the province of professional media producers, video production and publication suddenly seem to be available to virtually anybody. But the promise of video in composition comes with challenges, including how teachers with limited video abilities use video in their composition classes and grow a sustainable process of integrating video into multimedia composition. We offer a process for working with video in multimedia composition: ideate, locate, evaluate, and integrate. The complexity of teaching and creating video can be simplified, we argue, by focusing on one or a few components in a limited production process. To particularize the discussion, we consider new curricular tasks that scaffold video composition by providing a training wheels approach (e.g., Primary Access); a repository approach (e.g., An Adventure of the American Mind); and an imitation approach (e.g., following the formats of activism videos on YouTube). Our goal is to point toward sustainable processes for incorporating the powerful, but still difficult to manage, medium of video into multimedia composition—processes particularly useful to students and teachers with limited video experience.
TAGS	audio, collection, composition, copyright, distribution, ecology, evaluate, Fair Use, ideate, integrate, Internet, locate, multimedia, Patricia Sullivan, Peter Fadde, photo, PrimaryAccess, production, rhetoric*, self-publishing, social networking, software, sustain*, technical, technolog*, video, YouTube
AUTHOR BIOGRAPHIES	Peter J. Fadde is an assistant professor of Instructional Technology and Instructional Design in the College of Education and Human Services at Southern Illinois University. He teaches courses in instructional Internet applications, interactive multimedia, learning theory for instruction, instructional simulations and games, eLearning, and video production. Fadde's research interests center on training of expertise and expert performance, sustainable educational technology approaches, and the re-emergence of video in Web-based corporate communications and training. Fadde is co-coordinator (with Sebastian Loh) of the Collaboratory for Interactive Learning Research at SIU. Patricia Sullivan is a professor of English at Purdue University, where she directs the graduate program in rhetoric and composition and previously directed the program in technical writing. She teaches public rhetoric, research methodology, professional writing theory, computers and writing, and history of rhetoric. Sullivan was instrumental in starting Purdue's Professional Writing major and in crafting specialized areas of doctoral study at Purdue (Public Rhetoric; Rhetoric, Technology, and Digital Writing; Technical and Professional Writing). Sullivan's scholarly interests include gender and digital communication; the interplay of learned and public communication; disciplinary and institutional history/historiography; method, methodology, and notions of an academic field. Sullivan has published *Electronic Literacies in the Workplace* (with Jennie Dautermann, National Council of Teachers of English, 1996); *Opening Spaces: Writing Technologies and Critical Research Practices* (with James Porter, Ablex, 1997); *Professional Writing Online* (with James Porter and Johndan Johnson-Eilola, AB Longman, 2001, 2004, and 2008); and *Labor, Writing Technologies, and the Shaping of Composition in the Academy* (Pamela Takayoshi, Hampton Press, 2007).
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Video for the Rest of Us? Toward Sustainable Processes for Incorporating Video into Multimedia Composition

Peter J. Fadde
Patricia Sullivan

The 2006 purchase of YouTube by Google for 1.8 billion dollars dramatizes the evolving relationship of video and the Internet. After many years of limited Web presence, video rather suddenly has become much more visible on the Internet. Formerly the domain of professional video producers, video now is produced and published by innumerable Internet users. As the reigning king of media, video represents an empowering new media literacy (Selfe, 2007) for writers, students, and teachers. This turn to video offers multimedia composers a double-edged sword, though: On one hand, the most powerful of communications media has become a potentially prominent tool in the multimedia composer's kit due to searchable video repositories, inexpensive video-editing software, video-friendly Web platforms, and better Internet transmission speeds. On the other hand, video resources—when compared to other media such as text and graphics—remain difficult to gather, edit, and ultimately forge into a composition that is technically, aesthetically, and ethically pleasing. The key issue this chapter addresses is how students, practitioners, and teachers can best take advantage of the rhetorical attributes of video, without having to master a full technological and disciplinary skill set. We propose that a tried-and-true video technique, *repurposing*,[1] used in an accessible multimedia platform (Microsoft PowerPoint), helps make video possible in the arena of multimedia composition, and that possibility is the focus of this chapter. We examine repurposing video content for inclusion in multimedia compositions and describe a component approach to composing with video. We suggest building a frame to provide scaffolding for sustainable processes that can be used by instructors or composition programs across software generations.

We situate technology-related sustainable processes as flexible, and also as situated within the larger discussion of sustainability. Since the United Nations' Brundtland Commission on the Environment and Development (1987), sustainability has often been defined as development that, first, meets the basic needs of all and, second, extends to all the opportunity to grow and evolve within a system. The Yale Center on Ecology and the Law (2005) has quantified the connections of people, ecology, technology, and public policy through their ESI metric (Environmental Sustainability Index). Central to this metric is the observation that improvements in ecological sustainability—particularly in the policy area—are more likely to improve when the metric is time-based. The metric both allows for and encourages improvement over time. This temporal move is important to our view: Because we

[1] Central to the expanded use of video in multimedia compositions is the notion of repurposing, as it provides shortcuts to quality and at the same time offers the possibility of focusing on the rhetoric of compositional choices. In the field of commercial video, repurposing often means "taking a given property developed in one media form and repackaging it for sale in all the other forms possible" (Klinger, 2006, pp. 8–9) or selecting "segments from various sources to form a new piece of video is called repurposing" (Ahanger & Little, 1999). Public television has practiced this type of repurposing by making broadcast programs available to schools and libraries in videocassette and DVD formats (Nugent, 2005).

deal with software that quickly becomes obsolete, we need to think about specific moves as transitory, and move toward more rhetorical approaches as the bases of our sustainability. We thus identify rhetorical issues (such as consideration of audience) and ethical issues (such as the proper use of copyright-protected material) that inevitably become intertwined with technical issues involved in multimedia composition.

HISTORICAL PERSPECTIVES

Toward Accessible Video Production and Distribution

The 21st century "everyman" approach to digital video popularly displayed in YouTube has been extended into mainstream television through such events as the 2006–2007 contests for consumers to create SuperBowl XLI commercials; the National Football League, Frito Lay, and Chevrolet all used consumer-conceived advertisements (Poniewozik, 2007). One of these amateur-conceived commercials—a Doritos ad depicting the romantic tale of chip-munching pedestrian and driver meeting by accident—was named Best Video Ad of 2007 by *USA Today* (Petrecca, 2007). Those involved in instructional design and corporate communications remember that video production in the 1970s, 1980s, and pre-Internet 1990s was the province of professional video producers. Both internal (e.g., explaining effects of a corporate merger, or training employees in new technology use) and external (e.g., marketing a new product line) video communications were likely to be commissioned, because videos were expensive to produce. To cut expenses, footage or segments were often reused in new programs for different purposes—the footage and segments were repurposed.

Corporate video production did not disappear when video proved to be difficult to disseminate through the Internet or be included in PowerPoint slideshows, but it was used more judiciously. Video remained important to training, and instructional design researchers continued to study how to educate effectively via video. As Stephen Alessi and Stanley Trollip (2001) noted in *Multimedia for Learning*:

> The use of video is attractive to most designers and users. However, unless footage already exists, it is usually expensive to produce. Professionally produced video can cost many thousands of dollars a minute, with the price depending on the complexity of the set, the use of actors, and so on. Because of video's high cost, you must know ahead of time how much you can afford. In addition, you should include the cost of editing and digitizing. (p. 461)

Allessi and Trollip advised producers of instructional multimedia to be sure that "video is appropriate given the program's goals" (p. 424), and offered guidelines for using video in training:

- Use video for important information.
- Use video for demonstrating and modeling.
- Keep video segments short.
- Consider the expense of video production.

The use of video in multimedia programs has changed somewhat since the 2001 publication of *Multimedia for Learning*, but much of its advice holds true. Alessi and Trollip's recommendations were primarily based on economic constraints, but even as video becomes easier and less expensive to use, multimedia writers should still heed Alessi and Trollip's advice. (We might recall the early days of desktop publishing and Web site design, when non-professionals gained access to production tools formerly limited to professionals, which often led to overuse of aesthetically and rhetorically counterproductive “eye candy.”)

Today, because video production and distribution capabilities are increasingly available to non-professionals, the role of the aesthetic gatekeeper is challenged. Alessi and Trollip (2001) warned, “because of our exposure to television and the cinema, we are accustomed to high-quality video. Anything else we tag as home-video quality with a somewhat pejorative connotation” (p. 538). Although this has historically been the case, we think among some audiences, particularly younger audiences, the “home-video quality” often carries rhetorical weight related to authenticity. In a trickle-up effect, this sense of production quality is also beginning to shift, even at venues of high-level production; network television executives are trolling YouTube to come up with a new generation of video producers capable of communicating with a new generation of media consumers (Clark, 2007). In communications, writing, teaching, and training contexts, the sharp multimedia composer can take advantage of a YouTube aesthetic by producing low-cost videos that are not only adequate but sometimes optimal for relating to a young audience. This acceptance, even elevation, of the amateur aesthetic has made it possible for even the inexperienced student to produce effective multimedia compositions using video—if the composition is rhetorically right (i.e., credible and meaningful to the target audience). The real breakthrough, however, has not been technological, but rather rhetorical. Low-cost tools and accessible means of distribution have shifted at least a portion of the video production model away from expensive, professionally produced, technically and aesthetically high-quality video in favor of video that is, above all else, authentic.

Video Composing and Composition Studies

In composition studies, particularly from the perspective of the computers and writing community, video and other mass media formats have a history in our classrooms. *College Composition and Communication* has published articles that focus on the use of popular culture (including and often featuring film, television, and other video) since the early 1950s. In 1952, for example, *College Composition and Communication* published a report of a workshop at the Conference on College Composition and Communication promoting newspapers, periodicals, and motion pictures as material for a communication course, which was followed in 1956 by a workshop on mass media as a subject of study (“Workshop Reports,” 1952, 1955). These and other early arguments for the use of popular culture and the media of film and television centered on increasing student engagement in communication classes. By the second workshop, though, a survey of where mass media appeared in classes suggested that mass media was used in composition and rhetoric courses as well as in communication classes. These and other records of the 1950s and 1960s suggest that composition embraced film, television, and video as content for discussion and prompts for writing. These reports further suggest that many instructors used media as a way to engage students with writing.

As Paul Briand suggested in 1970, multi-media use helped students become “turned on.” Now, in the 21st century, the technical abilities needed to merge writing with video to build multimedia compositions are more accessible, and many of us have considerable experience with digital writing and its distribution via the Internet. Further, we know that many students publish their multimedia projects online on YouTube, MySpace, and Facebook.

Multiple avenues of self-publishing multimedia compositions in popular and searchable spaces opens a new public to students; they no longer have to write letters to the editor if we want them to publish activist texts. Take, as one example, videos on YouTube about Hurricane Katrina (there were almost 8000 posted by March of 2007). These run the gamut of responses—personal to professional, amateur-quality to high-quality—and include slideshows, interviews, memoirs, tirades, calls to activism, copies of television news segments, satire, music, and despair. One homemade video posted by Chelsea 13 (http://www.youtube.com/watch?v=8Vg_9EQYZxA; Ross, 2006) addresses relief efforts still needed, and urges viewers to contribute to Amnesty International. It is moving, repurposed, and typical of what a first-year composition student might produce as a multimedia composition. It has the possibility of reaching hundreds, even thousands of viewers, and offers the further possibility of moving them to act.

Although multimedia composition assignments obviously do not need to involve civic engagement, as the Hurricane Katrina video suggests, YouTube constructs a new (and youth-oriented) public available to those writing teachers who view civic education as a key component of their composition instruction. Because mass media has contributed to the public's elusiveness, civic engagement is more complicated and multi-faceted these days; that is, in our contemporary media culture, it is difficult to identify a "public," and it is difficult to speak to that public in a mass media context. Susan Wells (1996) articulated this difficulty: "Rhetoricians and compositionists have turned toward the public, for the best of reasons. But we have some problems locating the public—knowing exactly where we should turn. . . Our encounters with even a local civic space. . . are discontinuous and associated with crises" (p. 325).

Some in composition studies have long suspected that technology is important to locating a public culture for composition: note Edward Corbett's (1967) praise for Marshall McLuhan's insight into the technological culture of the 1960s, calling for *Understanding Media* to be required for teachers of composition. Today, understanding media includes social computing technologies as constructions of important civic forums. Yes, technology has and continues to offer composition studies public forums that require text-based writing—email, discussion lists and other forums, Web pages, blogs—and has amped up the possibilities for linking composition classes and public discussion with the emergence of social networking sites (e.g., Facebook and MySpace). We see video-inclusive multimedia compositions poised to further bring writing into these emerging public forums—social computing that builds community by making and sharing videos. Video publishing on social networking sites, including YouTube, provides students with models of and a target audience for socially engaged multimedia compositions.

The Rhetorical Potential of Video Composing

Given the rhetorical potential of using video in multimedia compositions to reach broader publics than the classroom, how might we proceed, particularly if we are new to using video? With video production and publication capabilities increasingly available, we want to tap into the rhetorical power of video. However, a sustained rather than a merely fashionable use of video in multimedia composition teaching and practice requires that video be used within our accepted pedagogies and curricula. Composition teachers must see the value, the appropriateness, the context, and the feasibility of incorporating video in composition. We hope to have addressed issues of value and appropriateness; we now focus on issues of how to feasibly fit video into the context of composition studies.

One way to incorporate video is to embrace the repurposing of existing media, as we have described. Although the use of copyrighted materials is controversial, multimedia composition in formal school settings is clearly covered by educational Fair Use exemptions (see Appendix 1). Along with repurposing, we suggest that teachers can simplify and shape the use of video by cutting out some parts of the production process. If, for example, the class is interested in creating a montage of images (as many of the Katrina videos do), the teacher might cut out part of the *location* process by supplying pointers to hundreds of pre-selected video clips and digital still images so that students do not have to spend a large portion of their time collecting materials, but rather focus on choosing and sequencing materials. Teachers can thus shape processes to focus student work on what is needed for quality engagement. The rest of this chapter addresses the question of how to proceed when students are new to writing with video by developing a general—and, we hope, sustainable—process for integrating video into the writing of multimedia compositions: ideate, locate, evaluate, and integrate. We describe three potential responses to incorporating a new approach into a composition classroom:

1) Start by teaching some general concepts inside a confined environment, taking an initial, supported learning approach like the one taken in PrimaryAccess, a Web site that lets young students use historical photos to create mini-documentaries.

2) Build a collection of video, audio, and photo materials that students will choose from to shortcut the process of gathering video and other multimedia materials. If we develop a corpus for a particular assignment, or use a database of materials such as the Library of Congress' Adventure of the American Mind, we can boost the performance of students with little video experience.

3) Help students to analyze and experiment with the approaches of simple but well-crafted videos they may find on Google Video or YouTube.

TOWARD A SUSTAINABLE PROCESS: IDEATE, LOCATE, EVALUATE, INTEGRATE

If teachers are going to edit their current pedagogies to include video-based (or video-enriched) multimedia composition, they need to have confidence that they can keep the focus on the writing dimensions of the multimedia project. There are many permutations in ideating, locating, evaluating, and integrating multimedia—all of which are amplified when dealing with video. The considerations and decisions involved are often technology-based, as we discuss below, but ultimately tap into the traditional concerns of writing, rhetoric, and instructional design: What is the purpose? Who is the intended audience? What are the resources and constraints of the producer? The audience? What moves need to be made to persuade the intended audience? To inform that audience?

A sustainable process for incorporating video into multimedia compositions raises these questions and can be consolidated around the four stages. Although these stages work in very much the same way for all types of repurposed multimedia elements (e.g., graphics, photographs, music), we focus here on video, because video production has become increasingly available to students and other non-professionals, because it draws upon other media, and because it can be particularly challenging to work with. Our emphasis is on simplifying the complexity of video to generate a more sustainable learning environment (Gresham, 1999).

Teachers and students new to video work need to begin by reducing the scope of the production process; we thus recommend a focus on repurposing existing video. Repurposing processes can be organized using a somewhat linear rubric if composers remember that sometimes work starts in different places, and often happens iteratively back and forth across the stages:

- **Ideate:** Students explore ideas for the project and complete a preliminary writing task such as a storyboard or a script.

- **Locate:** Students search for video clips appropriate for the chosen theme and audience.
- **Evaluate:** Students evaluate the video clips they have gathered for their ethical, rhetorical, aesthetic, and technical suitability for their projects.
- **Integrate:** Students insert video into their multimedia composition in rhetorically, ethically, aesthetically, and technically sound ways.

Appendix 2 highlights the challenges that accompany each stage (lest readers think the stages are as simple or as clearly delineated as they sound). Although the goals of each stage are straightforward, both the technical and rhetorical challenges are impressive, and these challenges force the stages to be more iterative than linear. For example, the goal of the first stage (ideation) is to explore issues and develop an executable idea for the project. But some students who know little about "writing" a video may need to spend time locating some typical video formats to imagine a workable structure for their project. Further, in the second stage, the goal is to locate video appropriate for the multimedia composition (evaluation) and capable of being downloaded and manipulated to fit into the multimedia composition format (integration). Conversely, evaluation of video materials depends on availability (location) as well as appropriateness. Considerations of integrating video material depend on what material can be located and deemed appropriate as well as legal to use (see Appendix 1).

As will be described in the assignment examples, teachers can elide or scaffold the multimedia composition process by supplying the labor and judgment involved in one or more of the stages. A teacher could, for instance, also have students focus on locating and evaluating materials, but scaffold the integration process by involving instructional support services in converting found video material to the desired digital file formats. In any case, these four stages of repurposing create a helpful heuristic for the classroom and for project processes.

Ideate

Ideating starts a project and resembles the typical invention activities writing teachers typically deploy, but with a twist. Because some of the argument is carried by yet-to-be-found multimedia elements, not all of the idea is written from the start. This means that students must flexibly imagine both the points they will make and also the shape that will be taken as they craft their multimedia compositions. Because the projects will develop as media is selected, teachers probably will decide that a project proposal or vision document is needed to manage that development. Some may want students to develop storyboards for the project—matching ideas, text, and imagined video/photos in a scene-by-scene fashion (Fadde, 2007). Others may want students to write a preliminary script and identify the types of media they will need to find. Student ability to envision the product rests in their skills at imagining their primary audience's rhetorical needs and their audience's likely technical expectations for a multimedia composition.

If students have trouble working from concept through to composition, ideation may also include deconstructing existing multimedia compositions. Examples of produced multimedia compositions may be drawn from YouTube or from cable television news features, which can be found on official sites such as CNN.com or on repository sites such as Blinkx. Students can discuss the target audience and rhetorical purpose of example pieces and then imagine the process of ideation in which the multimedia composer would have engaged.

Locate

In the past few years, video repositories have become searchable and browsable because the (previously Macromedia, now Adobe) Flash video format supports database organization and video streaming. These video repositories are typically open to the public (although some do allow for password-protected or social-network-oriented viewing) and assert limited responsibility for videos posted by users. For professional and corporate users, there are also commercial video repositories that sell professionally produced video segments to subscribers. Thus, locating usable video objects is much easier and smoother today, compared to even just 5 years ago. In the midst of myriad video objects, rhetorical choices become all the more central to the process of locating video content appropriate to the points students intend to make.

The most visible of the searchable video repositories, especially for students, is YouTube. However, there are other repositories—both free and fee-based—of searchable video on the Internet. As with research in more familiar text-based media, students should search a variety of sources to access a range of material. Further, students searching one repository will not always find appropriate material for their current projects; this limitation, ideally, allows them to question the repositories and to understand that repositories organize content in ways that disclose philosophical stances. Blinkx, for example, is a portal that accesses other repositories for a range of video content. Blinkx also contains a wider range of amateur-to-professional video clips than most, as is seen by searching Blinkx with the term “YouTube”: it locates a Reuters produced news feature about Viacom suing YouTube over the posting of copyrighted videos in addition to other YouTube entries such as individuals’ video comments on the lawsuit. But Blinkx also reveals what it thinks of the types of video content in its repository: the five groupings of sources (including logos of each video service that fits into each category) are News, Viral & Garage, Entertainment, Information, and Commercials. When you choose to search in “Viral and Garage,” you search Web Video, Logs, Selfcast, YouTube, Revver, Google, Break.com, Trouble Homegrown, MySpace.com, and Podcasts.[2] By contrast, YouTube, an open repository to which anyone can post video is “populist” and interested in creating a social community of video uploaders and viewers. Each includes the number of times it has been viewed, the number of ratings, the number of times it was marked a favorite, and the comments viewers have made about it.

Part of location also looks ahead to integration. Many of the repositories have browse and search functions. With the proper techniques and software, video clips can be downloaded from many repositories, but the process is different for Mac and PC computers and often requires a good amount of experimentation or consultation with a knowledgeable technical support person. There are differences between video repositories in the technical quality of videos and also in the ease with which video can be downloaded. For example, Google Video has higher technical quality and easier download capability than YouTube, but has far fewer video clips.

The second way of locating existing video material is ripping the video from sources such as videotape and DVD. Multimedia composers often want to rip content from copyrighted sources. Students also might record television programming to videotape, DVD, or DVR with

[2] Like all Web-based resources, the particular sites referred to here are likely to change or even disappear over time. Specific sites are therefore meant to be used as illustrative examples of the different types of video databases that students must learn to research, in the same way that they must learn to differentiate text-based databases, both commercial and non-commercial.

the intent of excerpting portions for inclusion in a multimedia composition. Legality depends on the context of the use and the publication. In an educational context, Fair Use (see Appendix 1) applies when excerpting copyrighted material for purposes of critique or parody. Although Fair Use guidelines are not legally binding, they provide accepted approaches for using copyright-protected work in a student- or teacher-produced multimedia composition used in the classroom. However, if students post school-based multimedia compositions on public venues like YouTube, educational sites like TeacherTube, or semi-public venues like Facebook, then the application of Fair Use guidelines is murky (see Westbrook, 2006). Nor is it clear what institutional responsibility a school or teacher has for a student publicly posting a school project covered by the Educational Fair Use exemption in the classroom setting.

Evaluate

Evaluating video segments involves three types of issues: ethical, technical, and rhetorical. Each found video clip should be evaluated in terms of its legality, its technical aspects, and its fit with the emerging argument planned for a multimedia composition. When students have located a set of potential video materials for their current projects, they then turn to this more exacting stage in the video-composition process.

Legal evaluation is somewhat of a moving target, because the laws keep changing as Internet innovators develop new ways to use and display copyrighted material. We suggest that multimedia composition projects include a discussion of educational Fair Use and the balanced rights of content creators and consumers. Although Fair Use addresses most uses of copyrighted materials in educational contexts, students should not assume that such exempted uses of copyright materials can be carried over to business or personal multimedia compositions. Because the primary goals of multimedia composing are to increase student media literacy and understanding of the rhetorical aspects of media, teachers should not feel restrained by copyright issues in the creation of in-class projects (because of educational Fair Use), but should help students learn why and how to determine the ethical and legal use of copyrighted materials outside of the safe haven of the classroom.

Technically, the evaluation questions concern whether the video can be harvested from its source in a workable format and what the final production quality of the video will be. Rhetorically, if students are creating multimedia compositions intended to persuade fellow students, then video clips downloaded from *YouTube* may be acceptable, even optimal choices. Indeed, the intended youth audience may assign more credibility to a less professionally produced video segment. However, if the audience for the student’s multimedia composition is a local school board, then a clip from CNN may well have more credibility. Certainly, these decisions link the technical and the rhetorical.

Guidelines for finding, using, and citing print sources apply to video elements. Students need to decide which source materials to use and how much of the original video source to excerpt from a larger video segment. Evaluation considerations encourage students to push past the first video they locate and to search for reasonable segments for the audience they intend to reach (this may feel familiar, as many of us have experience with students doing research by searching Google, and then using and citing the first few sources on the search results list). Evaluation also asks students to identify inappropriate video clips for their audience (even if they are appealing to the student). This process can nudge students toward assembling a reasonable pool of clips. The rhetorical evaluation also brings up aesthetic issues, because, in our experience, these issues are intertwined for students. We have seen instances of audiences at odds over rhetorical versus aesthetic issues. For example, when a master’s student writing a thesis in communication developed a multimedia DVD for the university’s softball team, the photography member of his committee wanted the DVD edited to excise low-quality video (e.g., clips where team members had their backs to the camera). The audience for the DVD (parents and fans of the team) then complained that this important material was not included. Professionally preferred standards and aesthetics can war with audience-preferred content.

Integrate

Integrating video into a multimedia composition involves issues related to locating and evaluating video. One key question that extends the questions posed in the earlier steps is how much of an original video to use in a multimedia composition. This consideration can provide an opportunity for a teacher to discuss appropriate use of source material regardless of the media format. Both Fair Use suggestions and principles of composition suggest quoting a limited portion of the source material rather than using the material in its entirety. The compositional issues in integrating multimedia elements, including video, focus on creating narrative meaning and rhetorical message by blending various media. Students need to consider the affordances of various media for conveying detailed information and emotional impact. That is, students must decide not only how much video to use, but also what other media modes can best help to compose a persuasive message.

Although media elements—especially video—are easier to locate and integrate into multimedia compositions than in the past, integration can still be a confusing and frustrating process. Teachers may require assistance from technical support staff (official or unofficial) to create a workflow. However, once a process for locating, evaluating, and integrating media is established, it can be applied fairly routinely. The payoff is that students develop skill and confidence in composing with multimedia. They become more knowledgeable as consumers of media and more empowered as producers of media.

MULTIMEDIA COMPOSITION

There are a variety of approaches to creating multimedia compositions that incorporate a range of media elements. One is to use a video-editing program—such as the iMovie (Mac) and Windows Moviemaker (PC) programs, now bundled with most computers—as an authoring tool. Another approach is to mix-and-match—using Microsoft PowerPoint for authoring and converting to video or Adobe Flash format for Internet distribution. As is often the case with technology, we are in a transitional stage. Video-editing programs can be clumsy for generating graphics and text. PowerPoint is clumsy for incorporating video. Flash-based authoring programs such as Adobe Captivate are evolving, and thus sometimes glitchy or otherwise unstable. The choice of multimedia authoring system should be based on the experience and skills of the teacher and the students, existing software and hardware resources, and the nature of the multimedia compositions. Video-editing software is appropriate to use as an authoring tool to create multimedia compositions when a substantial amount of the source material is video and/or the intended distribution is a “hard” video format such as DVD. In other situations, the compositional elements primarily consist of non-video media such as photographs (digital and analog) and graphics to be imported along with text to be added. Distribution will likely be via “soft” video on the Internet rather than to a DVD. Such compositions can often be authored in Microsoft PowerPoint and then saved as a video format for Web distribution.

Video editing and creation is, in many cases, the province of a distinct course in multimedia production. The composition teacher is challenged with teaching practices of incorporating video without overwhelming the teaching of composition. We highlight the PowerPoint-based approach here because it can be added to existing units on composing slideshows for presentation support (Fadde, 2008). Further, PowerPoint is ubiquitous in both academic and professional contexts, and will likely remain in popular use even as a variety of multimedia and Web-authoring applications emerge in the marketplace. As shown on increasingly popular sites such as SlideShare.net, PowerPoint-to-video can be a simple and effective communication format. The Hurricane Katrina Relief (Ross, 2006) multimedia composition by Chelsea 13 uses digital photographs in a slideshow format, which may have originally been produced in PowerPoint. That composition was converted to a video format and uploaded to YouTube, converting the PowerPoint-generated video file into a Web-ready Flash video file (.flv).

The alphabet soup of media file formats can become confusing, but understanding file formats is essential to developing a sustainable process for repurposing media elements found on the Internet or through other sources. As we have noted throughout, video is much easier to manage than before (when it was essentially the province of media professionals), and many students and teachers bring video skills to the composition classroom. But for the rest of us, video can be clumsy and confusing to work with. In some cases, developing a video composition process involves a teacher working with information technology support personnel in a computer lab or other on-campus instructional support space. In other cases, however, a teacher will need to access unofficial support (such as a knowledgeable colleague, student, or community professional) in building a sustainable video process. It's not necessary that teachers become experts on the process, but it is important for teachers to communicate the requirements of a multimedia composition process. Our goal here is to demystify issues involved to video composing. The sustainability challenge here is to be detailed enough for teachers to draw from our suggestions, while avoiding specific software recommendations that become quickly dated. Appendix 3 offers a sketchy but helpful introduction to general technical considerations and file format standards.

MULTIMEDIA COMPOSITION ASSIGNMENTS

We offer three approaches as examples of how teachers might orchestrate multimedia composing assignments that maximize student learning in the context of composition studies. These approaches attempt to increase the feasibility—and therefore sustainability—of video-inclusive multimedia composition assignments by repurposing rather than originating video footage and by focusing on individual components of the ideate-locate-evaluate-integrate process.

Start by teaching some general concepts inside a confined environment and take an approach similar to the one taken in PrimaryAccess. PrimaryAccess is a Web site that strictly controls multimedia composition so that students can learn the concepts at the same time they produce side-by-side images and text, is a means for teachers to focus and facilitate student efforts in multimedia composition. A teacher can create an initial multimedia writing assignment that provides students with a selection of digitized primary sources from the Civil War era and then have students choose a theme (e.g., slavery or military campaigns) to write and illustrate. A second multimedia writing assignment might make students responsible for locating images using the Adventure of the American Mind repository of Library of Congress digitized primary sources. In the initial PrimaryAccess assignment, students are provided text to edit and rearrange to match with the sequence of images selected. In the second assignment, students write their own narration—requiring research beyond the information in the PrimaryAccess or Adventure of the American Mind sites. Assignments such as these display a resource-rich scaffolding approach and are particularly useful in classes that build student multimedia sophistication, or in settings where there is limited time to devote to the project.

Craft video-production competitions and showcases; build a collection of video, audio, and photo materials that students will use to shortcut the process of gathering video and other multimedia materials. Another approach teachers can take to support and focus student work is through the construction of a local photo and video collection. This might be a “live” collection, to which students and instructors continuously contribute new footage, photos, and even multimedia compositions. A number of assignments might be crafted out of this collection, including products such as YouTube-style videos for entry in a contest, or a multimedia composition intended for play on a kiosk.

A competition-styled event where students compete to contribute to a living repository may be particularly attractive for students in majors where they will be expected to frequently craft and present slideshow presentations. Extending these skills to creating a video production using slideshow software is thus a valuable skillset. Assignments that support student contest entries might begin with a viewing and discussion of model videos. Crafting multimedia compositions intended for kiosk viewing is perhaps—unless it is limited to a set of issues, purposes, and occasions—the least constrained of the options and thus the most difficult to ideate, for the composition will only be bound by the student imagination. Again, the rhetorical challenge is to understand and reach a particular audience with a particular message.

Have students copy the approaches of well-crafted public message videos. A third approach is to have students locate multimedia elements (graphics, video, interviews, music) from various sources and create a “public rhetoric” multimedia composition on an important issue intended to affect the awareness, knowledge, and beliefs of a target audience. The teacher might direct students to use the Hurricane Katrina Relief video as their model video. Although the 2-minute movie by Chelsea 13 (Ross, 2006) is moving, it isn’t moving because of its production quality; rather, it is moving because of the tragedy it responds to and the sentiment it conjures.

It is the teacher’s role to balance the scaffolding and constraining of student creativity in selecting and arranging materials and topics for a multimedia composition assignment. We suggest offering or leading students to find a number of different compositional models and topics, and discussing their structure and rhetorical impact. It is also important, if you are using the assignment to probe public/civic rhetoric, that you stipulate that their multimedia compositions address important public issues. Teachers thus might ask the class to suggest one or two issues they might probe, so that the research needed to produce a quality composition might be shared and managed.

SOME FINAL THOUGHTS

This chapter has attempted to entice more composition teachers to include video in the composition process. In part because of lessening technological constraints and in part because of the reduced gate-keeper role of professional video, the rhetorical power of video is available to more of us than ever before. Video is an important new media literacy worth the effort of establishing sustainable video-inclusive multimedia composition assignments. As we began writing this chapter, we desired to make the use of video in multimedia composition somewhat turnkey—hence our focus on repurposing video (rather than creating it from scratch), our description of structured stages for the processes of incorporating video, and our suggestions of ways to encourage creativity by focusing student video use. Although it does not really surprise us that our approaches fall short of a turnkey solution, we hope to have identified some more general, and therefore more sustainable, approaches. We have discussed some useful strategies for managing video and establishing approaches to support student gathering and repurposing. This sort of strategic approach builds flexible and sustainable processes for teachers to use in engaging students in multimedia composing.

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Appendix 1. An overview of educational fair use (adapted from Education World, 2007).

The Fair Use doctrine was created to allow the use of copyrighted works for criticism and commentary, parody, news reporting, research and scholarship, and classroom instruction. There are four factors involved in evaluating Fair Use. Under each factor, a particular use of copyrighted materials is more likely to be considered to be Fair Use if:

1. Purpose and character of the use:
   - Copyrighted works are altered significantly.
   - Copyrighted works are used for nonprofit or educational purposes.

2. Nature of the copyrighted work:
   - Copyrighted works are published.
   - Copyrighted works are out of print.
   - Copyrighted works are factual rather than fictional.

3. Amount and substantiality of the portion used in relation to the work as a whole:
   - A smaller percentage of the copyrighted work is used.
   - A less significant portion of the copyrighted work is used.

4. Effect of the use upon the potential market for or value of the copyrighted work:
   - Copyrighted works are used for another purpose or designed to appeal to a different audience.

Appendix 2. Goals and challenges of the four-stage process.

	Goal of Stage	Technical Challenges	Rhetorical Challenges	Iterative Challenges
Ideate	explore and develop an executable project idea	• create storyboard • find material to aid understanding of issues	• translate ideas into sequenced presentation • identify main audiences • identify points key to audiences • understand video formats to be used	• tendency of students to skip this step (due to desire to jump into technical production) • risk of selecting the first idea suggested (which later may prove to be too narrow)
Locate	find existing video materials for the project	• locate Web and other sources • identify exportable video • consider legal and ethical challenges related to using video	• identify points that need video elaboration or backing • consider legal and ethical challenges related to using video • assess aesthetic issues • evaluate credibility of videos found	• may find little usable material and need to refine planned argument • may find only one side of an issue represented in accessible video
Evaluate	decide which video materials to use and how to use them in the particular project	• consider level of expertise needed to work with materials found • assess how much work is needed to move each clip into the project's platform • select video materials of appropriate file format and resolution	• overcome desire to use first video found • identify video not appropriate to the audience or the message • assess effectiveness of video at making points • assess aesthetic issues • evaluate credibility of videos found	• might discover that project is not possible as conceived (due to video quality differences, aesthetic issues, quantity of material, credibility, etc.) • might realize that not enough material has been gathered
Integrate	insert video into project in both technically and rhetorically	• import materials into editing software; trim and compile clips • export edited video in an	• choose appropriate length and content of video "quotes" • attribute video sources	• may need to move back to evaluation if materials now prove problematic • may need to locate more clips if some

	sound ways	optimal file format for the multimedia composition platform • import video into composition and connect video to other aspects of the project • provide video replay controls (pause/play, fast-forward, volume)	• use video judiciously for impact, illustration, or demonstration.	prove to be inappropriate • may need to assess video in its entirety to identify weak points, or areas that need more development or support

Appendix 3. General technical processes used in repurposing

The options listed below provide a guide rather than a recipe for building a sustainable video repurposing process. Descriptions favor clarity over completeness. For more complete information on video issues there are numerous on-line sources to informally research video file formats and software add-ons (e.g., Baja, 2004).

Download Video Clip from Web site:

1) Drag video “window” from Web site to desktop. If the extension on the file name of the video clip that appears on your desk top is .mov (QuickTime) or .wmv (Windows Media) or .avi, then you have an editable (and PowerPoint linkable) video file. Or,
2) Open the video (double click). Save to desktop as QuickTime (.mov) or Windows Media (.wmv), or .avi format if possible. If you computer does not have these options then save as default format.
3) Save at highest resolution possible.

Download Video Clip from Video Repository:

1) Find and download a video download/conversion tool. Some are available as browser add-ons. Some are stand-alone applications. Many are available for PC, either free or minimal fee (e.g., $49). Only a few are Mac compatible. Download and conversion tools can be separate or combined. Or,
2) Access a download/conversion Web site. Copy-and-paste the URL of the target video clip. Download as .mov, .wmv, or .avi file format.
3) Save at highest resolution possible.

Download Video Clip from Video Sources (DVD, DVR, videotape):

1) Applications are available to rip video from DVDs, but the files are still large, the transfer times are long, and the results are inconsistent. The ripped file must usually be converted into .mov (QuickTime) or .wmv (Windows Media) format to import into PowerPoint or a video-editing program. Or,
2) DVD players, digital video recorders, and VCRs have analog Audio/Visual outputs (yellow for video and red/white for audio). Hardware “transcoders” ($100–200) can be take analog audio/video input and output via Firewire into a computer and video-editing program. This process of “digitizing” has been used for many years to transfer analog video to computers, and is sometimes still the easiest and most controllable way to import video from a DVD.

Import Video Clip to Video-editing Program:

1) Bundled video-editing programs, such as Apple iMovie or Windows MovieMaker, can be used for trimming video clips. Check what formats the video-editing program imports (e.g., QuickTime .mov files for iMovie).
2) If trimming a single clip, load clip into editing timeline and cut excess video. Export video clip back to the computer desktop in the optimal file format and resolution.
3) If compiling multiple clips, edit in timeline and export as single file.

Import Video Clips into PowerPoint:

1) If video clips are .wmv (Windows Media), then Insert > "Movie from File." A window optimized for the resolution of the video clip will open on the PowerPoint slide. The video window can be resized and moved on the PowerPoint slide. The video can be set to play automatically or with mouse click on the video window. Some versions of PowerPoint can embed some .mov (QuickTime) video in the same way.
2) Add video playback controls on the PowerPoint screen (Slide Show > Action Buttons > Movie). It is not possible to "mark" beginning and end points for a video clip—the file will play in its entirety or until the user selects to proceed to the next slide.
3) If the video clip is in a file format that the version of PowerPoint does not import, then place the video clip(s) in a folder with the PowerPoint and make a link to the clip from within PowerPoint. When the link is clicked in the PowerPoint, a new window will open to play the video.

The finished multimedia composition in PowerPoint can then be converted to other formats to improve distribution, especially over the Internet. A variety of software applications (including a number of inexpensive, dedicated applications in addition to full-featured applications such as Adobe Captivate and TechSmith Camtasia) can convert a PowerPoint composition to a Flash video. Benefits of the Flash format are smaller file size, consistent display across browsers and computer platforms (sometimes a problem with PowerPoint), and increased integrity of the multimedia composition (viewers can view it, but not edit it). The PowerPoint can also be saved as a Windows Media or QuickTime video file, both of which are much bigger than a Flash file, but can be uploaded to video repository Web sites—where it will be converted to Flash video.

CHAPTER	5
TITLE	Portfolios, Circulation, Ecology, and the Development of Literacy
AUTHOR	Kathleen Blake Yancey
OVERVIEW	All portfolios participate in and support a curricular ecology. In the case of print portfolios, the ecology tends to reward process. In the electronic portfolio model, the curricular ecology expands in three ways: (1) in terms of kinds of texts (image, audio, video, alphabetic); (2) in terms of contexts, given the availability of an almost infinite number of contexts on the Web; and thus also (3) in terms of potential audiences. At the same time, a single vehicle, even an electronic portfolio, cannot operate in all curricular ecologies; rather, each model assumes a specific curricular ecology. One such ecology is oriented to *processes* composers engage in: it includes the verbal but tends to privilege the visual as a means of documenting practices contributing to composition. A second ecology is oriented to ways that the *structure* of a digital portfolio can foster learning: it privileges scaffolding and context, and, through arrangement, seeks to construct a student in explicit ways. A third model of eportfolio is not based in print, but is from the beginning electronic; it is keyed not to revision, but to a *reiterative process* in which one portfolio acts as (1) foundation for other portfolios; (2) source of material that can be re-mixed for successive portfolios, and (3) site and occasion for interacting with others inside and outside of school. The hope of this model is that it leads to a self-sponsorship of writing, thinking, and representing self in a self-designed, dynamic, continuing ecology of learning.
TAGS	audience, Catalyst, circulation, Clemson, compos*, composer, curricular, dialogue, digital, ecology, electronic, eportfolio, first-year writing, flexible, iteration, IUPUI, Josh Reynolds, Kathleen Blake Yancey, literacy, map*, model, portfolio, print, reiterative, samplers, self-sponsorship, structure, sustain*, technolog*, template, text*, University of Washington, writ*, writing program
AUTHOR BIOGRAPHY	Kathleen Blake Yancey is Kellogg W. Hunt Professor of English at Florida State University, where she directs the Graduate Program in Rhetoric and Composition. As President of the National Council of Teachers of English, she has focused attention on 21st century literacies and on the role of writing in multiple sites across the country. A Past Chair of the Conference on College Composition and Communication and a Past President of the Council of Writing Program Administrators, Yancey also co-founded and co-directs the International Coalition on Electronic Portfolio Research (http://incepr.org). Yancey's research focuses on composition studies generally; on writing assessment, especially print and electronic portfolios; and on the intersections of culture, literacy and technologies. She has authored, edited, or co-edited ten scholarly books and two textbooks as well as over 65 articles and book chapters; several of those volumes have focused on portfolios, writing assessment, and reflection. Yancey's current projects include *Composition in a New Key* (forthcoming).
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Portfolios, Circulation, Ecology, and the Development of Literacy

Kathleen Blake Yancey

> *A portfolio is never neutral: it assumes a circulation of texts, a set of relationships, and an ecology of learning.*

During the last 25 years, writing teachers have engaged in three remarkable shifts in their teaching and assessment practices. Specifically, they have moved from

1. the assignment and review of single, finished print texts to
2. the review of multiple print texts, including drafts of finished texts, inside a portfolio to
3. the review of multiple kinds of (sometimes print and) digital texts linking work inside school to that outside school and linking composers and texts to multiple contexts and audiences.

In terms of what we might call the *circulation* of texts, these shifts signify in two ways. First, collectively, the shifts mean that a single channel of communication, between teacher and student, has been multiplied, inside the portfolio specifically—be it print or digital—to include many channels: between students and other students, between students and other teachers, between students and audiences outside of school. Second, the individual text-without-context has been replaced by the text-with-its-own-context of drafts and notes and composing and thinking, which itself has been replaced in turn by multiple *kinds* of texts in dialogue with each other in multiple *kinds* of contexts. An electronic portfolio, with drafts and outtakes and reflective commentary, assembles and articulates *its own ecology of composing and composer*. Like a Web site, however, this portfolio's "system of circulation" can also include Internet-based and interactive links, contexts, and audiences. Circulation thus refers both to the distribution of texts and to the relationships among composer, texts, and audiences.

Implicitly, inside each of these portfolio models is likewise a model of *composing* assuming a kind of textual *circulation*, which itself is one dimension of a *curricular ecology*. In the "finished print model," the curricular ecology is tutorial in nature: focused on a single student submitting to a single audience a single completed document. In the print portfolio model, the curricular ecology is more social, encouraging writers to engage inside a limited discursive space, that of the classroom, as they work together in drafting and re-drafting situations to create a variegated portfolio composition that is itself an ecology of texts showing development and achievement. In the electronic portfolio model, the curricular ecology expands in three ways: (1) in terms of kinds of texts (image, audio, video, alphabetic); (2) in terms of contexts, given the availability of an almost infinite number of contexts on the Web; and thus also (3) in terms of potential audiences. Ironically, although such widening is often claimed to be an advance on earlier ecologies of learning, it also means that, given diverse possibilities, creating a rhetorical situation for a Web-sensible digital portfolio (Yancey, 2006a) is a fundamentally new composing task.

> **Ecology . . .** is the scientific study of the distribution and abundance of living organisms and how the distribution and abundance are affected by interactions between the organisms and their environment.
>
> (Wikipedia)

At the same time, a single vehicle—even an electronic portfolio—cannot operate in all curricular ecologies, and a review of current models of electronic portfolios demonstrates that each model assumes a specific curricular ecology. One such ecology is oriented to *processes* composers engage in, and it tends to privilege the use of the visual to document practices that contribute to composition. A second ecology is oriented to ways that the *structure* of a digital portfolio can foster learning, and it privileges scaffolding and context, and, through its structure, seeks to construct a student in explicit ways. A third model of eportfolio, such as that developed at institutions such as LaGuardia Community College, at Clemson University, and at Florida State University, is not based in print, but is from the beginning electronic; it is keyed not to revision, but to a *reiterative process* in which one portfolio acts as (1) foundation for other portfolios; (2) source of material that can be re-mixed for successive portfolios, and (3) site and occasion for interacting with others inside and outside of school. The hope of this model is that it leads to a self-sponsorship of writing, thinking, and representing in a self-designed, dynamic, continuing ecology of learning.

Centers of activity, where the paths of many people come together in concentrated fashion, are important places economically and socially. . . Intricate minglings of different uses in cities are not a form of chaos. On the contrary, they represent a complex and highly developed form of order. (Jacobs, 1992)

Forget your playlist. Put your passport on shuffle.

(Delta.com)

To foster learning, the ecologies of eportfolios are *not* exclusively online; rather, when situated in face-to-face occasions—for instance, student presentations of their portfolios and portfolio gallery events—students develop a kind of authority and expertise that seem directly related to the effects of mixing the eportfolio with and into a real-time rhetorical situation. As in the case of other artifacts of literacy—and here, in this chapter, the case of embroidered samplers will be instructive—eportfolios, too, flourish when the ecology of learning that contextualizes and interacts with them is a both/and, mixed-use set of real-time and electronic rhetorical situations; of individual representation and communal knowledge-making; and of domestic and public cultures.

In this chapter, then, I'll first address three models of electronic portfolios, demonstrating the specific curricular ecology informing each. The argument here is not evaluative, but descriptive: It's not that one model of electronic portfolio is inherently "better" than another, but rather that each privileges certain assumptions about learning and thus fosters certain kinds of engagements. These engagements are located in processes and practices; in structures; and in habituated behaviors, especially those that contribute to sustainability. Another way to think about such behaviors is through the lens of the everyday, and I'll conclude by rewinding to a literacy artifact of the past—the sampler—and consider how the *everyday-ness* of samplers has contributed to their continuing relevance and to what that might tell us about the potential everyday-ness of electronic portfolios as another kind of sustainable literacy artifact.

And one final note before beginning: the focus here is largely (although not exclusively) on electronic portfolios in rhetoric and composition contexts. As the literature on electronic portfolios demonstrates, however, considerable work in eportfolios is occurring in other curricular and co-curricular contexts. (See, for example, both the Web site for the Inter/National Coalition for Electronic Portfolio Research [http://ncepr.org/], and the Coalition volume of research, *Electronic Portfolios 2.0: Emergent Research on Implementation and Impact*, Cambridge, Cambridge, & Yancey, 2008).

Social technologies succeed when they fit into the social lives and practices of those who engage with the technology.
(Boyd, 2006)

THE CURRICULAR ECOLOGY OF ELECTRONIC PORTFOLIOS-*QUA*-PROCESSES

For many, the first model of electronic portfolios was one that morphed from a print model. As has been well-documented, writing portfolios allow composers to document processes as well as products and, through a reflective text, to comment on any number of related topics (e.g., their development as writers, an analysis of the processes contributing to final texts, an assessment of portfolio texts). In general, such portfolios have been principally if not completely verbal, assembled into book-like texts (Yancey, 2004b), which, as Michael Allen, Jane Frick, Jeff Sommers, and I (1997) pointed out, is not necessarily the way the portfolios are *read*. In other words, although students may have used various visual strategies in their composing—from doodling on a draft to graphing an exercise in invention to using digital notes to mark part of text to be reconsidered—the portfolio itself did not highlight such visuals. In part, such dearth wasn't so much the result of prejudice against the visual in favor of the verbal, but rather the result of portfolios that emerged from but didn't necessarily include full processes of invention, multiple drafting, peer reviewing, reflecting, and other practices associated with composition in the late 20th and early 21st century (for a discussion of the late 20th, see Lindemann, 2002; for the 21st, see Fulkerson, 2005; for an overview of both, see Yancey, 2006a).

What was immediately apparent in the morphing from print to digital was that even the screen of the now-ancient-seeming word-processing machine is more visual than the pages on which texts are printed.[1] This observation and experience led to the use of the visual as a means of making meaning such that the portfolio became, almost without intention, an exercise in the visual and the verbal combined. Moreover, because students were using common tools—from Microsoft Word to PowerPoint to Web-composing software—they were creating *their own* structures and artifacts. Two such practices, and their artifacts, exemplify the new exhibits associated with this first model of eportfolio.

The first is the use of the visual, quite literally, to highlight drafts in one of several ways. Sometimes, for example, differences among drafts are highlighted. Despite the fact that composing inside word-processing software makes plain the anachronism involved in thinking of "drafts" as discrete entities, as Pam Takayoshi (1996) noted, there are still iterations of a draft, and the visual can help writer and reader see what is different from one textual iteration to the next. Other times, areas within a text might be highlighted, with the writer providing annotations as to the rationale for rhetorical choices. In other words, inside a digital portfolio, writers use the visual and the verbal together to show development, rhetorical sophistication, and reflection. For example, first-year Clemson student Josh Reynolds, in arguing that some college athletes are heroes, highlighted a specific part of his essay,

> It is rare, but not impossible to find an athlete like the quarterback for N.C. State, who is only a junior, but is married, has a daughter, and is the leader of his team, an outstanding athlete, and whose grades aren't too shabby either. This is someone to look up to. Or consider Willie Simmons, Clemson's quarterback, who recently volunteered his time to raise money to fight a deadly disease plaguing young people.

[1] Cathy Burnett and Julia Myers (2006) documented changes in composing processes when students, in their study of elementary students, write *to* the screen itself. As they are documented, these processes are very different than the processes children engage in print (see Yancey, 2004a). Likewise, the *New York Times* (Donadio, 2007) highlighted the role that software plays in helping writers keep track of multiple narratives.

and in the margin, explained why:

> *I used these examples because, when I first heard the stories, I was impressed and inspired. These are not the kind of people talked about in our [readings]. I felt cheated to be given one side of the story, and my readers deserved a more balanced view.*

Here, Josh explains the why of specific examples he highlighted, directly linking them to the logic of creating a "more balanced" argument.

A second innovation in early models of electronic portfolios was the use of mapping as a means of representing composing processes. Sometimes, the maps were used to show before and after representations of composing to illustrate change—especially elaboration and the inclusion of the social—in processes; sometimes, maps were used initially as a tool for analysis (so that the ways students compose were made visible and then enhanced); and sometimes, they were used simply as a means of documenting process (see Figure 1). These maps spun off other mapping activities, like the mapping of different discourse communities that students participate in (Peagler & Yancey, 2005), so that students could see different communities and could consider how their behavior changes from one to the next. Put differently, students saw through their own mapping that they are already very adept as communicators. More generally, in making abstractions visible through mapping, students and faculty found the abstractions more specific and easier to address.

Figure 1: A writing process map

Taken together, these innovations define the first model of the digital portfolio, one that assumes a learning ecology with process and the individual at the center. With that focus, it replicates composition's early emphasis on process (Lindemann, 2002), but relies on the affordances of the electronic for new ways of showcasing process. And although electronic portfolios can be available for worldwide audiences to read, the attention of this model, as has been the case with writing portfolios generally, is on the opportunity portfolios create for the representation of learning *inside* the classroom. In that sense, this ecology is a closed system. At the same time, the innovations introduced through this model—highlighted text and maps and reflective annotations—could as easily be accomplished in print; that is, they are not medium-specific practices. The ecological system is thus open, interacting with and informing other ecologies where other values and media operate.

THE CURRICULAR ECOLOGY OF ELECTRONIC PORTFOLIOS-*QUA*-STRUCTURE

A second model of electronic portfolio provides a structure intended to assist students in one of two ways: by creating a framework that students can work within, or by articulating assumptions and frameworks that, in print, have been unarticulated. In each case, the structure brings together outcomes for students and the resources students can tap in order to meet those outcomes.

The general education electronic portfolio at Indiana University–Purdue University Indianapolis (IUPUI), for example, invites students to think of their learning not in the familiar terms of courses or even in terms of experiences outside courses, but rather in terms of *outcomes* satisfied by learning both in school and out of it. In the portfolio itself, students find a matrix that builds in developmental learning as well as experiential learning keyed to the six outcomes for IUPUI's principles of undergraduate liberal studies: Core Communication and Quantitative Skills; Critical Thinking; Integration and Application of Knowledge; Intellectual Depth, Breadth, and Appropriateness; Understanding Society and Culture; and Values and Ethics. Thus, when a student chooses to include an artifact in his or her portfolio, he or she engages in a process including two steps: (1) identifying where in the matrix (see Figure 2) it belongs, and (2) commenting on that inclusion in a reflective text. Moreover, once a file has been loaded, faculty can read and respond to it; thus a sense of community is built into the eportfolio system. This general education "matrix thinking" (Hamilton & Kahn, 2004) can set up a second iteration of matrix thinking as well. When a student later includes pieces of work in a discipline-based eportfolio, she or he engages in a "doubled" matrix thinking, or what we might call *multiple mapping*: thinking through and with the general education matrix as well as through and with the disciplinary matrix. Such mapping—the ability to see a given artifact in the several different contexts provided by the matrix—is one hallmark of intellectual development.

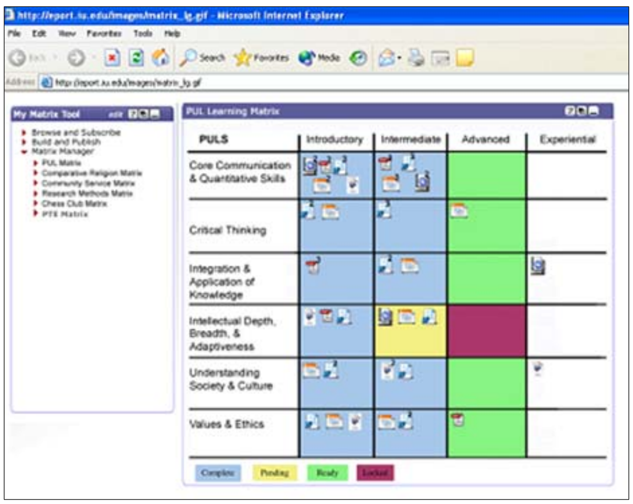

Figure 2. IUPUI portfolio matrix.

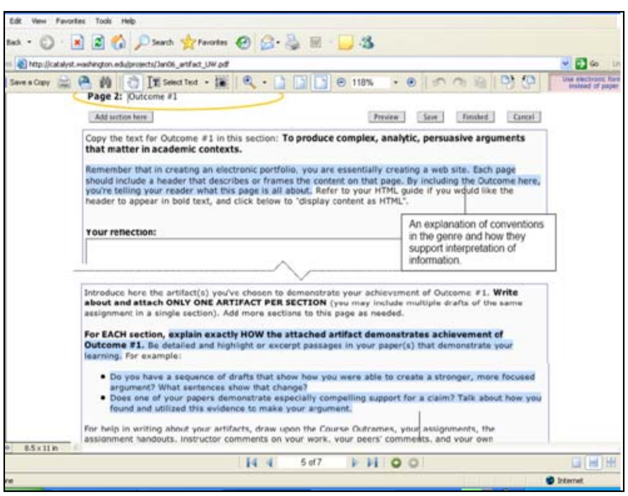

Figure 3. Catalyst portfolio system interface.

A second eportfolio with structure as a central feature has been developed in the composition program at the University of Washington. There, six graduate students experienced in print portfolio development collaborated with information technology staff to craft an electronic portfolio for use in writing classes. As is often the case, these teachers were morphing portfolios from one medium (print) to another (digital), but in this situation, the teachers were using Catalyst, a home-grown software that includes a portfolio tool (see Figure 3). Working together but coming from different disciplines, the participants in the collaboration spent considerable time explaining assumptions and practices to each other to customize the tool for use in writing classes. One of the key decisions the team made was to articulate, in an explicit way, much that was invisible in the print model. For example, as students work on an outcome, they are reminded about that outcome, about ways to demonstrate it, and about the eportfolio-as-genre itself and expectations accompanying portfolios. In other words, the portfolio itself functions directly as a teaching tool, with the portfolio environment including, by design, reminders about the curriculum as well as a scaffold to support portfolio completion. In the print portfolio model, at UW as elsewhere, such information is usually shared with students verbally, but not in a systematic or consistent way, nor, typically, has such information explicitly framed the process of portfolio-making. But the collaborative design process at the University of Washington persuaded the participants that building this scaffolding into the model, where it became a part of the environment, would support students in new ways and sustain their work over months, semesters, and years (Lane & Fournier, 2006).

Generally, then, the ecological system assumed in the model of eportfolio attuned to structure is oriented to curricular outcomes—to the inclusion of learning across courses and experiences—and to explicit instruction in the genre of the electronic portfolio. In its inclusion of various types and artifacts of learning, it seems an open ecology, and its structure supports insights generated both within a single course and across several courses and experiences. At the same time, given a focus on institutional outcomes rather than student-generated outcomes, the ecology tends toward closure.

THE CURRICULAR ECOLOGY OF ITERACTIVE, EVERYDAY ELECTRONIC PORTFOLIOS

A third electronic portfolio model is defined by two features: (1) the opportunity to work at the *intersection* of the personal and the public; and (2) the conceptualization of portfolio-making not as a one-time opportunity, nor revision as one-time occurrence, but as a *reiterative process*. Three versions at three very different schools exemplify this model.

The first version has been developed at LaGuardia Community College, where over 50% of the students are immigrants, 70% of them are women, and nearly all of them are first-generation college students. Funded by a Title V grant (for Hispanic-serving institutions), LaGuardia developed a 5-year eportfolio plan, hoping that each student would create an eportfolio. Given the different kinds of programs offered—from vocational programs to associates degrees to transfer programs—the eportfolio project leaders looked for ways that the eportfolio might connect to all students. In designing their model, they turned to the strengths of the students and thematized the model as an exercise in two cultures: home culture and school culture. The two-culture approach accomplished two aims: (1) it provided a space that linked the personal and public; and (2) it provided a doubled frame or lens through which students could see their development and achievement. Thus, for instance, one student, born

> in Korea and educated there as a medical professional, Kyoung changed careers when she came to New York. At LaGuardia, she used her ePort-folio to integrate her artistic talent with her interest in art as a tool for healing. Her ePort-folio, which she has presented and released for public discussion, includes papers based on research in the Museum of Modern Art, essays on art history, discussions of Korean language and her family history in Korea, and a thoughtful reflection on art therapy careers. Her ePort-folio also displays her own original artwork, giving depth and visual power to her story. (Clark, online)

The LaGuardia faculty also conducted research into the ways that eportfolios fostered student learning; this research was conducted both as an institutional project and as team participation in the International Coalition on Electronic Portfolio Research. One goal of the Coalition is to understand more about reflection inside of electronic portfolios and the ways reflection can assist student learning. One mechanism Coalition members have used to take up this inquiry is “a review of a reflective artifact” (Yancey, 2006b). In their review, LaGuardia focused on the electronic portfolio of a single student, whose eportfolio over time became three eportfolios. In other words, what the LaGuardia faculty found themselves inquiring into wasn’t a single portfolio, or a portfolio under revision, but a rather set of portfolios developed in a reiterative process. Their analysis began with Kyoung’s first portfolio:

> In the first iteration, Kyoung seems to be mostly interested in developing an electronic portfolio that speaks of herself as an individual. She utilizes one of

> the templates available to her, but she customizes it in such a way that it becomes a reflection of self-expression. (Doyle, 2005, p. 2)

A second eportfolio iteration shows Kyoung adapting the portfolio and its contents to show what she does well and to think about her future. Its intent seems dual: to document and to explore.

> In the second iteration, Kyoung has become more comfortable with the form of the electronic portfolio and begins enriching its content. She edits most of her previously posted work by revising the text of an essay, adding an image, and/or reorganizing how she presents her work on a page. Also interesting is what Kyoung chooses to add and to delete from her electronic portfolio in this iteration. For instance, in her revised essay concerning her educational goals, she has narrowed down her career choice and is now thinking about her abilities, strengths as a student, personal likes and dislikes, reasons for her selection of a career path, and is making connections with her past experience. Moreover, she has begun to consider courses that will enhance her knowledge and that might benefit her future employment opportunities and impact on salary possibilities. (Doyle, p. 2)

The revolution, if there is one, is the social one of interconnectivity.

(Porter, 2003)

In the third iteration, according to the LaGuardia researchers, "It is no accident that. . . Kyoung turns metaphorically and reflectively to face the world" (Doyle, p. 2). In a move characteristic of other changes in her eportfolio, Kyoung changes the opening portfolio page dramatically:

> The page is deep blue; to the left is a repeating sequence of five images of Kyoung, all but one of them close-up head shots. In the center, her name is spelled out in large capitals. To the right, in marked contrast to the five "portraits" is Ingres' image, Odalisque, a la Fauve and flat as a sand painting, which Kyoung has appropriated from her earlier essay. "Who am I," Kyoung seems to be asking the reader, "the plucky young woman of the flickering portraits, or the sensual icon?" (Doyle, p. 2)

In moving from one eportfolio to the next, then, Kyoung shifts from a focus on self to a focus on self-as-student to a focus on self-in-presentation to a public audience, and in these shifts, she displays increasing intellectual maturity and rhetorical sophistication. And the role of the model itself matters: it is located in a curricular ecology assuming reiteration of self and portfolio, through the use of both new and appropriated materials. Perhaps as important, what the LaGuardia faculty also learned was that students wanted to show these eportfolios to others—colleagues on campus and families around the world. What began as an academic exercise had become something more.

In a completely different context, Josh Reynolds, an engineering student at Clemson, also has re-iteration at the heart of his eportfolio. And he, too, has three electronic portfolios. The first was one created for a speech class and includes four texts: the written texts of two talks in addition to a Microsoft PowerPoint slideshow that accompanied one, and a video of Josh making the other presentation. Like many electronic portfolios, it seems intended to show that his work for the class is satisfactory, but it includes no process work and no reflection. Accordingly, while the portfolio is multimedia, its curricular ecology is product-based.

Josh's second portfolio also documents work for a course, but the electronic portfolio itself participates in its own self-designed ecology, as the buttons on the left side indicate: Home, About Me, My Photos, Storyboards, Speech Class, and Contact Me (see Figure 4). The writing class eportfolio has taken on an identity of its own, and it includes several assignments as well as a writing process map. In talking about the portfolio process, Josh identified this portfolio as the one that helped him understand what a portfolio could be:

> freshman english is really where all of this portfolio business started. it was the first portfolio i had ever attempted, and it turned out pretty well.... i learned that reflection is a key element in portfolio design. it's important to make connections across subjects and relate course material to the real world.

Josh's third iteration was developed inside a course as well, but this time inside an independent study that offered Josh the opportunity to craft his own design. He reviewed many electronic portfolios, compiled an inventory of exhibits he might include, worked with images and visual design, and decided on two key design elements: (1) a dual focus on inside school and outside of school; and (2) the use of a synthesizer and its component parts—which represents both the synthesizing function of the portfolio as well as Josh's interest in music—as a unifying visual (see Figure 5). In this reiteration, Josh carried forward his earlier English portfolio in two ways. First, he provided a link to it so that viewers interested in seeing the earlier model could do so. Second, he chose exhibits from the earlier model and included them inside this one. And in talking about the electronic portfolio later, he noted:

Figure 4. Josh's second portfolio.

> The whole point of the portfolio that I made was to help me realize the connections that I made across the curriculum, and to make these connections obvious to the people who view my portfolio, to show that I indeed did learn something, and not just how to regurgitate the assignments of the past semester. (qtd. in Weaver, 2005)

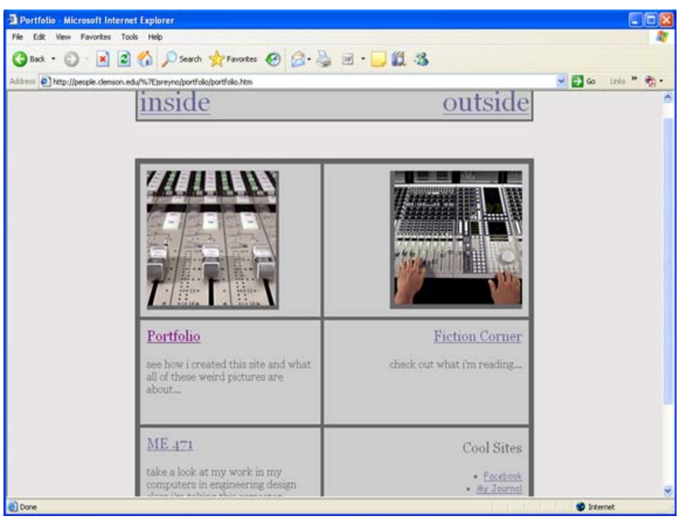

Figure 5. Josh's third portfolio.

Taken together, Josh's reiterations help us understand three aspects of eportfolios.

First, as eportfolios are reiterated, their contents tend to expand in number and in file type. Thus, we see the first iteration's products of a class; the second iteration's inclusion of products, processes, and reflection; and the third iteration's very diverse set of exhibits, including verbal texts; images and photographs; a writing process map; internal and external links, for both academic and social purposes; schematics with discussion; assignments; a review of other portfolios; his resume; publications; and texts read for pleasure.

Second, as was the case with Kyoung, Josh's portfolio moves ever outward, in his case from a focus on meeting the goals of a class to meeting his own goals as learner, student, writer, thinking, musician, etc. And like Kyoung, whose learning is dually framed, Josh's learning is as well, through the dual frame he creates with outside school and inside school.[2] Third, Josh's own sense of curricular ecology changes: In his third eportfolio, he understands learning as occurring in multiple sites, and he sees *connections* as the key to learning.

[2] As Judith and Geoffrey Summerfield (1986) observed two decades ago, working an idea in contrast is a useful exercise in invention.

The third electronic portfolio that helps us understand a reiterative eportfolio process was created by Clarissa Owens, a junior English major at Florida State University who enrolled in a one-credit studio portfolio course. Clarissa brought several advantages to the task of eportfolio-making: she had already completed one portfolio, so she had engaged in the processes of creating an eportfolio; she had a strong sense about her own identity; and she saw other Web sites as a resource for her own re-design. In completing a first reflective text, she remarked:

> I feel like much of my identity is connected to what I do that isn't necessarily required. What website do I use most often? What websites do I enjoy the most? [Posing questions like these]. . . might give us an opportunity to explore the website design we like to use the most or what we are most comfortable with.

In fact, Clarissa created two possible portals; shared her eportfolio (as did other members of the class) in a showcase event; carried forward into the new portfolio several texts from the initial portfolio as well as links to the first portfolio; and provided for the future of the portfolio in two ways: (1) by linking to a blog where she maintained a journal of her activity during a summer abroad experience (see Figure 6); and (2) by creating a space that she can grow and develop later. As she says on her eportfolio:

> My plans to study abroad in Florence in Summer 2007 inspired me to create an online travel journal. My journal will include first person narrative, short stories, and of course, photography. . . Painting and Photography are two areas that give me the greatest sense of relaxation and freedom. The challenge of expressing myself without words is an excellent contrast to the English academic setting. The ability to explore and outpour myself through the arts has provided me with much insight into the complexity of human communication and connection. I am currently showcasing a small portion of my photography. The Travel Writing section of my portfolio will also include photography from my study in Florence. The painting portion of my portfolio will be updated at the end of Summer 2007.

Here then, we see the eportfolio process as particularly dynamic. It includes reiteration from an earlier model, a link to a blog that functions as an extension of the eportfolio, and provision for future exhibits with an explanation of what they may include. Not least, it has morphed from an initial beginning as a school exercise to a place to "explore and outpour."

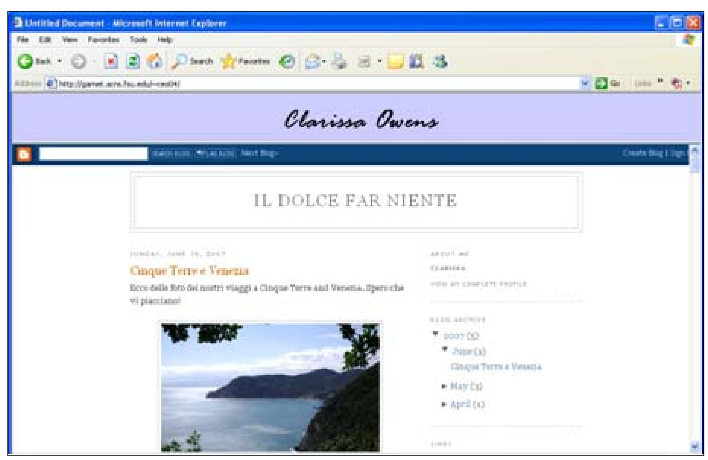

Figure 6. Clarissa's portfolio.

Each of these eportfolios—composed by Kyoung, Josh, and Clarissa—assume a curricular ecology that is site-flexible, site-multiple, and site-mobile, occurring in many places, with school serving as one site only, and that assumes the student is the principal agent of his or her own learning, that understands learning as a social phenomenon, and that enacts learning as an ongoing process.

SUSTAINABILITY, EVERYDAYNESS, AND SELF-SPONSORSHIP: SAMPLERS AS EXEMPLAR AND PROTOTYPE

Overall, these three models of electronic portfolio—the classroom-located, process-based model; the structured learning model; and the reiterative model—co-exist. It is possible for them to interact, such that, for example, the classroom-located model contributes to the reiterative model.[3] Each model, however, assumes a different curricular ecology, and each model understands sustainability—in terms of learning—quite differently. In the first model, where process is central, the hope is that the portfolio itself is superfluous, that the processes engaged in by the students, both in composition-making and in portfolio-making, are internalized and made sustainable. In the second model, the aim is likewise to inform students such that the portfolio is merely a vehicle, its path to the goal a structure that literally links individual student with texts and responses and institutional outcomes. The third model intends a different goal: it aims to foster learners who see portfolio-making, and work in related genres like blogs, as an ongoing *way of being* that continues beyond school day, semester, year, and graduation. Thus, in this model, both the artifacts and the processes aim to be sustainable. To accomplish its aim, this model specifically builds in two features: (1) links between a student's personal life and intellectual life (even more than the academic life), and (2) a notion of reiterative processing.

In these learning ecologies, is sustainability possible? In raising this question, the editors of this collection probably mean sustainability in terms of the human and technological resources needed to keep such efforts alive. But another angle on sustainability focuses on learning and how *it* is sustained, and on how an electronic portfolio contributes to that outcome. Just as faculty offices and hallways are littered with print portfolios that students never retrieved, so too do students send electronic portfolios to instructor offices and the digital trash can simultaneously. At the same time, one of the current buzzwords in the world of electronic portfolios is "life-wide," which speaks to a new ambition for eportfolios generally—to engage students now *and* in the future to facilitate ongoing personal and intellectual engagement. Examples of the move in this direction, as Clarissa shows us, are evident, but the challenge is how to accomplish this life-wide goal on a large scale, with many students, and with many types of students. Is it possible to invite students to create electronic portfolios that they would willingly continue working on once due dates and deadlines have passed? Put differently and borrowing from Deborah Brandt (1998), how might an electronic portfolio become a sustained site of *self*-sponsored writing and learning?

To think about this question, I want to return to an artifact of learning and literacy that in the context of a discussion on electronic portfolios will seem both out of time and out of place: samplers that women made for centuries prior to their admission to schools of any kind and that they continue to make today.[4] We actually know very little about samplers, and much of what we do know is contradictory, in part because as practice and text, samplers are dynamic, changing over time to suit varying purposes and audiences. Initially, as Maureen Goggin (2004) suggested, samplers provided a text for invention, each one involving many different kinds of stitches; at another moment, they provided a site of learning where children were

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[3] Josh was asked by Clemson to attempt to re-create his third eportfolio inside Blackboard; this reiteration, as he says, was not satisfactory: "Reynolds reported that the ease of the Blackboard portfolio template has the potential to make the process more like filling in the blanks of a form with a bare minimum of effort and less impressive results" (Weaver, 2005).

[4] As Maureen Goggin (2004) suggested, not all sampler-makers are women, but because what we know about samplers as practice and text derives largely from those of women, I am using the female pronoun throughout.

schooled as they practiced their alphabets, numbers, and even geographies; at still another time, they provided an artistic artifact first hung on the wall and then bequeathed from mother to daughter.[5]

Today, of course, they serve new purposes—a hobby for some, an art form for others, a way of thinking for still others. In my home, one sampler commemorating the birth of my daughter hangs in her bedroom, one I stitched is in the family room, and a framed print facsimile of an 18th century sampler is in my living room. Moreover, I have used a photographic image of the sampler in my family room in several slideshow presentations—to remind us of our past and to demonstrate the material quality of literacy (see Figure 7). In addition, this sampler, its image, and my digital capturing of it has provided material for me to think with and about literacy, about the materials we use in compositions of many kinds, about the visual and the verbal working together, and about how—in re-working an artifact of the past—I engage in a collective reiterative process.

For 600 years at least, samplers have survived, while other textual practices—like manuscript-making—have not. Why have samplers survived, and what might such survival teach us about the viability, the sustainability, of any site of self-sponsored learning, be it fabric and thread or screen and the digital?[6] The history of samplers, in this regard, teaches us four lessons (at least):

1. In the language of the digital, samplers provide a *flexible platform for literacy*. Initially, they provided a site for invention; today they provide an opportunity for creativity and community. The idea that meaning can be created through a material practice of embroidery has continued, while the “platform” fabric has changed over time, as have the kinds of stitches employed. As a platform, samplers have been adapted to different ends as needs warranted without losing their identification as samplers.

2. Initially, as sites of invention, samplers were not formatted or templated except through the size of the fabric worked, which, like any genre, was conventionalized. Later, when sampler patterns were printed and more widely available, templates became a beginning point for many sampler-makers. Even when used, however, the expectation was that they would be only the starting point; the creator still needed to personalize the template by means of color and design. From a Bakhtinian perspective, through material practices including the use of templates, the sampler composer made the sampler her own and put her sampler in dialogue with the de facto community of samplers.

Figure 7: An example sampler

3. Samplers are understood to be *reiterative*. As a cultural practice, they are reiterative in the sense that, at different times, they have literally taken different shapes and played different cultural roles. Samplers are reiterative on an individual level as well, with sampler-makers replacing earlier stitches with new ones to create a different effect, adding borders, placing

[5] Goggin (2004) has provided a more detailed historical review and analysis.
[6] Many might argue with the comparison here, especially given the differences in medium. As I explain later, medium is important (as is technology), but the principles of literacy seem to cross both.

samplers inside frames, re-winding to re-think and begin anew. Samplers come in a context, with an expectation that change is a convention defining the genre and the text.

4. Samplers are a *composition*, a unified text speaking to a personal and cultural expression of the sampler-makers. In that sense, in providing a text for composition and like all literacy practices, the sampler plays an identity-making role.

What does all this mean for electronic portfolios and their sustainability in terms of learning? First, students need to set their own outcomes. In general, a system that is keyed to outcomes can be very helpful in terms of assisting student learning; research shows that asking students to evaluate their learning in the language of outcomes is one of the two most important tasks we can set (Murphy & Yancey, 2007). At the same time, once those outcomes are met, the task is concluded, suggesting that assisting students in setting their own outcomes—outcomes that span the personal and the institutional and that take them beyond the latter—is critical.

Second, asking students to create but one portfolio doesn't provide them with enough experience in portfolio-making, which is itself a reiterative process, as is learning itself. Like learning, portfolio-making in this sense is never done, but rather always in process. Showcasing the ways students have engaged in reiterative processes and the results of such reiteration is a task that institutions should undertake.

Third, inviting students to situate their eportfolios in larger contexts—be those in portfolio gallery events on campus or to their own blogs—brings a new salience to the portfolio, making it a public exercise as well as a personal one.

Fourth and not least, we don't know enough about how identity is shaped by means of electronic portfolios; this is a task we might try ourselves and we might take up with students. Fifth, instead of seeing portfolio-making as a culminating activity, we might see it as beginning activity; we might create portfolios in diverse media, including print; and we might celebrate (and learn from) those that demonstrate the ongoing.

A SCENE

In 1991, a friend and I are in Indianapolis for a meeting on print portfolios and ways to integrate them into K–12 settings and curricula. A leader in writing portfolios, my friend looks to me, saying, "I think portfolios have crested. I wonder what will come next." At the time, neither of us could imagine *electronic* portfolios, although it was a mere 3 years later that NCTE hosted an electronic portfolio conference in Indianapolis.

Upon reflection, I'd note that at least some of what I've claimed here for digital portfolios is true for print. All models of portfolio assume a curricular ecology, for example. All portfolios can be showcased in public, and, at some places, students do showcase print portfolios, while elsewhere students showcase eportfolios. All portfolios could invite students to document their learning in a context of outcomes, and again, in some places, students do so in print.

But beyond the integration of word and image (and now sound and video); beyond the marriage of multiple media; beyond the linking that connects doubly, both electronically and cognitively; beyond all the affordances of the eportfolio are others that distinguish it in terms of the everyday: its continuation as a reiterative process, its ability to circulate, especially as it links to other genres both print and electronic; and its provision of a site to return home to and of a site of self-sponsorship. These *are* new. What this means long-term, how we make sense of it, and how it will influence our own views of literacy and learning are questions for a tomorrow beginning today.

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Introduction to Section II
"Sustaining Writing Programs"

INTRODUCTION

In his Philosophy of Writing Program Administration, Bill Wolff argued that "a writing program's primary goal is to develop critical writers, thinkers, researchers—and, now, more often than not, critical users of technology."

Ken McAllister and Cindy Selfe, in a chapter in *The WPA Resource*, persuasively described the ways in which WPAs can help program stakeholders to examine programmatic and pedagogical goals as they make decisions about technology.

They posed fine-grained questions, like:

1) What is the saturation level of computers and computer support in a community?
2) Is access to computers genuine or theoretical for teachers and students?
3) Is existing computer equipment sufficient and appropriate for the particular activities of composing and communicating?
4) Is existing equipment adequate to meet the other curricular needs of the writing program?

And they also suggest a set of ways in which technology integration can be fostered within a program, like:

- providing release time to instructors in exchange for hosting workshops on computer-based instruction
- accessing campus resources, including workshops, facilities, and support for the writing program
- hiring an instructional computing specialist
- providing funds for off-site technology workshops and training

THE COMPLEXITIES OF WPA WORK

As most of us know—and as the work of Wolff, McAllister, and Selfe well-describes—the work of a writing program administrator is complex. Hiring, staffing, and scheduling—20 courses a semester, for some of us, and 200 courses for others; coordinating within and beyond our units, departments, and colleges; providing professional development for our faculty; developing curriculum; assessing and evaluating the work of our students and our faculty; budgeting; report writing; developing web content; producing publicity materials; grand visioning; logistics juggling; and much, much, much more are our daily tasks.

Sustaining digital work in a writing program is no longer an “added-on” activity; it is crucial to any technological ecology and every writing program, and impacts each of the tasks in that long list.

The work of WPAs maybe hasn’t expanded, but it has spread with digital tools. We think about social networking tools as spaces for professional development, networking, and connecting building. We navigate instructional technology systems and staff at our institutions to ensure our technological needs are met. We work with faculty and graduate students to address their technology needs—which can span from access to a laptop to large-scale professional development efforts.

SECTION OVERVIEW

In this section, “Sustaining Writing Programs,” authors speak from writing program administrator, faculty, researcher, and programmatic perspectives on the fostering, developing, and sustaining of technoecologies.

Michael Day offers a view of the complexities of sustaining digitally integrated first-year composition programs and the role that a writing program administrator has in that process.

Patty Ericsson proposes a framework for analysis and action, anchored by her experiences developing a new, interdisciplinary degree program in digital technology and culture.

Beth Brunk-Chavez and Shawn Miller imagine new institutional structures and the support components that might help encourage the adoption of their Hybrid Academy professional technological development model across departments at—and in spaces beyond—their institution.

Writing from a community college context, Kip Strasma borrows from an environmental assessment tool and shows us how that tool can be used to guide the development and sustainability of first-year technoliteracy programs.

Finally, Jude Edminster, Andrew Mara, and Kris Blair address the enormous pressure graduate students and faculty committed to new tools and technologies are putting on their institutions, especially where electronic thesis and dissertation projects are concerned.

These authors provide a set of scenarios, tools, and frameworks nimble enough to span different institutional contexts and types of WPA work. There is considerable and impressive work available on writing program administration. We hope this section offers what doesn’t currently exist in our scholarly landscape—a specific focus on the ways in which WPAs can negotiate and foster healthy technoecologies.

CHAPTER	6
TITLE	The Administrator as Technorhetorician: Sustainable Technological Ecologies in Writing Programs
AUTHOR	Michael Day
OVERVIEW	This chapter considers the role of the technologically knowledgeable administrator as a decision-maker at the intersection of complex systems of relationships among stakeholders in a university setting. These systems include the technological infrastructure and the faculty development support system, and issues such as governance, assessment, and pedagogy. I argue that technorhetorician administrators need to be able to draw upon existing knowledge and experience in at least three ways. First, technorhetorician administrators should be reading the scholarly work of peers, not only in rhetoric and composition, but in computers and writing studies. Second, technorhetorician administrators should be involved in and help maintain the national and international conversations about rhetoric, technology, and composition. Third, technorhetorician administrators must learn the history, relationships, and concerns of stakeholders in the local university context. Practically speaking, technorhetorician administrators must be able to listen to and act upon theoretical and anecdotal knowledge at both the local and global levels. Drawing upon examples and case studies, I discuss the evolution of an administrative philosophy that fosters the development of sustainable uses of technology in writing programs, including guiding principles for program administrators interested in such questions as: • Who are, and how do I learn about, the stakeholders in the intersecting technological ecologies within and outside the university? • On what information do I base my decisions about using technology in the program? To whom do I listen, when, and how? • How do I decide between national recommendations and local exigencies when they conflict?
TAGS	academic program, assessment, bottom-up, Colorado State University, community of practice, consensus, CSU, early adopter*, ecology, global, infrastructure, living database, local, Michael Day, stakeholder*, sustain*, technolog*, technorhetorician, top-down, WPA, writing program administrator
AUTHOR BIOGRAPHIES	Michael Day is an associate professor of English at Northern Illinois University, where he teaches rhetoric, composition, technical writing, and writing for electronic media. Co-founder of the Great Plains Alliance for Computers and Writing and host of the 1999 Computers and Writing Conference, he has presented and published on topics ranging from intercultural rhetoric to Internet communication and online teaching. With Susanmarie Harrington and Rebecca Rickly, he is co-editor of *The Online Writing Classroom* (Hampton Press, 2000), and with Carol Lipson he is co-editor of *Technical Communication and the World Wide Web* (Lawrence Erlbaum Associates, 2005). Day directed the First-Year Composition Program at NIU from 2002 to 2008, and is a past chair of both the Conference on College Composition and Communication (CCCC) Committee on Computers in Composition and Communication and the National Council of Teachers of English Assembly on Computers in English. In 2006, Day was awarded the Charles Moran Award for Distinguished Contributions to the Field by Computers and Composition. In 2007, Day was elected to the CCCC Executive Committee. Day's site is available at http://www.mday.org

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The Administrator as Technorhetorician: Sustainable Technological Ecologies in Writing Programs

Michael Day

In this chapter, I consider the role of the technologically knowledgeable administrator as a decision-maker at the intersection of complex systems of relationships among stakeholders in a university setting. These complex systems include the technological infrastructure, such as machines, software, networks, and lab spaces; the faculty-development support system, including program-specific and university-wide efforts; governance issues such as planning, policy, procedure development, and administrative decision-making; assessment issues such as electronic portfolio scoring, placement, and programmatic feedback; and pedagogical issues, such as computer classroom concerns and the relationship between online and offline activities.

As Shirley Rose and Irwin Weiser reminded us in *The Writing Program Administrator as Researcher* (1999) and *The Writing Program Administrator as Theorist* (2002), research, theory, and everyday decision-making must be integrated at every level of the complicated work of directing a writing program. Thus, in negotiating a sustainable pathway for a program that will meet the needs of as many stakeholders in the intersecting ecologies of a university, the administrator needs to be able to draw upon existing knowledge and experience in at least three ways. First, to whatever extent they can, technorhetorician administrators should be reading the scholarly work of peers, not only in rhetoric and composition, but in computers and writing studies. Second, technorhetorician administrators should be involved in and help maintain the national and international conversations about rhetoric, technology, and composition, through online discussions and face-to-face conferences. Third, technorhetorician administrators must learn the history, relationships, and concerns of the stakeholders in the local university context. Practically speaking, technorhetorician administrators must be able to listen to and act upon theoretical and anecdotal knowledge at both local and global levels.

Using my experiences as technorhetorician for over 17 years, university faculty development chair for 5 years, and writing program administrator (WPA) for 6 years, in this chapter I discuss the evolution of an administrative philosophy that fosters the development of sustainable uses of technology in writing programs. Through examples and case studies, I provide some guiding principles for program administrators interested in answering the following questions:

- Who are the stakeholders in the intersecting technological ecologies within and outside the university? How do I learn about these stakeholders, and how do I gauge the impact of my decisions upon them?
- On what information do I base my decisions about using technology in the program? To whom do I listen, when, and how?
- How do I decide between national recommendations and local exigencies when they conflict?
- How do I ensure that everyone teaching in the program has access to hardware, software, and network services essential to those who use computer technologies in the classroom?

- How do I plan and implement faculty development (including professional development for graduate students) in a technology-integrated program?
- How do I plan and implement an assessment program using best practices in rhetoric, technology, and composition?
- How do I document, report on, and publicize my program's achievements in technology, assessment, and student writing?
- How do I ensure that our uses of technology are focused on meeting the needs of students, not the needs of educational, software, hardware, and publishing companies?

Ultimately, I do not make a case for detailed and specific approaches to sustainable technological ecologies in an academic program, but instead I illustrate and recommend a process of listening to global conversations about technorhetoric, processing and adapting technorhetorical theories and suggestions to local circumstances, then acting with the best interests of key stakeholders in mind.

WHY TECHNOLOGY MATTERS TO WRITING PROGRAMS

In response to external forces as well as internal needs, programs and departments at every level of higher education are under pressure to incorporate computer and networked technologies into the curriculum. From outside the institution, big business in the form of computer companies and course-management system vendors, network providers, and trade and textbook publishers vie for the attention of educators who have a say in adopting technology. Government sources at the local, state, and national levels are also pushing for technology adoption through new standards (e.g., the National Educational Technology Standards), mandates, and grant competitions. Parents and community members—often having heard about the wonders of technology in education through media and advertising hype—have come to expect minimum levels of computer and Internet integration in education. Inside educational institutions, many administrators, themselves susceptible to the hype, clamor for new and better technological innovations, despite the associated costs and the burden posed to faculty. Most teachers, having used computers and the Internet for many years, will say that they want to use technology in their classrooms, but often have difficulty finding the time to learn to use it effectively. Many students in the United States, having grown up communicating, socializing, and playing on computers, consider access to digital technology a requirement in educational environments, especially in higher education settings.

On the other hand, both external and internal forces work against effective technology integration. Externally, public school budgets have to come from appropriations and taxes, and public schools and colleges are getting less and less funding from states and municipalities. In many areas, the sad truth is that public universities are moving from "state-supported" to "state-assisted" as the percentage of overall budget provided by states has waned in recent years (see also Porter, this volume). Thus, funding for equipment is often scarce, as is support for faculty development activities in the area of technology. Internally, beyond budget constraints, one of the biggest factors working against technology adoption is the lack of time—teachers are overworked and simply too busy to learn to use new tools. And, although faculty at colleges and universities are usually not as constrained by laws, use policies, and network-blocking programs as teachers at secondary schools, they do encounter policy-based roadblocks to using computers and the Internet with their classes. Finally, at some schools, a combination of technophobia and mid-to-late career stagnation has led some faculty to resist technology and even label it as a threat to a humanities-based liberal arts education.

Amid such competing internal and external pressures, because of their role as managers, mentors, mediators, and innovators, academic program administrators need to develop a flexible philosophy that will allow them to negotiate an effective and sustainable role for technology in the curriculum they support. One way of thinking about administrative philosophies in negotiating technology decisions is to consider the administrator as a *technorhetorician*—that is, as an administrator who understands and has experience in technology, including the rhetoric of technology, and uses that knowledge for the benefit of as many of the program's stakeholders as possible. In using technorhetorician here, I am borrowing a term that has been widely used in computers and writing discussions to refer to computer and Internet-using teachers of composition and rhetoric.

Eric Crump defined a technorhetorician as "someone who is aware that for rhetoric, technology is a universal problem (or at least a force to be reckoned with)" (qtd. in Bridgeford, 2006) and noted that it is a term of convenience, so that those involved in discussions don't have to say "rhetor-who-happens-to-study-the-rhetorical-features-of-technological-environments" (Crump, qtd. in Doherty, 2001). In this context, I would argue that any administrator of a technology-rich program must be aware of, if not deeply understand, the rhetorical features of technological environments, for, as scholars from Nancy Kaplan (1991) to Amy Kimme Hea (2005) remind us, no technology is neutral, and all technological uses have an effect on what and how we learn and communicate. To demonstrate principles of technorhetorical administration, I draw upon scenarios and observations from my experience as a writing program administrator who has been involved in online discussions of using computers and the web to teach writing for 17 years.

National Educational Technology Standards

BALANCING TOP-DOWN, BOTTOM-UP, LOCAL, AND GLOBAL CONCERNS

All administrators and faculty members have encountered at one time or another the pressure to integrate networked computers and the Internet to provide a learning, writing, or social-networking space for students, either because our institutions decided it was time to embrace computer technology, or because we ourselves had seen the promise of these technologies. When supervisors impose technological environments on us, we may struggle to make them useful and relevant to our teaching, and when we are the instigators, we may struggle to find support among our colleagues and supervisors. With digital technologies here to stay in many programs, but the various implementations and configurations of those technologies hotly contested by the various stakeholders, the problem administrators face is how to create and maintain an environment of trust and communication in which the computer, digital networks, software, and hardware are used productively by faculty and students, are supported by the institution, and are the focus of strong faculty development efforts. Ideally, the process of supporting and sustaining such a computer-based ecology is one of identifying stakeholders, listening to global conversations on digital technology use within educational environments, adapting the principles found in those conversations to local circumstances through discussions and consensus building with local stakeholders, then acting in the best interests of those stakeholders.

Tech Forced from the Top-down

We have all likely experienced or heard some version of the following scenario: An enthusiastic administrator attends a workshop on technology and thinks that a certain course-management system (or software suite or networking technology) is the best thing since sliced bread. Before you know it, contracts are signed, large amounts of money change hands, and every course now has a new online environment. Faculty and students were likely not consulted. Training, replacement costs, and support are likely not built into the contract. Since the early 1980s, stories have been circulating about computers that became expensive doorstops (Shreve, 2002), largely because they were purchased or donated without the necessary pieces of infrastructure that would make them usable: software appropriate to the purpose, networking connections, physical space, furniture to put them on, chairs that allow ease of movement and facilitate collaboration, and, above all, training and faculty development. Recently, the media has latched onto a story about how required laptop initiatives at many schools have failed to change or improve learning (e.g., Hu, 2007). What most of the reports miss is that without faculty buy-in (along with proper hardware, software, and faculty development support), any technology initiative is doomed to failure. The following case studies illustrate some of the problems that can occur when key stakeholders do not have an active role in making technology decisions.

For a few years, I sat on my university's technology committee. When decisions about major enterprise, course-management systems, and productivity software adoptions were mentioned, I questioned whether we might look at open-source alternatives to spending millions of dollars on licenses for these products. In each case, I was summarily dismissed by others on the committee with comments that made it clear that the decisions had already been made, based on considerations such as pre-existing agreements, industry standards, and what students would be using in the "real world." Even though I was on a faculty advisory committee, I do not recall ever being asked about the really big decisions.

Stories of similar occurrences have come in from all over the country. Bradley Bleck of Spokane Falls Community College reported that in their annual technology request, his department's request for a cart of laptops was listed as the division's number one priority. Without input from those who would be teaching with the laptops, the dean decided to upscale the machines, but only two-thirds of them. The results of two-thirds of the machines being fully functional and one-third left with limited systems and software included unimagined class planning and on-their-feet pedagogical tweaking on the part of teachers, and also resulted in scheduling complexities. In addition, the class sections being made smaller to accommodate the laptops were fine from the standpoint of limiting composition class sizes, but resulted in competition for the sections, and animosity toward those who were assigned to them.

CJ Jeney (2008) remembers several years in which her student evaluation scores and comments suffered greatly when she was forced to use Microsoft Front Page in teaching web page design in her technical writing classes: "For three years I took massive hits on those end-of-semester evaluation sheets, as students fumed and spewed about the software (which, unbeknownst to them, was numerically slapping me and my teaching in the face)" (n.d.). Finally, in her fourth year, funding for alternate course technologies became available, and Jeney's evaluations shot up after she was able to bring in more appropriate and industry-standard software programs. These examples demonstrate the complicated repercussions—in such areas as budget, student evaluations, faculty morale, class size, and productivity—when key stakeholders are not consulted in technological decision-making.

The Early Adopter: From the Bottom-up

Another common story in technology integration concerns the early adopter: A graduate student or early-career faculty member who has, for instance, been strongly influenced by participating in a technology workshop or having a conversation about a new innovation with an online discussion group, works extremely hard in his or her institution to adopt new technologies in classes. But other faculty—and even some students—are suspicious, because the class and its approaches look very different from "business as usual" pedagogical approaches in the department or program. Eventually, administrators hear reports from faculty or see student evaluation forms, and investigate, often finding that some students aren't happy with the innovative approach. Sometimes the reasons are somewhat simple; for instance, students are upset because they know that previously, the course was taught in a more predictable manner. In other cases, learning and adjusting to the technology is time-consuming and frustrating to the students; to them, the drawbacks outweigh the benefits. The administrators express concern to the early innovator (sometimes with a hint that low student evaluations will cause problems with tenure, promotion, and merit ratings), and may even force her or him to discontinue the technological innovation.

Colleagues across the nation report varying degrees of success with bottom-up technological innovations. Jane Nelson (2008), an early adopter at the University of Wyoming, offered the following:

> Years ago, when we developed our first computer writing classroom, we installed Daedalus [Daedalus Integrated Writing Environment, or DIWE], which was a kind of course management system. Our IT folk were not happy about installing unknown stuff, and a person high up in the administration of IT said something cavalier like "It can't possibly be any good. It was developed by English professors." That was one of the few times I was able to force an official apology. (n.p.)

By choosing software with local stakeholder (i.e., student) needs in mind, and through success at improving writing instruction with DIWE, Nelson was finally able to impress the information technology administrators and win the right to continue using context-specific software. Her success depended on her ability to reach out and connect with stakeholders at several levels. Will Hochman (2008) demonstrated a similar ability at Southern Connecticut State University, where he resisted using the campus-wide course-management system in favor of The Writing Studio, a free online writing environment created by Mike Palmquist at Colorado State University. According to Hochman: "Instead of top down, one-size fits all CMS, we customize our writing spaces easily at the bottom up level of student and teacher. Ironically, when push comes to shove and my school gets wise about e-portfolios, we will already be doing that so fluidly in The Writing Studio. . ." (n.p.). Kathie Gossett (2008) told a similar story based on her experiences at the University of Illinois, where the campus adopted WebCT, which worked well for the sciences, but not for composition. In reaction, considering local needs, faculty in the English Department installed Moodle on their own server, and, recognizing the success of their pilot, the entire college adopted Moodle as its default course-management system. Again, the local needs of writing teachers and students took precedence over campus-wide, "one-size-fits all" technology implementation, and in all the cases above, writing teachers knew how to talk to administrators and back up their claims with evidence. Based on local, national, and published evidence, my current writing program has made a similar choice, preferring the simplicity of WebBoard software to the top-heavy course-management system adopted and supported on my campus. But we are lucky enough to have a full-time technology support staff member and control of our own server; otherwise, choosing alternative software for our program might not have been an option.

I did not have the benefit of such support and cooperation—that is, both top-down and bottom-up—when, as a new faculty member at a state technological university in 1992, pumped up by computers and writing discussions on email lists like MegaByte University (MBU-L), I asked advanced technical communication students to use Internet discussion groups for class discussions and outreach to professionals in their chosen fields.[1] Seasoned veterans of the university in their upper-class years, these students had anticipated the paper-and-speech-based class that had been taught by a very popular faculty member in the past, and they were disgruntled that they did not get the class they expected. Here was an untested new faculty member spouting unsubstantiated claims about the power of the Internet to connect people and to foster new kinds of collaboration and discussion. What's more, the students had to learn how to use their email accounts, learn how to subscribe to discussion groups, learn a bit about netiquette, and put up with countless failures in modem and networking technology. It was a big change for them, so who could blame them for complaining to their major department chairs, the deans, and even the vice president of the institution? One student went so far as to threaten to sue me for breach of contract, because the Internet was not listed in the course description.[2] The engineering department chairs asked me to attend a meeting at which they roundly admonished me for using technologies "that had nothing to do with teaching the students how to write," and—short of demanding that I stop using online discussion—strongly recommended that I tone it down and make Internet activities optional.

Dutifully, I scaled back on the networked discussion requirements, but, in the ensuing years, it became almost painfully obvious that Internet-based writing would become a crucial activity for technical communicators, and the lab-based and online activities were finally accepted into my writing classes when other writing teachers also integrated them. We succeeded in getting support for email lists, class web pages, and rooms with instructor computers, Internet access, and projection screens (so-called "smart classrooms"), but struggled to secure lab space for the writing classes to meet, even once in a while. I had to beg one of our engineering departments to use its lab once every 2 weeks, so that students could practice their writing and use the Daedalus Integrated Writing Environment for prewriting, peer review, and class discussion.[3]

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[1] Described in detail in "Writing in the Matrix," a chapter in Galin and Latchaw's The Dialogic Classroom" (Day, 1998).

[2] This lawsuit magically disappeared when, in the vice president's office, I produced a print copy of an email in which the same student threatened to physically assault me.

[3] I then used the Megabyte University online discussion not only to ask questions about how to make use of one lab, set up in rows, not pod or perimeter seating (the topic of computer classroom setup frequently came up online), and later as a sounding board for planning and proposing a computer classroom to be used by writing classes alone. I was also able to view other schools' proposals and plans, as well as share my rationale and plans with others, thanks to the online network of colleagues more than happy to share and conspire. Then, made optimistic by what I learned of the efforts of colleagues across the country to put in computer classrooms, I secured funding through a curriculum redevelopment grant competition. Then the real fun started; I was ultimately unable to get any campus entity to allocate a space for the classroom, and had to give up the idea. I eventually moved to a university that already had required, allocated lab time built into the curriculum, but before leaving the technological university, I hosted a computers and writing conference there.

Daedalus (Daedalus Integrated Writing Environment, or DIWE)

The Writing Studio

Moodle

WebBoard

MegaByte University (MBU-L)

Local and Global Consensus Building

What do these stories tell us about sustainable ecologies of technology use? They draw our attention to the need for complementarity between local and global consensus-building among stakeholders. It wasn't enough for me to have the general agreement of the entire computers and writing community behind me if I could not gain the trust and support of the local campus community. In retrospect, I should probably have spent my first year at the state technological university learning the culture, teaching a fairly non-controversial syllabus, and meeting as many stakeholders in the teaching of writing as I could. These stakeholders are students (who can be approached through honor societies, clubs, and surveys); other faculty who teach the courses; support staff such as librarians, information technology personnel, and room schedulers; faculty development and curriculum committees; and administrators at all levels who care about student writing and communication skills. Then, depending upon what I learned, I could have introduced online activities into my courses gradually, seeking feedback along the way through frequent formative teaching assessment activities, such as 1-minute response papers and small group instructional diagnoses. I might also have formed a committee that included stakeholders from a variety of campus constituencies to try to make the computer classroom a reality. But the most important lesson to be learned from this experience is that scholars and teachers at every level need to make connections, form collaborations, and build communities with stakeholders across their programs, departments, and universities.

How do teachers and administrators develop and maintain relationships with stakeholders? Although Kimme Hea (2005) looked primarily at relationships between academic and client constituents in service-learning contexts in her article “Developing Stakeholder Relationships: What's at Stake,” her research can inform our thinking on how to sustain technological ecologies in educational institutions. Situating participants as stakeholders—as “the many individuals and groups in an organization ‘who can affect or [be] affected by the achievement of the organization's objective'” (Freeman, 1984, qtd. in Kimme Hea, p. 56)—Kimme Hea grounded stakeholder theory in Foucauldian and feminist ethics. She also drew from Brian Burton and Craig Dunn, who, in Kimme Hea's words, “suggest that feminist ethics can inform stakeholder theory through a discussion of responsibilities and concrete, lived realities versus rights and abstract principles” (p. 59). Although some of Kimme Hea's suggestions for rethinking corporate systems may sound utopic, her suggested basic principle—creating dialogue where multiple voices emerge and are appreciated, and shared goals and mutual growth are central—can help faculty and program administrators alike develop stakeholder-based approaches to technology-linked educational initiatives.

In short, the problem I encountered at my former institution stemmed from basing my efforts on the advice of outsiders without thoroughly consulting local stakeholders about the possible challenges and consequences of the changes I wanted to make. I was sure that my discussion list colleagues had the right ideas for using computer and network technologies in the writing classroom, but I had not consulted with more than one colleague at my school (who had been instrumental in hiring me and thus was quite familiar with my background and work), about how those ideas would or would not fit the local context. In a recent post to TechRhet, Danielle DeVoss (2008) put her finger on a major concern for early adopter technorhetoricians who keep in touch daily by email.

> Are we talking to each other too much? And making too many assumptions about what "our colleagues" are doing? And by "our colleagues," I don't just mean the—to be honest —handful of us on this list and who go to Computers and Writing and religiously read *Kairos*. I'm talking about the thousands and thousands of others who live and work in places where they have to fight very, very hard to do the sort of stuff we have our "undergrads do all the time. (n.p.)

DeVoss understood the danger of making assumptions about the technologies our local and distant colleagues can use and will be permitted to use in their programs and classes. She reminded us that, to many of our colleagues, "this sort of work IS new and has to be contextualized and historicized and explained and theorized." And that process of contextualizing, historicizing, explaining, and theorizing must take place in local as well as national and international communities of practice.

Seeking out Stakeholders

When I moved from the small state technological school to a larger state university, I remembered that educators have an opportunity to reinvent themselves when they change institutions. After making the move, I did my best to learn from my failures at my former institution, and I had a 3-year grace period before becoming WPA. At my current institution, the previous WPA had already built strong consensus among stakeholders. Well-aware of national trends in computers and writing, this WPA had worked with the General Education Committee, which needed some guarantee that students would have training in electronic and online tools for writing and communication and that such training would be a core part of the mission statement, goals, and outcomes of the writing program's first-year courses. Then, working with Information Technology Services and Residence Hall personnel, he arranged an agreement guaranteeing that every first-year writing class would meet in a computer classroom at least once a week. With the former WPA as my model, I was acutely aware of the precedence for listening to as many constituents as possible in the process of making decisions about programmatic initiatives and change. So, although I still continued to read online lists such as TechRhet for ideas, I also paid close attention to what is going on locally in the program, and, as much as possible, let stakeholders have a major say in the directions we take. Our first-year composition program has an assistant director, a technology coordinator, and a committee composed of administrators, supportive professional staff, instructors, teaching assistants, and at least one undergraduate student. If I have ideas for initiatives—gleaned from email discussion lists such as TechRhet or WPA-L—I take them to the committee first, and they decide whether and how to pursue them. This is the process we used over a full year to review the national WPA Outcomes Statement and come up with a version that fit our own program.

A good administrator also has to be open to ideas that come from others, and the members of the committee have been excellent at soliciting suggestions for ways that we could support each other better. It was the committee's idea to start the successful First-year Comp First Friday Colloquium series, and the committee works with everyone teaching in the program to find speakers and topics, all local and home-grown, for the monthly event. They also liked the idea of hosting an event like the Celebration of Student Writing developed at Eastern Michigan University, and our school held its first annual Showcase of Student Writing in spring 2008. Under the coordination of my assistant director, the committee oversees articulation and calibration sessions every semester, and also attends to such areas as working conditions, publisher relations, our custom handbook (including an online classroom environment), our program web site, and recommended textbook lists.

Aggressively seeking out stakeholders across campus, I regularly consult with my chair, along with the dean and associate deans of my college, to be sure that our technological efforts are coordinated. As a member of the steering committee of our pioneering developmental program for students from disadvantaged area high schools, I work to insure that we have the best instructors and technology in place. Because we have so many ESL students, including graduate students who must take a version of our composition sequence, I coordinate our efforts with the department's ESL director and the international programs office. And because about a third of my program's classes meet in residence hall classrooms and labs, I have developed a very close working relationship with the Residential Technology Coordinator, who, in the last 3 years, formed a task force of diverse stakeholders to upgrade and improve technology and learning environments for first-year composition students and instructors. Working with input from administrators, instructors, teaching assistants, and students, the task force completely remodeled and "smartened" our residence hall composition classrooms, and upgraded the residence hall labs used heavily by first-year composition classes. Our library education coordinator also works hand-in-hand with the writing program to help insure that the research process in our classes goes smoothly and students learn strategies for accessing both print-based and online sources for their research projects. A few years ago she introduced an innovative electronic tutorial and scavenger hunt for students, and now all library orientation sessions are held in a state-of-the-art computer lab.

WPA Outcomes Statement

English Composition Outcomes

Eastern Michigan University Celebration of Student Writing

Technorhetorician WPAs Addressing Assessment

All innovative initiatives require regular phases and processes of assessment, especially technology initiatives, which, in some senses, are a moving target due to regular changes in the technology itself. Thus, although the characteristics we value in good writing may remain the same, the tools with which students craft, compose, and deliver their writing change shape, and taking this into consideration must be part of assessment processes. Because assessment tends to be the "elephant in the room" at most colleges and universities, with a great deal of external and internal top-down pressure, the technorhetorician administrator needs to pay special attention to this key component of academic program success. Following

Ed White's (2005) rule of assessodynamics, "assess thyself or assessment will be done unto thee," we decided to take no chances, and we proactively developed a first-year composition program assessment, based on the Council of Writing Program Administrators' Outcomes Statement, but including technology outcomes, with input from all teachers in the program. Then, with help from the Inter/National Coalition for Electronic Portfolio Research and our campus assessment office, we piloted an electronic portfolio assessment project that included our new teaching assistants, who coach students on creating reflective electronic portfolios and themselves create reflective electronic teaching portfolios. Each year, two portfolios are selected at random from each section of first-year composition, and scored by our program's core competency assessment team. We use this data to chart our progress on a number of axes, as well as to determine where we need more faculty development efforts.

The campus assessment office supports our efforts, but we have not been as successful as we would like in two areas. First, because we have not mandated electronic portfolios for all instructors and all teaching assistants in the program, about two-thirds of the first-year composition sections are not involved in the assessment (although they do collect paper portfolios). Second, we had great hopes for making the first-year composition electronic portfolio the starting point for a longitudinal electronic portfolio that would follow students through their years at the university. In 2005, my institution hosted a portfolio conference that brought together various stakeholders across the university, and we thought we had reached the critical mass to be able to coordinate longitudinal electronic portfolio efforts with others on campus. Yet, no follow-up meetings were called to keep the ball rolling, and stakeholders—uncertain of higher administration buy-in and wide-spread campus support—went back to their local, program-specific efforts.

Currently, our university is in the midst of a strategic planning initiative, and, in consultation with stakeholders such as the General Education Committee, Writing Across the Curriculum, Faculty Development, and the Office of Assessment, we have proposed a longitudinal electronic portfolio pilot to increase student self-evaluative skills and investment in learning. Time will tell whether the idea will catch on, but two important concepts are at work here: First, the technorhetorician administrator must not be discouraged when initiatives seem to go nowhere; she or he must regroup, reassess stakeholder needs and values, then reformulate rhetorical appeals and approaches based on those needs and values. Second, current wisdom in program assessment suggests that locally developed, context-specific efforts may be more authentic and effective than campus-wide or externally developed assessments, which may ignore or subordinate the program's goals and outcomes for the sake of comparability (Broad, 2003; Camp, 1990; Wiggins, 1990). In sum—in terms of assessment, and, indeed, most of the situations described here—the technorhetorician administrator should be able to stay focused on local stakeholders while keeping concentric circles of stakeholders at the department, college, university, national, and global level in mind.

English Composition Technology Outcomes

Inter/National Coalition for Electronic Portfolio Research

ePortfoliating the Writing Program: Assessing Realities, Measuring Change, Spreading Reflective Practice

LISTENING TO GLOBAL CONVERSATIONS

As scholars and teachers, it is a given that we do our best to listen in on and contribute to the scholarly conversations that inform our field, and scholars like Rose and Weiser (1999, 2002) remind us that administrators, too, need to participate in scholarly discussions, so that theory and everyday decision-making are integrated at every level of the administrator's position. Frankly, the everyday decision-making and seemingly mundane aspects of our administrative lives are often invisible—at our institutions and in our journals. A good way to keep up to date with knowledge in any field—and to find everyday practice often scaffolded by theory and research—is to subscribe to an online discussion group (Day, 1998). Where print and online journals and book-length work provide the field with milestones every few months or years, online discussions reflect the day-to-day thinking within a discipline, and through question and answer can tap into the knowledge of what Howard Rheingold (1993) called a *living database*, which connects thousands of professionals working on similar problems within similar institutional constraints. Thus, where journal articles and scholarly monographs report on research and pull the field ahead in large steps, online discussion provides situated knowledge, suggestions, and advice in smaller increments, on a day-to-day basis, at the point of need. All scholarly research is iterative, in that researchers respond to each other in the pages of their books and articles, and both books and articles sometimes go into subsequent revisions and editions. Yet online discussion is iterative on an accelerated time scale, with some discussions drawing hundreds of replies within a few days.

Within this framework, because of a pressing, immediate need to make programmatic decisions, the busy administrator must often look to others for advice on what to do and how to provide a rationale for decisions. Of course, one of the first places to turn for advice is to colleagues and supervisors in one's home institution, but chances are that no one at the institution will have encountered the same problem, or, perhaps, the problem is so deeply institutionalized that it is not recognized as a problem. In this situation, tapping the living database may be very helpful, in that professionals who have faced similar issues, problems, and decisions will be able to provide personal advice, share rationales for actions taken, and even help the busy questioner with references to particular journal articles and books that may be of assistance. Like the major professional organizations and conferences—such as the Modern Language Association, Conference on College Composition and Communication, Council of Writing Program Administrators, and Computers and Writing—these discussion groups form communities of theory and practice, themselves ecological systems that expand and contract, merge, morph, and sometimes even die off.

Tapping the Living Database

In this regard, my experience as a technorhetorician who has actively tapped the living database of rhetoric and composition scholars may offer an instructive example of an individual administrator's relationship to larger external systems that influence the ways we learn, change, and grow in and with technology. In contrast to some of my colleagues, who consider online discussion a bothersome mix of spam and storytelling, I have reached stride as a faculty member, professional, and administrator largely due to the support of a larger community of online colleagues, a group of technorhetoricians dedicated to helping each other teach and do research in the fast-changing world of digital writing technologies. I was about to abandon graduate study when I first discovered and subscribed to online communities such as MegaByte University, Purtopoi, and Wcenter, and received so much encouragement that I stayed and completed a PhD program. Once a faculty member, faced with the opposition to my use of Internet communications, which I describe above, I depended on the advice and support of my distributed colleagues so as not to be overwhelmed, even in the face of the aforementioned threat by the disgruntled student who felt that requiring Internet use in such a class constituted a breach of contract. In subsequent years, when there seemed to be no hope for getting research done on top of a 4/4 teaching load with heavy service requirements, my online peers kept me informed, included, and involved in scholarly publication and presentation opportunities. Having joined the virtual community of technorhetoricians, it was harder *not* to participate in collaborative scholarly endeavors than it was to participate. The focus was less on the difficulty of publishing or of traveling and delivering conference presentations, and more on the engagement and excitement of doing so. In short, the living systems of various external communities of practice, both online and off, caught me up in a flow of ideas and innovation that led me to believe that I could make a difference both locally and globally.

Using the Wheel, Not Reinventing It

To tap the global living database and feed advice into a local context, I consult with my online colleagues at least every week or month on topics such as faculty development and policy decisions. Administrators have no reason to reinvent the wheel when it comes to important programmatic functions. For the past 9 years, I have co-taught our pedagogy seminar for new teaching assistants; to find out what's new and get students practical advice from others in the field, I reach out to members of discussion lists for advice. When I first took on the class, I asked members of WPA-L "What one piece of advice or information do you wish that you had been given just before you jumped from the frying pan into the fire of your first first-year composition class?" and received an incredibly diverse and helpful collection of responses from 21 colleagues at diverse institutions across the U.S. and in Egypt. Students not only appreciated and discussed the advice, but were drawn into the conversation as participants. Later that same academic year, four of the students from that same class participated in creating a module and leading a discussion on technology and writing instruction on the Teaching Composition web site and email list, beginning their trajectories as technorhetoricians. The graduate students were caught up in the flow of ideas, sustaining their interest and involvement in local and global computers and composition ecologies.

WPA-L

Teaching Composition

Local Issues, Global Support

Like many other administrators, when I encounter troublesome policies, I often compare notes with colleagues in similar positions at other institutions. In the wake of the Virginia Tech shooting incident of 2007, for example, our student services coordinators instituted a policy that all "disturbing writing" needed to be reported to the judicial office. To get a sense of how other institutions, and specifically writing programs, were responding to similar concerns and pressures, I asked for help on the WPA-L list and received 18 thoughtful replies that I used to balance my understanding of local needs against more global concerns and to craft an informed response to student services. In turn, the online and local exchanges informed a faculty development event on responding to disturbing student writing.

Then, on February 14, 2008, a similar shooting occurred at my own institution, and although initially stunned, I quickly made use of the lifeline of online community for support and advice as our university struggled to get back on its feet. In the days and weeks following the shooting, I received hundreds of emails of sympathy and encouragement, many with suggestions in response to the following questions:

1. How do we balance the needs of some students to acknowledge and express emotions about what has happened against the needs of other students to just move on?
2. How could or should we help students use writing in our classes to process their emotions?
3. Could or should writing about the recent events become a topic (optional seems best) for formal writing assignments in first-year composition classes, or is students' emotional closeness to the events just going to cause them problems writing analytically or argumentatively (most classes have a research project coming up)?
4. What important questions relating to our writing teachers' readiness to meet the needs of their students am I forgetting? (Day, 2008)

Predictably, the most on-target suggestions came from colleagues at Virginia Tech, where they were still healing from their own tragedy 10 months earlier and knew precisely what we were feeling and facing. But, overall, like an emergency response team, the online community rallied to help us, and within 24 hours of asking the questions above, I had put together a plan for four afternoon workshops for the 90 faculty in my program. Each workshop, limited to 25 participants, involved work with a professional counselor, feedback, small-group discussion, and planning what to do when classes resumed the following week. Making use of our own local technological ecology, we kept each other updated by email and created a webboard for sharing strategies for dealing with our own emotions and those of our students, as well as appropriate poems, artwork, and songs to help us cope.

SUSTAINING ONLINE COMMUNITIES OF PRACTICE

Recognizing Work

Like local technological ecologies, the global online communities that support our practice are also vulnerable to the winds of change; they cannot survive unless technorhetoricians can support them. Over the years, my connections to various communities have changed as organizations sprang up, merged, morphed, and some, like the Alliance for Computers and Writing (ACW), expired. In my early technorhetorician years, I was part of the MBU-L discussion group, but by 1995 ACW-L, an offshoot of the newly formed ACW, had outgrown MBU and took its place. ACW was a coalition of teaching and business partners dedicated to supporting the work of technorhetoricians, and the fact that it did not survive provides a good example of a composition ecology that was unsustainable. Although almost all computers and writing professionals vocally supported its existence, ultimately institutions such as universities and publishing corporations were unable to provide support to an individual or group that could update the resources it collected, as well as coordinate its activities. Those most interested and involved were faculty and support staff at colleges and universities, dependent upon the reward systems of tenure, promotion, and merit pay, and those systems did not provide adequate reward for those involved in distributed collaborative communities.

Despite resolutions, position statements, and guidelines from professional organizations—including the Conference on College Composition and Communication the National Council of Teachers of English, and the Modern Language Association—tenure, promotion, and merit evaluation procedures have been slow to change at most universities. Personnel committees often discount or underestimate online collaborative activities because they do not understand or value them, cannot find appropriate categories in protocol documents, and may be suspicious of evidence (such as email posts, which are often short, provisional, and unpolished) or web pages (which may unwittingly take on the appearance of commerce or self-promotion). Thus, volunteers who have come forward to work on initiatives like ACW ultimately have had to put those efforts second to the business of institutionally based service work and traditional refereed scholarly publication, and, with links becoming outdated every week or so, once-flourishing public clearinghouses quickly go out of date. Technorhetoricians need to find better ways to take part in and be rewarded for the care and feeding of their online communities by making their contributions (as well as the impact of these communities on their practice) visible in annual reviews, tenure and promotion documents, and media releases.

Technorhetorician administrators also need to take part in national and local conversations on the value of online communities in the major academic categories: teaching, scholarship, and service. They need to advocate for ways to make online scholarly engagement count for more than just idle chat among so many geeks at the electronic water cooler. The CCCC Promotion and Tenure Guidelines for Work with Technology and The MLA Guidelines for Evaluating Work with Digital Media in the Modern Languages represent a step in the right direction, but much more work needs to be done. Because we must find ways to justify the work we do in and with online communities, technorhetoricians will need to take key leadership and committee positions at local and national levels to effect the kind of systematic change needed to sustain online communities of practice.

CCCC Promotion and Tenure Guidelines for Work with Technology

MLA Guidelines for Evaluating Work with Digital Media in the Modern Languages

Sustainable, Small-scale Ecologies

In some ways, the ACW was just too large and amorphous an organism to be sustained at the intersection of academic reward systems, publishing, and grass-roots collaborative efforts in computers and writing. As an ecological system, the computers and writing community has more recently put its energies into smaller, more sustainable journals and collaboratives. Some larger-scale sites, such as computersandwriting.org,

Computers and Composition Online, and *Kairos* have taken over some of the functions of ACW, but one notable model of a sustainable small-scale educational ecology is Interversity, a collective that survives to a large degree because of its rejection of the administratively top-heavy, place-based educational institution. Outside the limits of institutional policy and reward systems, Interversity can respond to the more immediate needs of online communities and movements, providing web hosting, clearinghouse storage, blogs, wikis, and threaded discussions to those who need these services. According to Eric Crump, Interversity's founder and chief technorhetorician,

> Interversity is a place where people can teach what they know and learn what they don't (to swipe a phrase that once graced the old dejanews website). We like to think of Interversity as a bureaucracy-free zone, a place that exists outside the world of institutional education, outside the influence and constraints of curricula, accrediting agencies, administrators, legislators, and all the other folks who tell us what to learn and how. And if not outside, then at least comfortably on the margins, off the institutional radar screen. When it comes to learning, we decide. (n.d.)

In an educational setting currently dominated by the 500-pound gorilla of No Child Left Behind (which many of us prefer to call No *Test* Left Behind) and the specter of machine grading of writing further widening digital divides, online educational co-ops such as Interversity offer an online space where, regardless of institutional affiliation or lack thereof, teachers can focus on setting up resources and providing discussion spaces to learners and other groups who need them. And they can set up these spaces on the fly, without waiting for institutional approval or risking censorship.

Further, even if it isn't a matter of free speech, sometimes the frustration of top-heavy bureaucracy—with its forms in triplicate, fees, and months of waiting—can lead technorhetorician educators to look for other solutions. After the NCTE web and discussion group server crashed in 2004, a system to replace it was slow to come online. When it did finally reappear, the email discussion groups had been replaced by web-based bulletin board areas for each group, such as the NCTE-Talk discussion group and all the affiliates of NCTE and CCCC. But the constituents, including the NCTE "talkies," were not comfortable with this solution, and voted with their feet by not using the new spaces. Although I begged the members of the CCCC committee I chaired to join the discussion in the official web space, nobody showed up. Committee business was at a standstill, so as a responsive technorhetorician committee chair, I had to act quickly. I contacted Eric Crump at Interversity, and within a few hours I had two email discussion lists—one for internal committee business and one for the committee's informal task force—up and running. By choice, the committee uses these lists to this day.

A year or so later, the same committee and its volunteer task force decided it needed a consistent web page so that colleagues looking for information about the annual Computers and Writing Conference could always find the call for proposals and the conference site, despite the fact that a different institution hosts the conference every year. With the help of Interversity, in collaboration with a publisher (who covers web hosting fees) and techno-gurus in the field, computersandwriting.org (a drupal site), was born. Now the computers and writing community has a central clearinghouse site for information related to its main conference, hosted on Interversity and maintained by task force volunteers.

Even more recently, ad hoc computers and writing-related groups have sprung up on social networking sites like Facebook, but these groups have little control over the design and functionality of the online sites and must follow the host organization's commodity-driven template for what constitutes community. Reacting in part to the co-opting of online communities by big business, Anne Wysocki (2008) suggested that teachers could look for ways "to respond or be contrary to" the commercial templates for engagement designed by publishers and online services for us to inhabit by imagining and creating new venues for writing, community, and action. "If these spaces are created so that our imaginations become the property of others," Wysocki asked, "Where is the space for small groups, modest, generous, gentle, deliberate, and freely political, to engage?" Like Wysocki, I believe that as educators, tehnorhetoricians can and should respond to or resist large-scale, commercial community-building by forming and maintaining smaller-scale intentional communities of practice that fit with local contexts of value and belief. Interversity may be one such online space for community, but even this innovative site, now in its tenth year, is in danger of failing if the community cannot continue to sustain it with donations to keep the server going and the chief technorhetorician's family fed.

As demonstrated in these examples, Technorhetoricians were able to provide information and support to meet community members' changing demands. Sometimes called "nimbleness" or "strategic agility," this responsiveness allows groups to avoid the top-heavy and complex organizational structures of the sort that plagued the Alliance for Computers and Writing and seem to be much less a concern for Interversity. Nimble, responsive groups that form, migrate, and reform online can often resist central control and top-down bureaucracy, and, instead, provide fluid and timely advice and resources for stakeholders around the world. Technorhetoricians must continue to be the caretakers of these important resources, advocating locally and nationally for their survival.

Computersandwriting.org

Computers and Composition Online

Kairos: A Journal of Rhetoric, Technology, and Pedagogy

Interversity

Committee on Computers in Composition and Communication

THE TECHNORHETORICIAN WPA

As I hope the examples in this chapter have demonstrated, sustaining technological innovation and integration requires administrators to be flexible and balanced not only in listening to external colleagues, but also in identifying and considering the needs of as many internal stakeholders as possible. In 2004, in response to a query on the WPA-L list, I began outlining an administrative philosophy for WPAs, which became the topic for a roundtable at the 2005 WPA conference. Because it may be a helpful starting place for administrators and teachers involved in sustaining technological ecologies at their institutions, I present a modified version here. The technorhetorician administrator:

- identifies, seeks out, and listens to stakeholders including students, colleagues, supportive staff, and higher administrators;
- learns as much as possible about available technologies for teaching, but always considers technologies in terms of the program's goals and outcomes, as well as its limitations;
- shares governance and decision making in technology choices;
- balances the technology needs of teaching staff with the needs of the upper administration;

- keeps abreast of global conversations on technology, but balances external advice about technology against local constraints, concerns, and opportunities;
- advocates for and helps maintain online communities tailored to the needs of local and global stakeholders;
- advocates for ethical treatment of colleagues and employees who teach, publish, and collaborate in digital and online environments in matters of hiring, tenure, promotion, and merit;
- advocates for the program to upper administration, the rest of the university, and the public;
- advocates and promotes faculty development in using technology for program teaching staff;
- advocates and promotes authentic program assessment using appropriate technologies;
- advocates for students, to be sure the program treats them fairly and that they have access to computers and online resources;
- provides adequate technological training for graduate students, including a pedagogy class, mentoring, and workshops;
- publicizes good writing and good teaching whenever possible, online and offline (awards, press releases, etc.); and
- advocates for best practices in teaching with technology, but does not lockstep everyone in the program to the same book, software, and syllabus.

As an ancillary to this chapter, to help teachers and administrators make informed technology decisions, I have created the web site the WPA as Technorhetorician. The site outlines a series of practical questions and strategies that will guide teachers and administrators through the process of identifying stakeholders, learning about their needs and limitations, gathering field-specific information for technology decisions, balancing local and global concerns, providing access to resources, fostering faculty development, paying attention to assessment, documenting and publicizing program achievements, and balancing the concerns of publishers and software providers with student needs and program goals. In the spirit of technorhetorical collaboration, cooperation, and community building, I invite readers to contribute to this web site by emailing me at **mday@niu.edu**.

The WPA as Technorhetorician

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CHAPTER	7
TITLE	Sustainability and Digital Technology: Program Analysis Via a “Three-legged” Framework
AUTHOR	Patricia Ericsson
OVERVIEW	This chapter introduces and analyzes the interdisciplinary Digital Technology and Culture (DTC) program at Washington State University (WSU) through a lens of sustainability. This analysis considers the challenges that come into play when an interdisciplinary major conceived at a small branch campus and designed to meet the real needs of the technology-rich work-world moves to a century-old land-grant campus. In addition to considering the challenges inherent in establishing such a program, I explore the long-term challenges of sustaining a technology-rich, interdisciplinary degree program. Beyond analyzing an existing program, this chapter illustrates how the tenets of sustainability can be a valuable tool for program analysis. I conclude the chapter by offering four sustainability-anchored recommendations for those considering or developing technology-rich programs.
TAGS	administrator*, Brundtland Report, conflation, Digital Technology and Culture, director, DTC, ecology, economic, faculty, interdisciplinary, knowledge ecology, media, Patricia Ericsson, program, social, state-wide, sustain*, sustainable development, technolog*, three pillars, three-legged stool, Washington State University, WSU, WSU-V
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Sustainability and Digital Technology: Program Analysis Via a "Three-legged" Framework

A Report on the Development and Sustainability Efforts of the Digital Technology and Culture Degree

Patricia Freitag Ericsson

Two intersecting interests fueled my interest in this collection—the first being my overall interest in the rhetorics of sustainability. The second was a curiosity about whether a sustainability framework might be used to analyze an academic program and what such an analysis could uncover about that program. The program I was interested in analyzing was the Digital Technology and Culture (DTC) degree program at Washington State University (WSU) in Pullman. I became the director of this technology-intensive interdisciplinary major when I arrived at WSU in fall 2003 and found that part of my job description was to "grow the DTC degree." I knew little about the degree, which had become a stand-alone degree program in spring 2003 (just before I arrived), but found a handful of students who knew about DTC and were ready to take courses. We immediately found challenges—challenges that writing this chapter helped me understand better. The analysis has also convinced me that we have grown a sustainable program—one in which balancing the social, economic, and the ecological pieces is tricky, but possible.

This chapter begins with the rhetorics of sustainability. The first section of the chapter defines sustainability and sets up an analytical framework specifically designed for considering technology-rich academic programs. In the remainder of the chapter, that framework is used to analyze the DTC program. Concluding the chapter, I provide four recommendations that come directly from the sustainability analysis outlined in this chapter. Despite the overuse and misuse of the term *sustainability*, the process of writing this chapter has led me to believe that considering academic programs through a carefully considered sustainability framework can help us to understand and build better academic programs.

DEFINING SUSTAINABILITY

In 1993, environmental historian Donald Worster was concerned that the popular use of "sustainability" was beginning to wear thin, and that the ideal of sustainability was presenting us with a "bewildering multiplicity of criteria" that needed sorting. Worster also complained that each disciplinary field had its own "peculiar" notion of what sustainability is. In the early 21st century, the term sustainability is wildly popular, carelessly tossed about, and used for describing widely different situations—from the Dow Jones Sustainability Index, to individual lifestyle choices, to the kind of peace the Bush administration sought in the Middle East. In attempting to use the term sustainability in any critical approach, care must be taken to avoid the primary pitfall that Worster identified more than 15 years ago—in its wide acceptance as a laudable goal, sustainability might well have lost any "real substance" (p. 133).

An important and often-cited definition of sustainability emerged in a 1974 document published by the World Council of Churches (WCC). The definition, drafted by the WCC's Conference on Science and Technology for Human Development, sets out four criteria necessary for a sustainable society:

> First, social stability cannot be obtained without an equitable distribution of what is in scarce supply or without common opportunity to participate in social decisions. Second, a robust global society will not be sustainable unless the need for food is at any time well below the global capacity to supply it and unless the emission of pollutants are well below the capacity of the ecosystems to absorb them. Third, the new social organization will be sustainable only as long as the use of non-renewable resources does not out-run the increase in resources made available through technological innovation. Finally, a sustainable society requires a level of human activities which is not adversely influenced by the never-ending large and frequent natural variations in global climate. (qtd. in Dresner, 2002, p. 29)

According to *Principles of Sustainability* author Simon Dresner (2002), this definition was "proposed by Western environmentalists in response to developing world objections to worrying about the environment when human beings in many parts of the world suffer from poverty and deprivation" (p. 1). The WCC definition has a significant anthropocentric focus, weighing heavily on the value of human beings, with nature's worth "derived primarily from its capacity to serve human ends" (Satterfield & Kalof, 2005, p. xxii). The environmental movement of the 1960s and early 1970s had been criticized as lacking interest in humans, with critique often focused on the advocates of "deep ecology." The deep ecology approach to environmentalism, first outlined by Norwegian philosopher Arne Naess, has been characterized as radically biocentric: a position that "respects all living organisms; because nature is alive, it is regarded as 'good' in its own right and thus deserving of moral consideration" (p. xxiii).

According to Worster (1993), the idea of sustainability came about as some environmentalists were looking for a "less intimidating way" to make needed environmental changes. In addition, scholars like Lester Brown (1981), author of *Building a Sustainable Society*, argued that "the survival of civilization depends on pragmatic, not ideological, responses to the forces now undermining it" (p. 350). Most scholars agree that the sustainability movement's prominence began in 1987 with the United Nation's World Commission on Environment and Development publication of *Our Common Future*, usually referred to as the Brundtland Report. In this report, sustainability moves from a single-word idea to a two-word concept: no longer is it simply sustainability that is defined, but *sustainable development*:

> - development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts:
> - the concept of "needs," in particular the essential need of the world's poor, to which overriding priority should be given, and
> - the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs. (World Commission, p. 43)

Despite criticism, refocusing sustainability as sustainable development certainly qualifies as pragmatic rather than ideological, and most recent definitions of sustainability grow out of the Brundtland Report. In *Technology and the Contested Meaning of Sustainability*, Aidan Davison (2001) wrote that the report "arguably remains the manifesto for sustainable development policy" (p. 12).

Since the early 1990s, the sustainable development paradigm has become the mainstream understanding of sustainability, with definitions regularly positing a three-part definition of the term.[1] For example, in 2002, the Scottish Environment Protection Agency articulated this three-part definition on its Web site:

> A simple way of picturing sustainable development is to think of it as a stool with three legs, representing the environment, the economy and society. If any leg is more or less important (i.e., shorter or longer than the others, the stool will be unstable—but perhaps still usable—at least for a while). If any leg is missing, the stool simply will not work. But if all three legs are the same length (i.e., environmental, economic and social considerations have been given equal weight), the result will be a well balanced stool which will serve its purposes indefinitely—a sustainable stool. (online)

In another example, in 2005 the Canadian Commissioner of the Environment and Sustainable Development provided a gloss of the Brundtland Report's contents, stating that it was focused on three pillars of human well-being:

- Economic conditions—such as wealth, employment, and technology;
- Socio-political conditions—such as security and democracy; and
- Environmental and resource conditions—such as the quality of our air and water and the availability of capital in the form of natural resources. (Office of the Auditor General of Canada, online)

Disagreements about the appropriateness of the three-legged stool model have been many. In 2003, conservation biologists Neil Dawe and Kenneth Ryan argued that the three-legged stool metaphor is faulty because "humanity can have neither an economy nor a social well-being without the environment. Thus the environment is not and cannot be a leg of the sustainable development stool" (p. 1459). Dawe and Ryan argued that the environment is the "floor" or the "foundation" of well being. This position is often taken by those who hold a more biocentric ideal that harkens back to the earlier environmental movement. Economists tend to believe that the economic leg is the most important and the foundation of any sustainable development. In 2005, agricultural economist John Ikerd claimed that all three of the legs of the stool were essentially economic ones and that sustainability is a "long-term, people-centered concept." Ikerd admitted that this is an "anthropocentric interpretation of sustainability" and argued that even though "we are concerned *uniquely* with sustaining the human species [that] does not dictate that we are concerned *exclusively* with sustaining the human species" (pp. 122–123).

Despite some differences, most mainstream understandings of sustainability in 2008 consider it a dynamic process in which the social, economic, and ecological are interrelated. This chapter will consider the three elements of sustainability as relatively equal in importance and look at each one in some detail.

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[1] Although conflating sustainability and sustainable development might be an arguable step, for convenience it will be done in the rest of this chapter.

SUSTAINABILITY IN THE CONTEXT OF HIGHER EDUCATION: AN OVERVIEW OF THE THREE LEGS

Although not often conceptualized through the lens of sustainability, university degree programs are dependent on the economic, the social, and the ecological, and program administrators face the tricky task of keeping them in balance—keeping that three-legged stool well-supported. To make this framework as clear as possible, a more detailed analysis of each element of sustainability and how those elements apply to higher education is needed. Using this three-part taxonomy is productive, but I admit that taxonomies are limited tools; there are inevitable overlaps in categories, blurring of boundaries, and seemingly capricious choices about what belongs in which category. But for purposes of analysis, taxonomies are helpful and can provide insights that looking at something in its entirety cannot.

Leg 1: The Economic

Beginning my analysis of a sustainable university program with the economic piece of the triad doesn't indicate any hierarchical value. The three-legged stool metaphor demands that no one element be placed above or below the other. The economic leg, however, might seem a bit easier to analyze because it is largely based on quantification. In sustainability jargon, "economic viability" is commonly used to describe this leg. In other words, for any element in an environment to be economically viable, the quantified costs and benefits must result in a system that has the capacity to be profitable and survive. Even though universities are not typically for-profit institutions, economic viability is still a powerful consideration in decisions about degree programs. To be economically viable, a program has to have enough administrative, faculty, and student support to be cost effective for the university. New programs must prove that there is economic need for graduates in the program area. With a program like DTC, technology is an important, but sometimes glossed-over economic element. For instance, even though sufficient technology might be in place at the beginning of a project, replacing and upgrading technology is too often given little attention, causing economic sustainability problems as the program grows.

The idea of growth is integral to the concept of economic sustainability (especially the idea of sustainable development). Growth is typically measured though a benchmarking process. According to sustainable community management expert Douglas Porter (1997), "benchmarks establish broad goals and objectives" and can also create "numerical targets that will allow measurement of progress toward achieving those goals" (p. 279). When growth is a central focus, the concept of sustainability becomes more complicated. In the case of a university degree program, pressures to "grow" a major may result in an increase in the number of students enrolled in the degree and a resulting shortage of instructors, room space, technology access, or administrative services for those majors.

Leg 2: The Ecologic

In most sustainability analyses, the natural ecosystem is the ecology considered. For this chapter, however, the university will be considered in terms of an ecology of knowledges. Knowledge ecology advocates argue that "knowledge exists in ecosystems, in which information, ideas, and inspiration cross-fertilize and feed one another" (Por & Spivak, 2000, online). A more complex conception of the university as a knowledge ecology is offered by Catherine Odora Hoppers (2006), who posited that the university is a "fomalised ecology of knowledge" that results in tensions between stakeholders due to a range of institutional factors (pp. 56–57).

In this chapter, the ecology of knowledges leans heavily on the concepts of interdisciplinarity. Interdisciplinarity pushes against the polarities of disciplinarity and the privileging of one form of knowing over another. Interdisciplinary scholar Lisa Lattuca (2001) argued that disciplinarity provides “the rationale for the departmental structure of U.S. colleges and universities and strongly influences faculty appointments; hiring, promotion, and tenure practices; teaching assignments; student recruitment and enrollment; and even accounting practices” (p. 1). This claim is common knowledge to those on the inside of the university bureaucracy. Defining *interdisciplinarity* as “the interaction of different disciplines” (p. 78) ties it closely to the concept of knowledge ecology and allows for analysis based on a goal of moving the university toward an interdisciplinary knowledge ecology.

Leg 3: The Social

In most considerations of the social leg of the sustainability stool, the terminology used is “socially just.” In a socially just society, all people and groups would have the same basic rights, security, opportunities, obligations, and social benefits. In this chapter, the concept of a socially just university is founded on the ideals of a socially just society—one in which individuals and groups are given fair treatment and a just share of the benefits of society. It follows that the goals of a socially just university are to provide access to a diverse student population, to provide that students of all types have the opportunity to succeed within the university, and to equip students with the background and knowledge to succeed outside of the university.

HISTORY OF DTC AT WSU-V

A brief history of Washington State University and the Digital Technology and Culture (DTC) degree will help to contextualize this chapter as well as provide for a sustainability analysis of the degree from its inception. The degree was conceived at Washington University’s Vancouver (WSU-V) campus, which is one of three WSU branch campuses established in 1989 to serve growing education needs across the state.[2] These campuses offered upper-division courses leading to BA and BS degrees. Founded almost 100 years before the branch campuses, WSU’s main campus in Pullman was established in 1890 as the state’s land-grant institution. Pullman, on the eastern border of Washington, is about 350 miles from DTC’s birthplace at WSU-V.

DTC at WSU-V: The Economic

Seeking to expand its enrollment in the early 1990s, WSU-V began general studies interdisciplinary degrees in social science and humanities. In the mid-1990s, Tim Hunt, a faculty member and administrator in the early days of WSU-V, was acutely aware of the need to increase enrollment beyond what the interdisciplinary degrees could provide and also to better serve the needs of the Portland/Vancouver metropolitan area.[3] Hunt proposed a

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[2] The other branch campuses were established at Tri-Cities and Spokane. In Fall 2006, Vancouver admitted 157 first-year students—its first freshman class. Tri-Cities will enroll first-year students in Fall 2007. Fall 2006 enrollment on the Pullman campus is 18,432; Vancouver 2,329; Tri-Cities 1,076; Spokane 1,580.

[3] Information about the history of the program at WSU-V was provided by Tim Hunt, now chair of the English Department at Illinois State University. Hunt was at WSU-V from 1990 to 2003.

Language, Culture, and Cognition option in the general studies program that would meet the regional and national need for more broadly educated graduates in technology and multimedia areas. The initial proposals for the option carefully laid out the economic particulars and included numerical data from national surveys as well as Oregon[4] and Washington economic development statistics. In addition, Hunt demonstrated that the program could be instituted with current WSU-V faculty, thus insuring that the initial costs of the program to the university would be small. In these initial documents, the technology and classroom infrastructure was characterized as "already in place."

DTC at WSU-V: The Interdisciplinary Knowledge Ecology

Hunt's proposal laid out the interdisciplinary knowledge ecology facets of the proposed general studies option, outlining it as a multi-disciplinary program in which students would:

a) explore the interaction of language, technology, and society (including the history and impact of earlier technologies of language, such as writing and print) to develop a critical understanding of these new practices;

b) develop expertise in computer-based multimedia authoring; and

c) learn both how to conduct research electronically using such resources as computer databases and the Internet and how to manage, assess, and synthesize the results of their research.

Courses in the option would be drawn from anthropology, communications, computer science, English, graphic design, history, political science, psychology, rhetoric, and sociology.

Hunt's early memos explained that "cultures experience profound reorganizations when their modes of transmitting and storing language change," and predicted that "the emergence of electronic media and computing… will likely turn out to have been the most fundamental reconfiguration or our means of learning, enacting, transmitting, and storing language since the massification of print (perhaps since the emergence of writing)." Because of this fundamental change, Hunt believed that the university should prepare students who understand how language, culture, and cognition interact and who would be positioned to contribute to education, government, business, and communication industries, and various other areas. Students coming from an interdisciplinary program, Hunt claimed, would "be able to contribute new and productive models to the institutions that employ them."

Certainly, the original Language, Culture, and Cognition option that Hunt proposed fits Lattuca's (1991) basic definition of interdisciplinarity as "the interaction of different disciplines" (p. 78). In addition, the option works well when considered as a knowledge ecology in which "knowledge exists in ecosystems, in which information, ideas, and inspiration cross-fertilize and feed one another" (Por & Spivak, online). The tenets of an interdisciplinary knowledge ecology were not hard to imagine at a campus like WSU-V—a small campus of just a few

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He provided me with memos, proposals, and the opportunity to ask as many questions via email as I wanted. We also talked about the program in a long telephone call during which Hunt provided a more nuanced view of the program than one can glean from the written documents.

[4] WSU-V is located just across the river from Portland, Oregon, and serves a metropolitan population of over 750,000.

hundred students with faculty who often functioned as one-person units.[5] The walls of disciplinarity were low at WSU-V; faculty in disparate disciplines walked the same halls, shared the same coffee rooms, and, by necessity, were committed to the university-wide success of WSU-V. The elements considered by many of those who study interdisciplinary work—shared spaces, time for interdisciplinary research, and communication among those steeped in different disciplinary traditions—were part of the day-to-day realities at WSU-V.

DTC at WSU-V: The Social

The third leg of the sustainability analysis, the socially just university (one that presents access and opportunity to diverse populations and provides students with the opportunity to succeed in the university and beyond) was a consideration at the beginning of the general studies option as well. The history of WSU as a land-grant university lends itself to the goals of a socially just university. According to Martin Jischke, who has served as president of two land-grant universities (Purdue and Iowa State), "the land-grant university is a uniquely American idea, defined by a commitment to the land-grant values of access and opportunity, combining practical and liberal education, conducting basic and applied research, and reaching out to extend the university to serve the people of the state" (cited in Charles, 1997, online). The land-grant university is historically well-positioned to act as an agent for social justice. The founding of WSU-V as a branch campus of a land-grant university was based largely in an effort to provide university access to a largely underserved region of Washington State. Hunt's proposal also addressed this issue, noting that there were hundreds of well-qualified students awaiting the opportunities that this option would provide them—the opportunity to work in the many jobs the degree would qualify graduates for. These students were not traditional college-age students, but non-traditional, returning students from the Portland/Vancouver metropolitan area. The option included a stated goal of providing the work world with graduates whose approach was not narrowly bounded by specific expertise in computer science, business or the like, but graduates who have the analytical, expressive, and organizational abilities that a liberal arts degree can impart, along with a deep awareness of technology's influences on contemporary communication.

DTC BECOMES A STATE-WIDE PROGRAM

The program Hunt proposed was in place by spring of 1997 as a general studies program option in Electronic Communications and Culture (ECC). Shortly thereafter, Hunt and others at WSU state-wide looked to establish a stand-alone degree program in Electronic Media and Culture (EMC) that would be available at the Pullman and Tri-cities campus as well as Vancouver.[6]

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[5] Although faculty at WSU-V have always been considered a part of the larger WSU departmental community and are tenured into WSU units, the distance between the Pullman and Vancouver campuses has made the everyday working conditions of WSU-V quite different from those at the Pullman campus.

[6] This chapter does not include information about the DTC degree at Tri-Cities. The complications of moving the DTC major to that campus were substantially different from those encountered in the move to the Pullman campus.

Economic Considerations of the State-wide Program

The proposal for the major had many of the same economic justifications found in Hunt's original proposal: statistics for the number of jobs were available at the state and national levels; assurances that faculty already in place at all campuses would be able to teach the courses; claims that all campuses were "adequately staffed to launch the program"; and an additional assurance that all campuses had the technology needed to begin the degree program. However, the specifics for how technology needs would be met as the program grew were not addressed. Overall, these particular economic sustainability concerns were glossed by a statement that "the initial cost of the program is minimal, since it primarily provides an additional pattern for utilizing existing (in Pullman) courses or courses that are already budgeted in Vancouver to generate new FTE." Vancouver student enrollment was projected to be 100 students by the fifth year of the degree's existence.

Interdisciplinary Knowledge Ecology Issues and the State-wide Program

By the time the EMC degree was proposed, interdisciplinary knowledge ecology concepts were well articulated. The proposal characterized the degree as including a "multidisciplinary, liberal-arts-based investigation of the epistemological, political, and educational implications of computer-based technologies." This degree would "provide students the opportunity to: 1) investigate computer-based technologies historically and critically; 2) develop the analytical, expressive and organizational capacities that we traditionally associate with liberal arts curricula; and 3) acquire a set of employable skills." Participating disciplines were also articulated more fully; the EMC curriculum would draw upon

> investigations that the development of computing is driving in such areas as language and culture (anthropology, writing, the history and theory of rhetoric, linguistics; cognition and learning) psychology, linguistics, education; language and society (anthropology, sociology, communications, rhetoric, political science); design and visual communications (fine arts); and information science.

Socially Just Considerations of the State-wide Program

In documents written to propose the degree and extend it, the goal of the socially just university to expand access to diverse populations was partially articulated. Because the land-grant mission of the entire WSU system is still strongly evidenced in WSU's tradition and literature, the assumption that the EMC degree would promote socially just goals is not unfounded. Faculty Senate documents characterize WSU as responsive to the demands and needs of its constituencies in today's society. To meet such demands and needs, the university instructs in both the liberal and practical arts "to develop responsible citizens and to provide professional and technical skills needed within the state and in the larger society." In a specific nod toward the university's responsibilities for promoting social justice, WSU's goals include broadening "the intellectual scope of its students by fostering an understanding and appreciation of diverse cultures and sociopolitical systems both domestically and internationally. The university environment promotes intellectual curiosity, integrity, a high sense of responsibility, and moral values" (WSU Faculty Senate, 2006, pp. 1–2).

ROADBLOCK: THE INTERDISCIPLIANRY KNOWLEDGE ECOLOGY

At this point in the history of the EMC degree program, the economic and social justice elements of the sustainability analysis temporarily fade into the background. Most of the roadblocks that advocates for the degree encountered in their quest for sustainable program development were the high disciplinary walls of a 100-year-old university. In most cases, those disciplinary walls were in the form of departmental structures. According to Lattuca (1991), higher education history in the U.S. has "been one of increasing disciplinary specialization and organization" (p. 6), with the first academic departments established in the 1820s. The Morrill Act in 1862 led to the development of land-grant universities that provided "access to specialized training in professions such as nursing, education, and engineering" (p. 6). WSU, a relative late-comer the university world, was founded as a utilitarian, land-grant university in 1890. The fledging university established five colleges: Agriculture, Mechanical Arts and Engineering, Science and Arts, Veterinary, and Home Economics; and four schools: Mines, Education, Pharmacy, and Music and Applied Design. In addition to these divisions, many of the colleges and schools were sub-divided into departments (Von Bargen, 2002, online). The creation of colleges, schools, and departments called for administrators to lead those units and to serve as guardians of disciplinary turf.

Because of these often well-defended turfs, the EMC degree proposal hit snags almost immediately—many of them administrative. Administrators at both campuses were reluctant, and some would not even consider the possibilities of the degree.[7] One exception to this general reluctance was a forward-looking dean who did give the proposal the green light; unfortunately, he left before the degree could go forward. His replacement did not favor the degree. When it was first put forth, one administrator on the WSU-V campus called the degree "fluff" and was not willing to waste any "political capital" on it. Another at WSU in Pullman said it was "not worth doing." Not willing to admit defeat, Hunt and others at WSU-V asked if the EMC degree could be put forward as a Vancouver degree only. Administrators deemed that move impossible because academic offerings at all campuses had to be identical.

Despite the reluctance and roadblocks, the general studies option in Electronic Communications and Culture at WSU-V was growing. Students were graduating with the degree option and finding many open doors. This success, coupled with enrollment and administrative changes, led to less opposition. By 2002–2003, a proposal for a full degree program was once again being considered. Even though departmental structures at WSU-V were less defined and rigid than those in Pullman, if the degree was to be offered state-wide, it needed to have a departmental home. Some of those already teaching in the WSU-V Option were tenured in the English department (including Hunt) and the English chair was willing to take on the degree, so the WSU English Department became "home" for EMC.

The home of the degree decided, it then became the responsibility of the English Department to guide the degree through several bureaucratic hoops. That process was relatively smooth until spring of 2003, just days before the degree was to be voted upon by the Faculty Senate. At that juncture, the difficulties that the degree would face on the Pullman campus started to become clear as disciplinarity and departmental boundaries came into play. The Communications School[8] let it be known that they considered the term "media" in the degree

[7] Information in this section is from my phone interview with Hunt. Names of administrators who hindered the program's development are not integral to this chapter and are therefore not included.

[8] The Communications School at WSU is housed entirely at the Pullman campus. It is the largest department in the College of Liberal Arts (about 700 students), does not offer courses

name, Electronic Media and Culture, to encroach on their territory. Because of that term's inclusion in the degree name, they announced their intent to vote against the degree. Because of their strength in the College of Liberal Arts, this negative vote would be a death knell for the degree program proposal. Although some promoting the degree wanted to stand fast and argue for the name Electronic Media and Culture, those with more political savvy realized that any dispute would set the degree process back at least a year, and quite possibly more. At the very last moment, the degree proposal was amended and the degree was put forth as Digital Technology and Culture (DTC).

DTC'S STATE-WIDE SUSTAINABILITY

As I mentioned in the introduction, I arrived at WSU in fall of 2003 and part of my job description was to "grow the DTC degree." Although I was just learning about the degree, I was eager to help the handful of students who were ready to complete the program. We immediately ran up against problems that had not been considerations when the degree was at WSU-V. In Pullman, where disciplines, departments, and degree programs had been in place for over 100 years, the situation was much different. At the Pullman campus, there are over 750 faculty in 10 colleges, some of which have been in place since WSU's founding. In the College of Liberal Arts alone, there are 18 departments offering 31 different majors. Disciplinary walls are well-established and run both high and deep.

The first encounter with disciplinarity involved the Fine Arts (FA) department. Because WSU-V had only upper-division classes, the issue of prerequisites was a non-issue—none were required. In addition, WSU-V had a one-person FA faculty, and not a single FA major. WSU-V DTC majors had no problem getting into FA classes, as there was no competition for seats in the courses. But the FA situation in Pullman is markedly different. Pullman has a full-fledged Fine Arts department offering several degrees including a BFA and an MFA. A full slate of foundational arts courses is available at the lower division, and prerequisites are typically enforced. To take some required DTC courses, students might need to take two or three prerequisite courses. At the beginning of the DTC program, a few majors slipped through the prerequisite requirements and took upper-division FA courses. They were not prepared, lagged behind those who had taken the prerequisites, and created pacing problems for teachers. Not surprisingly, FA faculty who were teaching the courses were unhappy, and DTC majors were equally unhappy. They were promised a degree that could be completed in 2 years, but found that on the Pullman campus, that promise was difficult to keep. FA courses were not the only ones in the Vancouver-designed major that had prerequisites on the Pullman campus. Not only did students run into prerequisites, but they also encountered faculty in several departments who had never heard of the DTC major and were unaware that their courses were part of an interdisciplinary major housed outside their home departments and sometimes even outside of their colleges.

Because I had been on the job only a few weeks, I knew very little about the institution, about the degree, or about how to approach these disciplinary issues. One thing was certain, however, these issues needed attention. To sort out the FA prerequisite issue, a meeting with the chairs of the English and Fine Arts departments and three FA faculty was arranged. Luckily, the FA chair and faculty knew about the DTC major and were willing to compromise. After two or three meetings and numerous emails, reduced prerequisites were set for DTC majors—enough so that the FA faculty believed DTC majors could successfully take the classes without the full slate of prerequisites that FA majors were required to take.

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at the branch campuses, and is named after the department's most famous graduate, Edward R. Murrow.

Negotiations on prerequisites with other departments have been slower than those with the FA department. Some department chairs have been reluctant to even discuss the DTC major and their department's possible role in it. In spring of 2007, conversations with one department offering courses included in DTC—but were nearly impossible for DTC majors to enroll in—concluded successfully.

Despite these difficulties, conversations with individual faculty members in various departments are often collegial and less concerned with disciplinary boundaries than my first experiences led me to believe they would be. Many have voiced support of DTC's interdisciplinary approach and an interest in helping the major succeed. Their interest is dampened by the realities of departmental structures and their need to heed the demands of disciplinary boundaries. Lattuca (1991) noted that disciplines are "more than canisters of subject matter and inquiry methods," and posited that "the value judgments made by individuals within a discipline concerning the appropriate topics for investigation, the kinds of questions that are valid to ask, and judgments regarding what constitutes a valid answer are social conventions, and these conventions lead to different views of scholarship" (p. 34). In addition to different views on scholarship, the disciplines provide faculty with an identity—an identity into which faculty have been well-socialized by the time they reach tenure-track positions. Lattuca claimed that, in addition to being technically competent, an individual must "show that she or he is loyal to the collegial group and will adhere to its norms" (p. 36). Because of the need to evidence these allegiances, participation in an interdisciplinary major like DTC can be a questionable career move—especially for pre-tenure faculty.

Even though there have been some complications, students are drawn to the major—often because of its interdisciplinary nature. Countless times, I've heard a student's sigh of relief when I finish explaining the major. This sigh is often accompanied by a statement like "this is what I've been looking for." The narrow disciplinarity of many fields seems constraining to these students, and DTC's broad, interdisciplinary approach is a breath of fresh air.[9] Ironically, DTC students end up with an interdisciplinary mindset even though the faculty teaching them might not share that mindset. For undergraduate students, developing an interdisciplinary sensibility is often easier than it is for faculty. In the core of the major, students encounter teachers with backgrounds in fine arts, literature, rhetoric, computer science, anthropology, library science, and sociology. At the least, students experience interdisciplinarity as "the interaction of different disciplines" (Lattuca, 1991, p. 78). Because students have not been fully initiated into disciplinary ranks, they often can weave ideas and approaches from their coursework into an interdisciplinary tapestry.

DTC IN PULLMAN: ECONOMIC AND SOCIAL JUSTICE ISSUES

Although the economic and social justice elements of this analysis have been in the background for a few pages now, these elements are still vital considerations. There are now nearly 100 DTC majors in Pullman and those numbers are growing. Growth is an important element of the economic sustainability analysis, and with increased numbers, the need for growth in facilities and faculty has become an issue. The English and Fine Arts departments are most heavily impacted by DTC's growth. Although both departments have computer labs, both are experiencing difficulties with growing numbers of DTC students who need access to sophisticated computers and software. When the degree was proposed and accepted, there was adequate technology in place. Because the proposals did not include plans to update or

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[9] In the interest of full disclosure, I must also admit that I have had a few inquiries into the major from students who, after hearing about it, just can't understand it and have no interest in a degree that isn't in a recognizable field of study.

expand technology access once the number of students increased, DTC faculty in these departments are now faced with the challenges of technology expansion. How these challenges will be met is, at present, an open question—a question complicated by disciplinarity and departmentalism. Although DTC students may need more and better technology, will funds and space come from the English department (where the degree is administratively housed) or will the costs of technology expansion be shared? If the costs are shared, will the DTC major headcount be shared between the departments who share the cost?

In addition to the need for more technology access, the need for new faculty is pressing. As research into interdisciplinary programs has shown, many "interdisciplinary programs borrow their faculty from discipline-based departments; a half- of full-time director is responsible for finding suitable individuals to teach program courses" (Lattuca, 1991, p. 48). I was hired to fulfill several roles in the English department, and my load is split between DTC, rhetoric and composition, technical and professional writing, advising, and administration. Up until fall of 2006, I was the lone DTC advisor, with over 70 advisees. A new hire in fall of 2006 has expertise in DTC, but also has advising duties along with teaching responsibilities in rhetoric and composition, and technical and professional writing. In Fine Arts, the situation is similar, with one faculty member who is responsible for the multimedia program and teaching responsibilities that are split between that faculty, one full-time instructor, and a few adjuncts. Neither the English nor the Fine Arts department is eager to give up hard-won faculty lines to a program that does not seem central to its core. Although it may have made sense (and in many ways, still makes sense) to have the DTC major housed in the English department but functioning as a stand-alone major, the economic issues of such an arrangement are difficult.

CONSIDERATION OF THE THREE LEGS: CONFLATION AND ONGOING CONCERN

In spring of 2007, two legs of sustainability conflated, thus illustrating the limits of this taxonomy.[10] The economic and interdisciplinary knowledge ecology leg were both in play when faculty in English/DTC and the multimedia area of Fine Arts initiated consideration of an interdisciplinary position to be shared by the Fine Arts and English departments. This position was initially supported by both department chairs. Upon further discussions between the chairs, the complexities of the disciplinary bureaucracy (which included issues of money, space, teaching load, administration, tenuring, and others) became too difficult to overcome. The position was removed from consideration even though faculty still strongly supported it. Spring of 2007 brought even more complications for DTC, when the two main multimedia FA teachers took positions at different institutions. Resolution of issues that directly impact the DTC degree are difficult to negotiate because of well-established department boundaries and DTC's awkward position as an interdisciplinary program in a university world ruled by the traditions and limitations of disciplinarity.

The social justice leg of DTC in Pullman is an ongoing concern of the degree. DTC graduates have been easily placed in jobs showing decent returns on their investment in a university degree. Several have been accepted into graduate school. The work-world and graduate schools welcome DTC's technology-savvy and culturally aware graduates. Besides job-placement, another substantial issue for any technology-based program is the digital divide—a divide sometimes trivialized by framing it only as an issue of access. But it is a much more complicated divide that encompasses not only access, but literacy, culture, content, pedagogy, and community (Carvin, 2000). To make the DTC program sustainable in the social

[10] Even though this conflation may be seen as a fault, articulating a three-part taxonomy and then seeing how the parts of that taxonomy blend is, in this author's opinion, also helpful.

justice sense, work has been done to assure that graduates are fully aware of all aspects of the digital divide. A course in digital diversity has been added to the core requirements and students have the opportunity to do internships for WSU's Center to Bridge the Digital Divide. To make sure that the degree program itself does not become as andro- and euro-centric as much of the digital world is, efforts are being made to keep enrollments in the major diverse. In spring of 2006, 43.5% of Pullman DTC graduates were women. The total WSU female population is typically around 47%, making DTC female graduates close to the overall WSU population. In spring of 2007, however, 61% of the DTC majors are male, 39% female. So that the major more closely reflects the overall WSU population mix (53% male, 47% female), DTC may have to actively recruit female majors. To assure multicultural diversity, the DTC program may also have to recruit more minority majors. In spring of 2006, 8.7% of Pullman DTC graduates were minority students. At present, 11% of DTC majors are minority students, but 14.2% of the University is composed of minority students. To keep the DTC program headed in a socially just direction, attention to these factors must continue.

CONCLUSION

Although my analysis has been site-specific, I hope that I have accomplished at least part of my initial goal: bringing readers to understand some of the sustainability issues involved in establishing a technology-intensive interdisciplinary major at a university with well-defined disciplinary boundaries. These issues are not just local ones to WSU; interdisciplinary work has been taking place since at least the 1970s, but still exists on the fringes and between boundaries in most universities. Many universities are, however, promoting interdisciplinarity as the wave of the future. A 2006 WSU study strongly supported interdisciplinary work, noting that several recent policy reports "have emphasized that new frontiers in scholarly work require individuals with knowledge that cuts across narrow disciplinary boundaries and who have the ability to work in interdisciplinary teams." The same report acknowledges the difficulties of such work in university environments "bounded by infrastructures and organizations that create rigid walls between departments and schools that serve to promote turf battles and make it difficult to advance interdisciplinarity" (Report, pp. 7–8).

Based on these cautions and my own experience, my first recommendation to anyone stepping into an interdisciplinary program or considering instituting one is to read the scholarship on interdisciplinarity. In this chapter I have used the work of Lisa Lattuca (1991), one of the foremost scholars currently studying interdisciplinarity. There is much more excellent work available on the subject, and reading as much of it as possible is important for anyone jumping into the interdisciplinary fray.

My second recommendation has to do with the framework supplied by the three-legged stool approach to sustainability. It has been surprisingly helpful. When I began this chapter, I had a suspicion that this analytical framework might be a stretch. Instead, I found the three-part framework incredibly productive. The research required to complete the analysis led me to a much deeper understanding of interdisciplinarity and the DTC program itself. Before completing this chapter, I was fully aware of the difficulties that the knowledge ecology had presented, but I was less aware of the economic and social justice elements. Although the most difficult component of sustainability in the first 3 years of the major has been the interdisciplinary knowledge ecology element, the economic element is likely to become more challenging in the near future. Work to keep the degree as socially just as possible will require vigilance. The challenge of keeping the three-legged stool balanced requires that all three legs be considered—all the time. This sustainability framework is one I will keep as a guiding analytical and assessment tool for the program because I'm convinced that this framework will help me be a better administrator and assure that the DTC major is sustainable.

My third recommendation grows out of the second one. To complete this chapter, I had to learn more about the DTC major—about its genesis and its history. This recommendation thus is largely informed by Bruno Latour's (1996) actor network theory and its dictum, "follow the actors." Latour considers all parts of a project's history "actors," so people and documents are considered equally. I tracked down the people involved at the beginning of the major to find out what their motivations and visions for the major were. As I talked to those instrumental in creating the major and those who helped make it a state-wide degree, I found (not surprisingly) that their accounts varied. Each saw the establishment of the degree through different eyes and from different viewpoints. Weaving these accounts together to form my own understanding of the degree has been instructive. In addition to the oral accounts of the degree's history, gaining access to its founding documents was incredibly helpful. I was well into my fourth year of coordinating the major, but I had never seen these documents and had only a partial understanding of why and how the degree came about. Now I have my own narrative of the degree program, one more nuanced than before. While writing this chapter, I have muttered over and over, "If I'd only known this a couple years ago. . ." So my third recommendation to anyone stepping into a new program—of any kind—is to find out as much as possible about the history of the program. That means gaining access to all historical documents and contacting as many people involved with the program as possible. In my case, I had no idea that the documents that inform this chapter even existed before following the people-trail back to the beginning of the DTC degree.

Not surprisingly, my final recommendation grows out of the previous one. It can be summed up in one word: **network**. Although encouraging people to network might seem like trite advice, when considering a sustainability framework and working in an interdisciplinary program, networking is required. The university is an essentially anthropocentric entity—it works almost exclusively through human interaction, primarily for the betterment of humans. In such an institution, social networking is advisable. When working in an interdisciplinary program and hoping to sustain that program, networking is indispensable.

Although establishing the DTC major on the Pullman campus has not been without challenges, mid-way through 2007 it was thriving. There are over 100 DTC majors; when I talk about the degree, I'm not met with as many blank or quizzical looks. More and more frequently I hear something like "oh, I've heard about that degree; tell me more about it." Students, not typically steeped in the traditions of the university, are usually the first to "get it." Faculty, who often know first-hand the rich returns of interdisciplinary work, are likely to understand the degree; some are equally quick to recognize its perils. Administrators have much the same understanding as faculty, but they often have deeper reservations about an interdisciplinary degree, because they serve as the guardians and gate-keepers for their departments and disciplines.

For any program to be sustainable, those in charge must believe in the program and its possibilities. But, important as belief is, those leading the program must also have some theoretical and practical tools for analyzing and assessing it. The economic, ecological, and social focus of the three-legged sustainability framework provides powerful analytical and assessment tools.

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CHAPTER	8
TITLE	The Hybrid Academy: Building and Sustaining a Technological Culture of Use
AUTHORS	Beth L. Brunk-Chavez Shawn J. Miller
OVERVIEW	When the first-year composition program at the University of Texas at El Paso agreed to offer hybrid sections of composition, we had no organized structure in place to support the training, development, and delivery of these courses. Yet we were fully aware that more was required than teaching instructors how to use course-management systems. We didn't want the hybrid courses to be a one-time, unsustainable, potentially frustrating experience for instructors, students, and administrators. We also didn't want composition to be the only program to offer hybrid courses. To alleviate this situation, the Hybrid Academy was collaboratively formed. More than just a series of workshops, the Hybrid Academy was designed to help composition faculty—many of whom were at least somewhat familiar with teaching with technology but brand new to the idea of alternative delivery of courses—conceive, create, develop, and deploy fully functional hybrid courses. The Academy model has grown, at our institution, beyond composition, in part due to the fact that it does not follow the one-size-fits-all approach of the generic technology workshop. Rather, each academy is designed and run for individual disciplines. Through this situated design, we were able to affect technological and pedagogical change beyond the individual instructor and the isolated classroom, and rather to affect change that fostered and sustains a technological "culture of use" on our campus.
TAGS	Beth Brunk-Chavez, course redesign, culture of use, ecology, faculty development, faculty training, feedback loops, feedback, hybrid academy, hybrid, pedagogy, peer evaluation, portability, Shawn Miller, student*, sustain*, technolog*, University of Texas at El Paso, UTEP
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The Hybrid Academy: Building and Sustaining a Technological Culture of Use

Beth L. Brunk-Chavez
Shawn J. Miller

Despite initial appearances, this chapter won't be about persuading individual faculty to accept and learn how to use technology in their courses. We[1] won't discuss new ways to present technological tools to faculty—to help them try to "fix" their courses, or to update them into something more dazzling or (post) modern. However, at the center of this chapter, we do indeed intend to discuss our experiences with technology training for faculty. The focus of our discussion will be something we call the Hybrid Academy—a locally developed, faculty-centered, intensive series of workshops designed to help participants recognize and value the intersections between technology and pedagogy and learn how to employ both more effectively in their courses. What makes this program unique is that it does not follow the one-size-fits-all approach of the generic technology workshop. Rather, each academy is designed and run for individual disciplines (and sometimes for core groups of interdisciplinary instructors and faculty with strong, common pedagogical goals). Through this situated design, we are able to affect technological and pedagogical change beyond the individual instructor and the isolated classroom into what we call a "culture of use."

Technorhetoricians rarely need to be encouraged to teach with new technologies or to be convinced of technology's pedagogical benefits. However, if we want to encourage and convince hesitant teachers to use technology in their classes, the conversation has to start at a pedagogical level. The Hybrid Academy's purpose, therefore, is to affect widespread change through a re-vision of pedagogical priorities, assumptions, and methods. As a result, the Academy interrogates the notions of "advanced technological training" and "cutting-edge technologies." A cutting-edge mentality, while useful and necessary for a transitional period of time, has on the whole failed to drive the massive shift needed to affect a sustainable technological culture of use in our classes and on our campuses. This chapter will discuss the conditions that led to the technology push on our campus, as well as the development and implementation of the Hybrid Academy for the first-year composition program, which eventually spread across campus. The Hybrid Academy model—our version of carefully planned faculty training—is, we believe, a proven and portable model that can initiate a sustainable culture of use at other institutions and on other campuses.

HOW COMPOSITION HELPED CREATE THE HYBRID ACADEMY

As may be the case at many colleges and universities, in late 2003, first-year composition at the University of Texas at El Paso (UTEP) found itself at the front end of the technology-marries-pedagogy-push at our campus. Courseware management systems such as WebCT and Blackboard had matured to the point that a general acceptance of such tools as university mainstays was imminent. With all-time high annual enrollments intensifying the problem of

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[1] The "we" here is what we consider the best of both worlds in terms of faculty development and programmatic change. As a faculty member in Rhetoric and Writing Studies at UTEP, Beth brings her disciplinary background and pedagogical experience. As an Academic Technology Consultant at Duke University, Shawn brings technology knowledge and faculty training experience.

available classroom space, alongside our tradition of serving a largely non-traditional student population,[2] our administration began considering—and eventually understood the necessity of—alternative course-delivery methods. These considerations included the discussion of typical components: compressed semesters, mini-mesters, distance courses, and hybrid courses.

As a solution, therefore, for both saving classroom space and moving more of UTEP's courses into a digital environment, a group of instructional technologists approached the composition program to be the first organized—that is, institutionalized—discipline to hybridize courses. Composition was chosen as the first discipline on our campus to deliver courses as hybrids for several reasons. The most significant administrative reason was the large number of composition sections delivered each semester; moving toward a hybrid-delivery model would create a substantial impact on available classroom space. Although there has been some debate as to what a true "hybrid" course is, at UTEP, hybrid courses are those in which students meet one day a week face-to-face (F2F) and spend the rest of their "seat time" online.[3] Because our hybrids are true 50/50 splits every week of the semester, this model allows us to offer more sections of composition simultaneously. For instance, rather than scheduling six separate classrooms at 10:30AM on Tuesday and Thursday, those same six sections can be offered using just three classrooms, with three instructors meeting their class F2F on Tuesday and the other three meeting their class F2F on Thursday. Therefore, unlike other disciplines where there are one or two sections of the same course, thus requiring minimal classroom space, composition could easily free up ten classroom spaces in the first semester of the pilot. Because most of these classes were already taught in a cluster of computer classrooms, two instructors could be scheduled in the same computer classroom at the same time.[4] Finally, and most significant to us, as composition courses maintained a reputation for being at the forefront of technology use in teaching (generally requesting more

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[2] UTEP is located on the U.S.–Mexico border and has a student population that is over 72% Hispanic. We educate many first-generation and English-as-a-second-language students. With over 19,000 students enrolled in 2005, 69% attended full-time, and the average age of the undergraduate student was 24. The majority of students commute, work part- or full-time, and raise families while attending UTEP. While designing the hybrid academy, we often faced the criticism that this particular population of students would not succeed in a hybrid format for a variety of reasons. We found the contrary, in most cases, to be true. Because of these characteristics, we felt even more responsibility toward assisting these students in becoming more technologically literate.

[3] To be more specific, instructors will divide the coursework between F2F activities and online activities. In a composition course, for example, an assignment might be introduced and discussed in class. Online, students will continue the discussion by participating in small discussion groups to generate ideas, and then post and critique drafts. When they return to class, the instructor can discuss important strategies such as judging the credibility of sources and incorporating them into their projects. Students might then work together online to analyze a series of Web resources and choose ones appropriate to their projects, and so on. In any case, instructors are taught to make effective connections between what is done in class and what is done online so that there is continuity in the course.

[4] One administrator we didn't account for in the beginning is the registrar, who had other thoughts about scheduling two classes in the same room at the same time. Until they were able to reprogram their system, one or both of the courses would automatically be kicked out. They were also unable, for some time, to mark these sections as hybrid in the schedule, and students would enroll without prior knowledge that the course was alternatively delivered.

technology and technology-enabled spaces than other disciplines), university administration determined composition to be an ideal candidate for testing a move to hybrid courses.

As is characteristic of most composition programs, a large number of instructors consistently teach first-year writing and teach multiple sections of the same course concurrently. This enabled the training of a relatively small number of faculty for a relatively large impact on the numbers of sections taught within each semester and over time. Numbers were also an important consideration regarding the students in each section. Because of composition's "low" cap of 25 students per section (rather than, for example, the 125 that enroll in a typical UTEP history survey course), instructional technologists believed that instructors new to teaching with technology would be able to effectively manage their students online–allowing technologists time to provide enough individual attention for faculty to grow confident in the hybrid process and their information technology literacies. Along with one-on-one support in developing sustainable hybrid-delivery approaches, as an added incentive to teaching the first hybrids, Academy directors negotiated to reduce the number of students in the initial hybrid course offerings to 18.[5]

A final reason for launching composition courses as hybrid—and perhaps the most important reason to the discipline of composition—is its process-oriented pedagogy, its emphasis on collaboration, and the kind of learning students generally do in first-year writing; these aspects coincided with current scholarship on teaching online.[6] This, along with the fact that the collective attitudes toward trying new technologies and new pedagogical approaches were for the most part positive (which is a trait of many composition programs disciplinarily), persuaded the composition program to be the first at UTEP to create and teach hybrid courses, and our Composition Committee agreed to pilot a hybrid program for the second-semester composition course.[7] Eight well-respected instructors were invited to create at least one, and up to three, hybrid courses for the first semester of the pilot. They also retained the option of teaching some of their courses entirely F2F.

However, persuading instructors in the composition program to agree to this step was just the beginning of a relatively long process. Without an organized structure in place to support the training, development, and delivery of these courses, but fully aware that "faculty development involves more than familiarizing teachers with their software options" (Fleckenstein, 2005, p. 170), the Hybrid Academy was collaboratively formed. More than just a series of workshops, the Hybrid Academy was designed to help composition faculty—many of whom were at least

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[5] The reduction of course size was a temporary measure, as part of a larger set of "incentives" provided by administration to entice faculty into participating in hybrid courses and course development.

[6] See, for example, Beth Hewett and Christa Ehmann (2004), specifically their discussion on "OWI and its epistemological roots in social constructivism" (p. 33). In an interesting discussion concerning the ways in which distance education can either move writing pedagogies forward or backward, DePew, Fishman, Romberger, and Ruetenik (2006) stated that distance education "pioneers saw significant value in the dialogic and epistemic properties of writing and utilized those properties when defending [distance education] techniques" (p. 57).

[7] A primary reason cited for the decision to pilot hybrids in the second-semester course was student maturity. The committee was reluctant to pilot hybrid courses in the first-semester course largely because of the F2F time first-semester students might need or desire. This attitude is currently shifting, however, and hybrids may be used in the first-year course in the near future.

somewhat familiar with teaching with technology but new to the idea of alternative delivery of courses—conceive, create, develop, and deploy fully functional hybrid courses.

Although initiated through the hybridization of composition courses specifically, from its inception, the Hybrid Academy was a collaborative entity housed within UTEP's Instructional Support Services (our instructional technology center). Following James Surowiecki's (2004) concept of the wisdom of crowds, there needed to be several parties involved in the development of the Academy, the training of the faculty, the overall implementation, and the ongoing and final assessments of the courses. Surowiecki found four characteristics that make a crowd wiser than an individual: *diversity* (group members come to the project with their own areas of knowledge or expertise), *independence* (each person's opinions are formed apart from those also in the group), *decentralization* (group members are able to draw on individual, local knowledge rather than one person dictating the group's direction), and *aggregation* (the group must have a way of creating one decision, plan, or opinion; p. 10). Within UTEP, the Academy leaders—comprised of composition faculty, the director of UTEP's teaching and learning center, administrators, and instructional technology experts—offered a diverse set of technological and pedagogical experiences, training and education, and thinking. Because of these diverse backgrounds, the knowledge was decentralized, independently generated, and aggregated to create a plan that could become a sustainable, portable model. This model needed to be one that met the needs of composition instructors and also one that, in the interest of establishing a campus-wide culture of use, could be used by other disciplines and programs interested in hybridizing their courses.

Portability of the Academy model was a significant issue, given that pedagogies vary, sometimes significantly so, across campus. Academy leaders considered the possibility that multi-disciplinary academies run with, for example, participants from business, education, biology, and composition would have some advantages, particularly in terms of diversity; too much diversity, however, would force the pedagogical and technological training into the one-size-fits-all model that we were trying to avoid. To be more specific, multi-disciplinary academies would not create a contextualized space for intensely theoretical, as well as highly practical, discipline-specific conversations. For that reason, discipline-specific Hybrid Academies were created.[8] Academy leaders envisioned that in the discipline-specific Hybrid Academies, individual participants would become a truly collaborative learning group, engaging in conversations that would lead to shared discoveries about the technologies available, as well as shared invention into discipline-specific approaches to teaching with these technologies. Discipline-grounded conversations that move beyond merely training faculty to use technology, coupled with faculty training and collaboration on course design, could become the catalyst for creating a larger culture of use and ultimately lead to a sustainable technological ecology.

The Hybrid Academy's location within Instructional Support Services (ISS), enabled any department or program on campus to participate. ISS exists as an instructional technology center, not as a part of any particular school or discipline, and not under technical administration (i.e., the Information Technology department). Because of this, ISS can function as an advocate for faculty seeking to use technology in their teaching. To date, ISS has facilitated technology adoption for disciplines such as developmental writing, first-year composition, education, business, and other disciplines and units, including the first-year experience initiative at our institution. During summer 2007, instructors from our local

[8] For the purposes of the Hybrid Academy, directors make assumptions about pedagogical cohesiveness. We know, of course, that pedagogies vary across courses and teachers within the same discipline, but directors aim for basic commonalities in order to efficiently facilitate the workshops.

community college, a major feeder school for UTEP, participated in a Hybrid Academy, thus further expanding the culture of use and the potential for sustainability.

Admittedly, many universities and colleges may not have a center that does exactly what ISS does, but they may have one or more individuals or groups who do work along the same lines, or could help in similar ways. Possibilities include:

- those staff or faculty who have teaching experience and work closely with the school's information technology department, but are autonomous for whatever reason;
- directors or associates of teaching and learning centers that take a proactive approach to technology integration into teaching practices;
- emeritus faculty who have grown interested in new and/or experimental kinds of teaching and/or technology;
- part-time instructors who have taught for some time in the unit, and want to expand their work with technology, teaching, and working with other faculty;
- university assessment staff, lab managers with teaching experience, and/or graduate students with strong technology skills; and so on.

We recommend that those interested in a Hybrid Academy model, or in just building a stronger culture of teaching with technology support, might search for these allies across departments and independent centers. Many universities are so large and fragmented that it is possible to locate, if not discover, people whose job descriptions map nicely to coordinating a hybrid training program.

Having described the inception and structure of the Hybrid Academy, we next examine the attitudes and perceptions of instructors toward technology, and then move to discuss the curriculum in more detail.

TURNING FACULTY ON TO THE "ALWAYS-ON" STUDENT

Before we move on, we'd like to address and better define what we mean by a technological "culture of use." We use this phrase to describe the environment in which the ongoing criticism and revision of technological tools and/or concepts moves toward a gradual deeper overall acceptance. Part of achieving this "overall acceptance" is to gain "buy in" not only from faculty, but, of course, from students. An initial approach then, is to locate and assess the gaps between student reality and faculty assumptions. In terms of a technological culture of use, assessing whether or not a separation actually exists between faculty and students is useful. Faculty, as a micro-culture, often seem to assume such a gap exists and many tend to separate students by assuming a generational gap, and labeling students "Net Geners" (Oblinger & Oblinger, 2006), "always-on" students (Harley, 2006; Roberts, 2005), or "digital natives" (Prensky, 2001).[9]

[9] This is not to say that we believe that every student enrolled on our campuses is proficient with, and has sufficient access to, technology. And, even though we see students walking to class with an MP3 player in one hand and a cell phone in another, we know better than to assume that students are experienced with using technology for educational purposes. However, informal surveys administered to students in first-year composition as well as more formal surveys administered by our instructional technology unit have demonstrated that, for

Many faculty face a tough uphill battle in the acceptance and negotiation of the digital shift: those faculty invested in teaching with technology not only have to discover and learn these technologies, but they also need to determine if and how they can be effectively used as teaching tools. Given the ever-changing state of technology, as well as the lack of support many departments and institutions provide for learning new technologies, faculty often face pressure when considering if and how to integrate digital technologies into their cultures of use—especially if they are pre-tenure faculty. As Sibylle Gruber (1999) suggested, budding technorhetoricians “do not want to jeopardize tenure but also do not want to participate in a system that devalues innovative approaches to teaching, scholarship, and service” (p. 46).[10] Thus, any considerations of a sustainable faculty development program for teaching effectively with technology must acknowledge and seek to alleviate the pressures faculty face in adopting and adapting to new technologies.

Diane Harley’s (2007) study found that the primary reason faculty do not incorporate technology into their courses is that the tools they know of “simply do not mesh with [their] pedagogies” (online). Harley continued by noting: “We should not expect faculty, who we can assume know more about teaching their subject than non-specialists, to shoehorn their approaches into a technical developer’s ideas of what is valuable or the correct pedagogical approach” (online). So even if faculty do perceive value in incorporating technology into their pedagogies, the software or course management systems made available to them may not fit their needs (and, as is often the case, seem out of step with the types of technology they already use for their research). Further, faculty may not have the technological know-how to create or manipulate the software so that it can enhance their pedagogies.

Stuart Selber (2004), in his influential work on technological literacy, *Multiliteracies for a Digital Age*, drew upon two models of technology users created by Shoshana Zuboff and Thomas Barker: *computer-mediated* users and *empowered* users. Computer-mediated users find themselves largely at the mercy of technology. They are often confused, lost, or overwhelmed by technology and have a difficult time working to find technological solutions for themselves. Empowered users, however, are able to “integrate computers more productively, and cope reasonably well in dynamic environments…. [They] confront skill demands, collaborate online, and explore instructional opportunities” (p. 46). Although Selber is primarily concerned with the literacy needs of students, in developing the Hybrid Academy we found that we also should consider the technological literacies of faculty who are sometimes inhibited by learning a new technology or are afraid of making mistakes, especially in front of—physically or virtually—students in their classes. Some faculty do not find themselves to be empowered users of technology, and this prevents them from engaging with technologies in meaningful ways.

Several factors, however, can compel faculty to become more empowered users of technology. Culturally, we often talk about the coming of ubiquitous technology and computing, where technology grows to be so prevalent and pervasive that it is less special or unique and more a part of our everyday existence (see Weiser, 1991)—transparent to the point where we don’t register an effort toward using technology. In many aspects of our lives, this is happening or has already happened, of course. Ubiquitous technology can move computer-mediated users from occasional, supplemental use to more integrated, frequent technology use. Knowing and accepting this, we can make a strong case for faculty to apply

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the most part, our students have reliable access to technology and a respectable amount of experience in using it.

[10] For more discussion on the conflict between teaching with technology and tenure, see Selfe (2005), as well as volume 17, issue 1 (2001) of *Computers and Composition*.

their energies to learning about and embracing the use of new technology in their teaching, if not already in their research and home lives as well.

We also want to be careful that we aren't setting up a dichotomy in which the typical student is computer literate, well-versed in a range of applications, and thus empowered, and the typical faculty member is only marginally computer or technologically literate. That's often not the case, despite what some may assume (and it is often the instructional technologists and the faculty who are most guilty of these assumptions). Many faculty are well-equipped and knowledgeable in technological areas—some faculty have grown up with new media and technology in one way or another, or even use new technologies in their research—and there are many students, young and old, who come to college expecting to learn "something about computers" and who are relatively unprepared and unacquainted with recent technological developments.

The Hybrid Academy helps to resolve these gaps, in part by asking teachers to become students in a hybrid learning experience. For a great deal of the time spent in the Academy, instructional designers become instructors, and faculty become students. For faculty who have never taught an online or hybrid course—and for faculty who hold the assumptions that students are "always on" and faculty are "always left behind"—playing the role of a student creates an opportunity for a meta-discussion wherein instructors and instructional designers can step back and unpack, analyze, and reflect on different hybrid experiences. What we want to emphasize, therefore, is that rather than meeting the "net generation" on their collective terms alone, true change and adoption of various technologically enabled approaches can better happen if all parties—students, faculty, and administration—embrace a common set of goals and a desire to reach them.

CREATING A CULTURE OF USE

Outside of academia, we have learned that designing new technology involves more than a cool new gadget and its end user; it also involves a network of people (designers, marketers, developers, etc.), the context of use (the "need"), and the culture (the "want"; van der Veer, 2006). Therefore, before a technology can be launched into the marketplace, designers must understand these networks well enough to establish a fit. If there is no fit, no culture of use will be established, and the technology will ultimately fail. Consider, for example, the mobile phone. For this once-emerging technology to be successful, there needed to be either an existing culture that desired mobility and was waiting for a new technology to enable that activity, or a mobile culture had to be created by producing and marketing a technology that made people want to communicate on the go. Most often, the culture of use is created out of a combination of an established and a created culture. Designers of new technologies consider what the culture of use will look like and in what ways a technology could be implemented—that is, consider their audience and/or potential audience. They consider barriers that might prevent a new culture from taking hold, and also determine if the technology is dependent upon a new culture, or is the re-creation of an existing one. Finally, they consider the distance between the existing culture and the new culture of use. In any case, the end-users, whether existing or new, are both influencers of and influenced by the new technology, which in turn, generates loops that can circulate and feedback indefinitely as developers, designers, and users continue collaborating (both directly and indirectly) and using the technology.

This concept of "culture of use" can also extend to changes and developments in the overall effective pedagogies of an individual faculty member all the way up to an entire university. For example, use of a particular technology can be sustained when that technology becomes so integrated into teaching that it would be impossible to teach without it. This is not just a matter of instructors requiring technological tools to complete assignments, but of reconfiguring the ways they teach and students learn to the point that the technology becomes inseparable from and essential to the teaching and learning goals. For many, the prospect of making one's teaching inseparable from digital technology strikes a chord of fear or even revulsion more than one of hope or progress.[11] As instructors and researchers who have dealt with the many pitfalls of technology (from corrupted files to faulty equipment to accidentally overwritten drafts of this chapter), we can relate. We also, however, find some resonance with Donna Haraway's (1991) concept of the cyborg. Haraway's famous manifesto drew attention for its hopeful positing of the current state of feminism through the lens of the cyborg. A half-human, half-machine person attains quite a bit of freedom in creating a unique, new identity (or even multiple identities). In similar ways, the concept of combining teaching and technology gives us a chance to see both of them in new ways and to shape different identities for the pedagogical practices that emerge.

Similar to Cynthia Selfe and Gail Hawisher's (2004) "dynamic of influence," where they argued that the collective force of parents purchasing educational computer games "generated a cumulative shaping effect on products, product development, and product marketing in the U.S. computing industry" (p. 45), we contend that the wider and more varied the culture of use on a campus, the more potential for growth and sustainability. Understanding that the culture at large is moving toward an increased use of technology for collaboration, communication, document sharing, research, and so on, creates a strong case for academia's embrace of that increase—whether it be through heightened awareness of technology use and technology's impact, or by increased and/or redesigned faculty training. Sustainability depends not only on the success of the early adopters, but also on the strength of the culture of use across campus. The greater the number and diversity of instructors who become proficient at teaching with technology, the greater the number of students who will be enrolled in these kinds of courses, and the demand will continue to grow from both directions. When this increase of use takes hold inside the Academy, the ongoing negotiations among all parties involved continues to expand, creating more opportunities for use and adaptation beyond initial piloting and intensive assessments, and creating more space for open, ongoing collaboration and negotiation to continue.

We refer to these patterns as *feedback loops*. Just as the development and spread of the adoption of mobile phone technologies has grown to the point that we can no longer imagine life without mobile phones, we see rapid and coming changes in the way academics uses and requires technology to support and inform teaching and learning. Sustaining these changes goes beyond merely "institutionalizing" them; once the culture of use reaches what Mark Taylor (2001) would call the "moment of complexity" (p. 5), it continuously grows and changes in ways we might not have predicted, in ways we may or may not like. Figure 1 illustrates our observation of the process that created feedback loops in Hybrid Academy development, with "official channels of communication" illustrated on the left, and more random, complex connections occurring via the lines on the right. It's worth noting that we don't use any arrows to show influence directionality, because no particular group ends up driving the resulting culture of use more or less than another group. In addition, although we've placed groups in an apparent hierarchy, we've done so to illustrate the original, linear conception of our process. The resulting connections that self-generated outside of this plan (the thinner lines) form a new network that eventually will grow stronger than the institutionally created, planned process.

[11] To those intimidated by or unimpressed with technology, we would point out that it has been, of course, always inseparable from teaching, whether it is the technology of the tablet, the feather pen, the blue book, or the chalkboard.

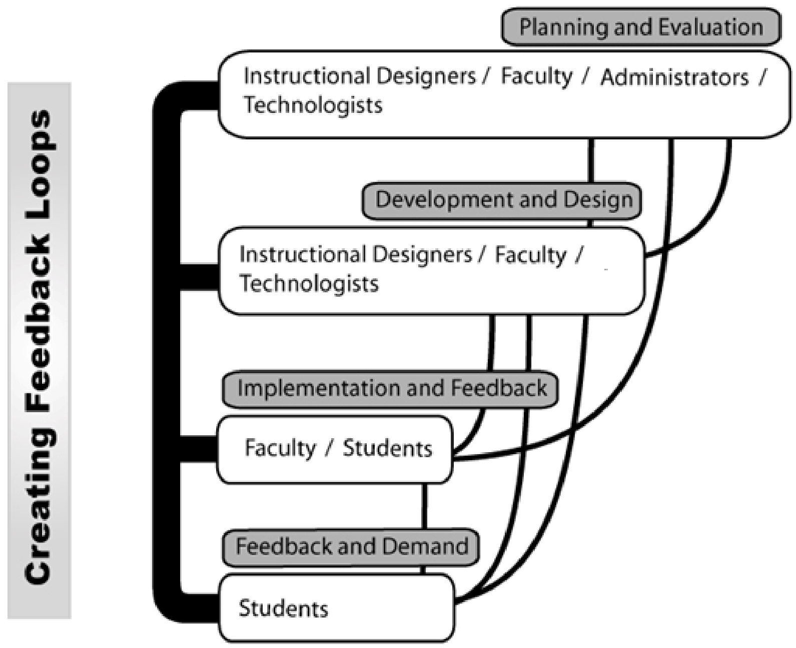

Figure 1. Creating feedback loops.

The remainder of this chapter will discuss the particulars of the Hybrid Academy in more depth. As discussed earlier, this Academy was established as a response to the existing and coming changes to learning and education that the culture outside academia—that of the always-on student in particular—is embracing. In fact, the changes taking place in academics today strongly reflect the changes already taking place in the way people do business, communicate, and socialize.

INTRODUCING INSTRUCTORS TO HYBRID COURSE DESIGN

Establishing a Culture of Use

Although the immediate purpose of the Hybrid Academy is to train instructors to deliver effective hybrid courses, the larger and more significant purpose is to establish and sustain a culture of use across campus. Experienced writing instructors who teach with technology know that it isn't the technology alone that makes for effective teaching and learning. Those of us who hope to establish and sustain a culture of use on our campus must take into account myriad factors beyond individual instructors and classes when developing a training program. For instance, in *Preparing Educators for Online Writing Instruction*, Beth Hewett and Christa Ehmann (2004) stated that instructors "must first identify *pedagogical principles* for training that supersede specific technology platforms and then choose training methods adaptable to particular platforms." The result, they said, "will be a program that is philosophically sound, yet situationally adaptive" (p. 5). Selber (2004) also observed that the massive quantities of online training material "fail[s] to contextualize software applications for students and teachers in departments of English" (p. 5), or more specifically, writing instruction.

An initial concern, then, was maintaining the integrity of composition as a discipline, as well as the local composition program's stated goals and objectives, while at the same time transforming the way instructors conceived of and taught the course as hybrid. For various reasons, many instructors new to teaching with technology have the tendency to base their new, digitized approaches on simple translations from chalkboard to computer screen. However, as David Haily, Keith Grant-Davie, and Christine Hult (2001) argued, students become increasingly frustrated when their instructor assumes that what works for one form of delivery can work for another. Online teachers, they advised, should be prepared to take on the responsibility of fully (re)designing their courses. Academy leaders didn't want instructors to fall into this "shovel-ware" trap and therefore strongly discouraged the practice of loading tried-and-true F2F documents into a course delivery platform, canceling one day of class, and calling it hybrid. We emphasized the dangers of "rely[ing] too heavily on one-way literacy models... [Where instructors] simply transfer wholesale to the screen their existing assumptions, goals, and practices" (Selber, 2004, p. 23) concerning writing, pedagogy, and technology. We needed to equip instructors to meaningfully and productively incorporate technology into their courses and, at the same time, adapt to meeting with students F2F only one day a week. Therefore, the Hybrid Academy encourages a reflection and re-evaluation of the current pedagogical practices of an instructor (or within a given course) before choosing and introducing technologies.

Because many instructors expect to jump into the technology first, they are surprised when the Hybrid Academy starts with a series of discussions concerning course redesign, pedagogical shifts, and consequent changes to syllabi—all of which, we believe, are required to go hybrid. Larry Beason (2000) noted this predicament in preparing instructors to teach with the Web. The challenge, he found, is to achieve "balance between helping prospective teachers despite instructors' sometimes overwhelming desire to begin with the technical aspects" as well as to help "them consider the pedagogical implications" (p. 26) of their technological choices. Postponing interaction with and on computers and instead focusing on discussion and planning enables instructors to better reconceptualize their courses, in their teaching style, without limiting themselves to perceptions of what the technological tools can accomplish. In doing this, we insure a more stable culture of use, as instructors' pedagogical choices are not dependent upon a specific set of technological tools (such as WebCT, Blackboard, or more generically, wikis and blogs). Rather, if and when the platforms for delivery change—whether through administrative means or through personal pedagogical choices—instructors are able to transfer and continue to transform their pedagogies from old platforms to new ones with minimal interference. In other words, the pedagogy—not the platform—is the foundation for their courses.

For precisely this reason, the Hybrid Academy begins with a series of syllabus workshops, which is as much about rethinking course delivery as it is about restructuring the content. One of the first considerations for teachers new to teaching with technology is managing the shift from physical to virtual space. University instructors rarely have the opportunity to design their learning spaces, nor are they typically required to inform students how instruction will occur in the physical space. In fact, instructors and students bring certain expectations based on common experiences: students will sit in their seats, notes will be written on the chalkboard, papers will be submitted to the instructor at the start of class, and so on. Teaching online provides the exciting, but potentially overwhelming responsibility, of designing the course beyond the usual steps of choosing textbooks and creating assignments. No longer can the instructor simply walk into a classroom and without much thought utilize the available equipment. Rather, the virtual space where students will convene and learn must be thoughtfully considered as faculty begin to plan and shape their courses. Consequently, the basic assumptions, expectations, and practices of teaching are altered—even challenged.

Although many instructors will use an available course management system, there are many, many decisions to be made within that system including, but not limited to, how students will access information; interact with the content, with each other, with the instructor; and submit their material. Choices to be made about the layout, color, icons, and so on can also carry a significant impact on the course. Additionally, a course management system may operate on a set of pedagogical, or even functional, assumptions that don't entirely sync with an instructor's pedagogy or process and may create barriers in many circumstances. Therefore, instructors need to identify first their pedagogical assumptions for the online classroom and carefully consider ways to create the most effective virtual space—even if it is within the confines of a content management system that doesn't completely support their pedagogies.[12]

Mike Palmquist, Kate Kiefer, James Hartvigsen, and Barbara Goodlew (1998) advised that "as teacher–trainers, we cannot expect participants in our training programs to infer our assumptions" (p. 202). The same will be true in the parallel case of instructor and students. To avoid confusion and frustration, "we need to explain explicitly how our design decisions at all levels (classroom layout, syllabus, writing tasks) reflect our goals and expectations for the" hybrid course (p. 202). Many of these assumptions and decisions should be articulated through practical revisions and additions to the syllabus. For example, a traditional syllabus would not provide students with directions to the classroom or tell them how many words they are expected to speak in class. Yet, directions for attaining access to an online course need to be made explicit, even for the always-on student. Students also need to be explicitly told how often they are required to log into the class, if their virtual presence is expected at designated days and times, and how many words count as participation. Many of these considerations are off the radar for teachers new to hybrid environments and are often considered only after something goes wrong. Facilitating a discussion where instructors consider policies and the impact of design decisions prevents some of these disasters from occurring while they are teaching the course. Also, because instructors play the role of student in the Hybrid Academy, they experience these types of questions from the student perspective. This experience, combined with discussion with other teachers, enables instructors to troubleshoot their courses before they go live. Without these considerations, both instructors and students can quickly become frustrated with the new delivery format. These frustrations accumulate and lessen the chances of establishing and/or sustaining a culture of use.

All of these considerations, individually and collectively, impact the syllabus, so it is not surprising that instructors often find that a complete syllabus and course calendar revision is required to reflect pedagogical changes. Working with instructors to increase the overall precision and transparency of their goals and objectives in the syllabus creates a clear and

[12] What happens when an instructor is faced with the reality of using a CMS/LMS that poses a direct conflict to the instructor's own pedagogy? Does the instructor make this fact transparent for her students? Or does she do the best she can with the tools provided? There are serious issues involved with using tools that create roadblocks to true interaction and collaboration, though for the purpose of the Hybrid Academy, these issues were only dealt with on the periphery, because part of the instructors' goals included acclimating students to university technologies and policies and, like it or not, most of the students would end up using the chosen CMS/LMS beyond just this one hybrid course. On the other hand, there's little chance that students would ever use the CMS/LMS to the extent that they would in a hybrid composition course.

refined document. The hybrid course syllabus should become the roadmap, master plan, and strong, clear foundation for the course itself—for instructor and students alike.

Mapping the Course: Designing a Hybrid Course

Once a course is reconceived through the syllabus workshops, and some basic technology has been introduced, instructors draw course maps in the form of diagrams or flowcharts for their entire course, paying close attention to separating their F2F teaching days from their hybrid teaching days. After they design the “big picture” for their course, they similarly outline specific activities and assignment sequences using a spreadsheet document designed for this purpose. The resulting map becomes vital to Academy directors who can then begin to assess the effectiveness and feasibility of the instructor’s initial plans. It is also invaluable to the instructors, as the map will guide them through both the design phase and the actual teaching of the course. Interestingly, mapping wasn’t an original part of the Academy plan, but it came about partly because composition faculty were already familiar with teaching students how to create concept maps and idea clouds.

Introducing Technologies to the Redesign

After this course redesign, Academy participants are ready to fit their pedagogies to the technologies that will facilitate them. Designing shared spaces that allow for interactions (including those between student and content, student and instructor, and student and student) becomes the integral part of creating a genuinely engaging hybrid course (see Brunk-Chavez & Miller, 2007). Instructors are advised to avoid the “busy work” that can result from the shovel-ware approach and to look instead for ways to incorporate various available tools that will enable them to create meaningful, often collaborative, learning experiences that are frequently referred to as “modules”. These learning modules collectively form a framework that results in a rich learning experience—an experience that could potentially be viewed through Fleckenstein’s (2005) “ecological orientation,” where “the constitutive elements of a system are co-dependent. Each possesses an identity only within the context of the other’s actions and by means of the other’s actions” (p. 153). Learning modules aren’t enclosed systems unto themselves (in terms of single interactions between the student and the content alone), rather, they have the potential to require and leverage communication and collaboration between students. Through revising content and assignments for increased interaction and continuity, faculty consequently streamline the course to the point where they create time to handle the new sets of interactions central to a hybrid course. Engagement through meaningful interaction and the efficiency of the course sustain the interest in online courses from both student and instructor perspectives.

As for initiating actual work with the course-supporting technology, we agree with Angela Crow (2000) that when teaching technology, the “sequencing of assignments needs to be based on scaffolding concepts and on building the most fundamental and most vital skills so that through repetition, students learn the necessary concepts” (p. 405). The Hybrid Academy is no different than a classroom in this respect. We assume that our instructors will possess a common skillset as they enter the Academy. In most cases, this is a safe assumption; however, regardless of the advertised “ease of use” of a given technological tool, there is always a learning curve. For some, the learning curve is just a minor hurdle, but for others the curve can more closely resemble a complete roadblock. For the latter case in particular—remember that most Academy participants are not early adopters—various aspects of the technology they will be using are broken down and presented in simple, short, hands-on training sessions often lasting for only 20–30 minutes. These quick technology training sessions evolve into more complex discussions pertaining to the pedagogical and/or practical value of each tool, as well as alternative ways of accomplishing tasks, not to mention alternative ways of using these tools. Through this scaffolding, information overload can be avoided (or at least minimized), and teachers can be encouraged to try, apply, and utilize the skills acquired during the previous training sessions.[13] Crafting these experiences requires Academy directors to facilitate constant learning, but also to protect participants against being overwhelmed. Nothing kills a technology buzz faster than moving through the steps too quickly.

Instructors quickly notice that working and learning with their departmental colleagues is valuable at moments when frustration levels run high. Instructors can learn from each other in ways that they do not—and sometimes cannot—learn from the technology experts who occasionally look down on those new to the technology. This experience fosters a communal knowledge-building among the instructors, often referred to in composition studies as lore. Stephen North (1987) wrote that “communal lore offers options, resources, and perhaps some directional pressure,” although he noted that “the individual, finally, decides what to do and whether (or how) it has worked—decides, in short, what counts as knowledge” (p. 28). The development of lore within the Hybrid Academy experience lays a foundation for sustained development and discussion, as instructors share tips, tricks, strategies, and pedagogical and technological insights with each other, further shaping and cementing their learning.

Modeling Peer Evaluation and the Microcosmic Culture of Use

The Hybrid Academy models actual hybrid courses on a micro level by using discussion boards, schedules, surveys, assignments, and small, interactive assessments to deliver content, generate development, and provide a shared virtual space for course development and learning among instructors. Through this modeling, Academy participants simultaneously experience the space as student, instructor, and developer. This is a crucial and core aspect of the Academy experience, as faculty are not expected to have the time to put themselves in students’ shoes during a frantic semester, nor do are they expected to possess the desire to do so.

Stuart Blythe’s (2001) suggestion of “adopting a user-centered attitude toward course design where design is on-going based on feedback and input from the users” (p. 338) is reflected in this approach. The participants’ individual courses begin as a blank shell where they can build and experiment without the pressure of a set of live students subject to their experimentation. After an initial period of course development, the courses are made available to other Academy participants, who are asked to anonymously assess each others’ courses on usability, clarity, and general course design, all within the framework of a “best practices” approach (Chickering & Ehrmann, 1996).Employing a strong peer evaluation component maintains a critical feedback loop that produces a wealth of suggestions and improvements—allowing instructors to both give and receive feedback without the pressure of trying approaches for the first time on real students. This experience becomes one of the most fulfilling parts of the Academy. Through the experience of learning in the course while also creating their own course, instructors bond with each other on multiple levels and form a network that, once again, supports a culture of use within and beyond the Academy.

[13] It’s important to note here, that, for purposes of introduction to technology, the “tool” metaphor for technology is serviceable, if perhaps, still unfortunate. It continues to hide the bigger picture of what’s actually happening in the learning space formed by the academy.

MAKING THE ACADEMY MODEL PORTABLE

Although our composition unit's first concern was effective hybrid teaching within its own program, an important secondary concern was the portability and sustainability of the model across campus. First-year writing would not be the only program asked to pursue alternative delivery, particularly after surveys and course studies began to reflect the efficacy of teaching in a hybrid format. Additionally, without an established culture of use throughout the campus, first-year composition hybrid courses would remain an anomaly—a first-year experience for some students, but not an experience across the curriculum, within majors, or in upper-level courses. The sustained success of hybrid courses is dependent, at least in part, on acknowledgement, assessment, and adoption. A closed loop involving only composition would eventually lead to other disciplines discrediting the Academy model for being solely focused on one discipline. Simple replication, then, is not enough to sustain a culture of use. The resulting replications must comprise a larger system (Taylor, 2001, would use the term "swarms"), and yet share similar goals, attitudes, and direction.

Based on the successes and, yes, failures, of the first Hybrid Academy, the next step of the project, therefore, was to create a portable model simple and dynamic enough to be a framework for developing an academy, but one that did not make up a completed, static structure. Leaders agreed that some topics should remain common across all Hybrid Academies: syllabus and course (re)design, evaluation and assessment, communication and collaboration, and basic course management. Nevertheless, the model had to allow for discipline-specific alterations and individual faculty and student input where warranted.[14]

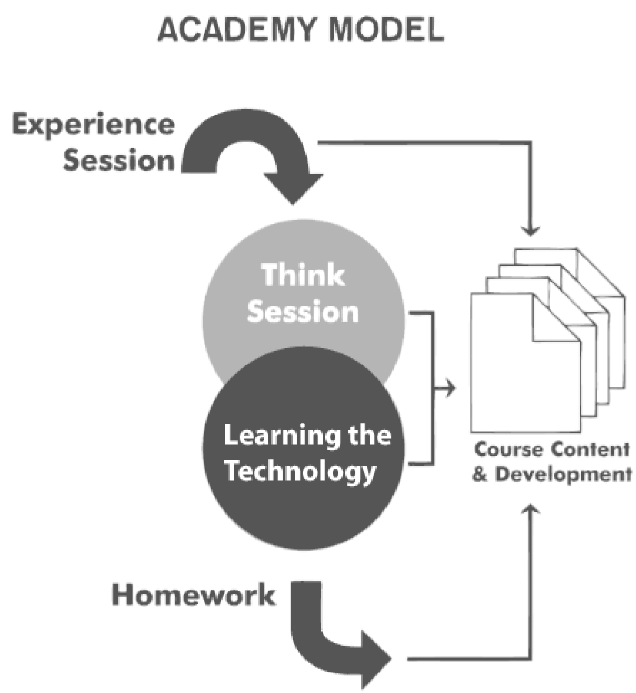

Figure 2. Academy model (Palsole & Miller, 2006).

[14] At this point in Hybrid Academy history, Instructional Support Services, lead by Sunay Palsole and Shawn Miller, began streamlining and otherwise improving upon the original Hybrid Academy in large part to make it portable across disciplines.

The resulting academy model (see Figure 2) is both simple and cyclical. The figure above represents one day's activities—one day's learning and development cycle, which is repeated daily for an intensive, consecutive 4–6 day academy. "Experience" sessions are short sessions that plunge faculty into a student-simulating situation. These are typically followed by theoretical conversations about technology, teaching, and the hybrid experience called "think" sessions. Next are the "learning the technology" sessions, which are practical, hands-on sessions that relate directly to the topic of the think session. Academy participants leave the workshops with homework assignments to be completed online, including assignments, discussion board postings, or course-development projects intended to help faculty produce or revise their existing course materials for hybridization. No matter what discipline is participating in the Hybrid Academy, sessions must be carefully coordinated so that they feed back into course content and development; otherwise, they become a scattered and fragmented set of workshops that do not promote a cohesive and sustainable program.

Because the model is relatively simple in its design, each new discipline that enrolls in the Hybrid Academy is able to address their unique pedagogical concerns. This is especially important because, as Selber (2004) explained, "if teachers…leave technology design and education to those outside the field, it is entirely probable that students will have a much more difficult time understanding computers in critical, contextual, and historical ways." Perhaps more significant, "technology designs, informed by pedagogical and cultural values not our own, will define and redefine literacy practices in ways that are less than desirable" (p.13). Although we now have a portable, sustainable model for hybrid academies, it remains no less important to allow the model to be shaped by the specific needs and characteristics of a given discipline. Without such an approach, the culture of use initiated by the Hybrid Academy will not be sustained.

Promoting the Hybrid Idea

In *Sustainable Computing Environments*, Richard Selfe (2005) argued that if we

> are to extend the efficacy of [our] instructional efforts in technological environments, [we] need to keep [our] general priorities as humanists straight: focusing first on the literacy needs and talents that students exhibit and the collective talents that teachers, administrators, and staff members can bring to bear on instructional problems. (p. 12)

To accomplish this, he suggested considering the roles and importance of people first, pedagogy second, and technology third. Similarly, we realized that to create a culture of use on our campus, where teaching with technology becomes fully integrated into our pedagogies, we had to first—and then continuously—generate buy-in from faculty, students, and administrators. The difficulty with doing so is that, until the actual outcomes start becoming more and more apparent, it is somewhat difficult to see the obvious difference between average technology training and support, and the holistic approach of the Academy. The growing amount of positive research about hybrid learning did make this process somewhat easier, however.[15] We agree with Michael Moore (2005) that

> compared to many other promising innovations in the distance education field that end up being reduced to no more than dovetailing new technology to old pedagogies and institutional structures, [blended or hybrid learning] is an

[15] See, for example, Charles Dziuban, Joel Hartman, and Patsy Moskal (2004); Harvey Singh (2003); Randy Garrison and Heather Kahuka (2004); and Robert Albrecht (2006).

> innovation that almost inevitably leads to significant changes in both pedagogy and the way resources are apportioned and applied. (p. 129)

Of course, we saw the potential for change as a real opportunity for growth in our program. We also knew that faculty who had an interest in teaching with technology but didn't know how to get started could "get their feet wet" by learning how to develop a hybrid course. It is not essential for faculty to have previous experience in teaching with any sort of technology. What they must possess, however, is a willingness to experiment with their pedagogy—to take risks with their teaching. In our experience, it wasn't difficult to find groups of faculty excited about taking on a new challenge in the classroom and interested in the value of teaching in some type of online format.

Building upon this excitement and interest, the Hybrid Academy is designed to provide a space for faculty to examine, consider, and rejuvenate their pedagogical foundations and practices. Lisa Gerrard (1991) and Robert Samuels (2004) have both noted this lack of space; Samuels argued that "due to [the] temporary institutional status of most compositionists, there is rarely enough time to experiment with new technologies and to take risks by developing pedagogical and curricular innovations" (p. 64). Seasoned teachers of writing rarely have the opportunity to reconsider so completely their pedagogical assumptions, their teaching styles, and the effects these may or may not have on students. Participating in a Hybrid Academy where the training does not simply facilitate or replicate current teaching practices, but provides the valuable opportunity for instructors to experiment with and improve their pedagogies enables instructors to become aware of pedagogy in a way that does not often occur in typical training workshops.

In addition to the pedagogical and philosophical reasons for participating in a Hybrid Academy, the material conditions of the instructors must also be considered, particularly if the participants are graduate students or lecturers. Many times, less-than-desirable working conditions are exasperated when technology is introduced. Kristine Blair and Elizabeth Monske (2003) noted that, especially with distance learning, instructors may "benefit the *least* within these new virtual communities" (p. 449) because "technology-based pedagogies require significant labor in design, development, and delivery. Much research shows that fully online courses require more up-front planning, more detail in design, and just as many, if not more, contact hours with students than traditional, classroom-based courses" (p. 447). For instructors teaching with technology and/or in a hybrid format for the first time, the initial planning and learning time can be a serious drawback. For this and other reasons—including the fact that UTEP had been mostly untested as a university population ready for hybrid learning—incentives were provided to the group. These first-time incentives included a laptop and portable projector (to ensure both an understanding of and access to the everyday classroom technology), a reduced course cap for three semesters (from the usual 25–27 students to 18), and funding for professional development related to teaching writing with technology.[16] Of course, most universities cannot provide this level of incentives for long, if at all. Academy leaders should be keenly aware of what incentives are meaningful to instructors, as each program's working conditions vary. We have found, though, that over time, as instructor use cases and proven experiences start to accumulate, incentives are no longer necessary. Instructors participate in the Academy because they choose to or because their department encourages them to redesign their course delivery. In any case, participating in a Hybrid Academy needs to be worthwhile professionally and personally, rather than something

[16] Future hybrid academies outside of the composition program chose to negotiate a course reduction for their training and/or pilot semesters. As the academy has become an established component of Instructional Support Services, most instructors who participate do so by their own choice. Departments are no longer required to provide the incentives we gave at the start.

a chair or dean is forcing them to do. To sustain a culture of use, past participants of the Academy must “pass on” their excitement to the next cohort of participants. They must also be willing to continue—if not expand—their delivery of hybrid courses over time.

Student awareness and buy-in are also critical aspects of the Academy, and ultimately, an integral part of the resulting culture of use. Virginia Crank (2002) wrote that “a traditional classroom, no matter how we arrange the chairs, still inherently places the teacher at the center of all discussions, as moderator, validator, authority” (p. 147). For some students, the idea of moving into a virtual space and thereby removing the teacher from the center of the classroom creates a great amount of distress, particularly for first-year students. Despite this apprehension, many students may also be looking for a learning experience that “extends beyond the four walls of the college buildings and beyond the confining traditions of writing instruction” (Crank, p. 154). Of issue is, however, if students are able to assess how well-suited they are for hybrid courses, especially if they are new to the university and the rigors of college life. In our pilot semesters, instructors found lack of student awareness to be one of their biggest challenges in teaching a hybrid course. Students need to know that they are enrolling in a hybrid course and what it means to be in a hybrid course. Acquiring this knowledge requires providing information to advisors and new student orientation teams, as well as disseminating the proper information within the university’s course catalog and enrollment structure. Developing an online survey to help students determine the suitability of an online writing course is a good service to provide as well.[17] Articles in the student newspaper, a link to hybrid information on the department or program Web site, and presentations in pre-requisite courses are other places to create awareness and an atmosphere of excitement and advancement.

Clara Fowler (2003) advised instructional project designers to “identify your stakeholders,” those “external groups that will have a stake in the success of the project” (p. 43). For most of us, these stakeholders are administrators at various positions throughout the university. The Academy leaders quickly learned that although one group of stakeholders encouraged alternative delivery of courses, not everyone was so enthusiastic. It is important to understand early who holds what expectations for the project and who will be able to determine the ultimate continuance of it. Once the stakeholders are on board with the project, it is important to keep communication open. Keep them informed of the progress in training and the successes in implementation. Lack of administrative support is one of the surest ways to squash what might be a productive program, and support sometimes dissolves when administrators are not appraised of an initiative’s results and impact.

Just as with most curricular changes or delivery modifications, administrators should realize that new hybrid instructors require a “growing period” that might sometimes be painful. During the first semesters when instructors are learning to teach comfortably and effectively with technology, student drop rates may run higher or end of semester evaluations might not be as stellar as they usually are.[18] These initial outcomes are typical of any significant programmatic

[17] Several self-assessments are available on the Web. We have adapted ours from Colorado Community Colleges Online: “Is Online Learning for Me?”

[18] An informal study at UTEP indicated that hybrid drop rates were higher than the traditional classroom drop rates. In fall 2005, the second semester of the hybrid program, the drop rate for hybrid courses was at 22%. The drop rate for traditional courses was just over 18%. While we believe there are a variety of factors that should be accounted for, the “numbers,” are what administrators may be interested in. One significant factor to consider was the uncertainty of student acceptance of the hybrid format in the first few semesters hybrids were implemented. This led to an unofficial practice of openly inviting students who may feel the least bit “uncomfortable” with taking a hybrid course to drop the hybrid course and switch to a

change, especially when introducing new methods of instruction.[19] In the case of hybrids, this includes technological changes as well, which, until a culture of use is established on the campus, may illicit student objections to lessened lecture time and the increased need for student time-management. For the program to prove its success, individual instructors, as well as the entire project, should be given the space to make mistakes, revise, and regroup. Together, program trainers and administrators should develop and agree on criteria for evaluation, ideally before the classes become hybrid. These criteria might include, but are certainly not limited to, student performance, drop and pass rates, teaching observations, student evaluations and surveys, and instructor evaluations and surveys. Student and faculty enthusiasm must be joined with administrative support to grow and sustain the culture of use on campus.

Strategizing for Success

Those of us in composition studies have long known the value of carefully crafted assessments. In the first three semesters, Hybrid Academy directors took Trudi Hahn's (2003) data-collection advice to "focus energy on collecting and analyzing only what you will use to measure the goals you are trying to achieve" (p. 96). Academy directors assess instructor attitudes toward and skills in using technology using a pre- and post- Academy survey. Additionally, summary surveys for Hybrid Academy participants are performed at the semester's end. Online surveys for students participating in hybrids are given during the first week of classes, at mid-semester, and finally, at the semester's end. All of these measures provided valuable data concerning the Hybrid Academy itself as well as what happens when the participants' courses go live. Combined, they helped to create and sustain the portable framework discussed above, as well as provide feedback to the individual instructors.

We happily discovered that toward the end of our pilot semester, survey results showed over 70% of students accepting and/or recommending hybrid courses.[20] Students—who, at the

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traditional course. Additional factors we see as contributing to these numbers included the misinformation coming from our academic advising units (many of whom thought hybrid courses had to do with fuel-efficient vehicles). This was an issue that was quickly remedied, but magnified the need to incorporate as many people into the hybrid initiative as possible.

We also want to note that although this 22% drop rate may seem high to some readers, it is not alarming at our institution which has a great deal of student movement in and out of classes—particularly first-year classes—through the first 2 weeks of each semester.

[19] Many scholars studying hybrid learning often lump together (or find synonymous) data collected from students in distance learning courses and hybrid courses. An important point to consider is the audience for such courses. Students in distance learning courses are more than likely taking such courses because they have a real, direct need for taking a distance course rather than a traditional course (e.g., location, work schedule, family needs). That is to say, few students would probably "prefer" a complete distance course in most cases, but necessity drives the demand. Conversely, students in hybrid courses can easily opt out without drastically rearranging their schedules and lives to accommodate such a change—thus, students are less likely to "stick out" a hybrid course that they're uncomfortable in than a distance learning course wherein they've already spent several hours going through orientations, learning course protocols, paying extra fees, or where that's their only choice for instruction.

[20] This means that just fewer than 30% of the students surveyed did not accept or recommend hybrid courses. Their comments state that issues such as reliable access and technology

start of the semester, didn't know what a hybrid course was—were able to outline the benefits and drawbacks of hybrid courses, just as clearly as the faculty themselves; most pointed out that the benefits far outweighed the drawbacks. Among other things, these results reinforced the need for and benefits of Hybrid Academy participation as faculty shift their courses online.

What we believe has made the Hybrid Academy successful is that at its core it heeds Cynthia Selfe's (1992) wise advice to avoid "a nearsighted and limited focus on the technology itself rather than on the instruction it supports"; we need, instead, to train and encourage "educators to think critically about *how* and *when* virtual environments can support the educational objectives of teachers in composition classrooms" (p. 24). Using this as a starting point, we've created this list of tips for those considering ways to create and sustain a technological culture of use on their campus. Although many variables undoubtedly exist at different schools, we feel that the following should be constant:

- **Understand and articulate the need for training:** Demand that instructors be prepared to teach effectively with the technologies.
- **Go beyond functional technological literacies:** Provide instructors with the opportunity to become empowered users of technology. Teach them more than how to use the tools.
- **Ask for volunteers, but also invite selected faculty members:** Let the trailblazers lead the way on your campus, but don't overlook those instructors who haven't worked with technology much.
- **Identify advocates and allies:** Look for other departments that might participate in training, and identify centers and other spaces of campus support on campus.
- **Create positive buzz:** Provide faculty and administrators with scholarship that supports hybrid courses as effective. If possible, bring in people—faculty, administrators, even students—to share case studies.
- **Find time to work:** People need to be willing to give up about a week to work with each other on their courses. Don't save time by focusing exclusively on the technology, and don't underestimate the importance of course redesign.
- **Get organized:** Course materials, course goals and objectives, and shareable content can all be worked out ahead of time, and courses being prepared for hybridization benefit greatly from doing this in advance.
- **Take advantage of tools and options available at your university:** Be flexible with your options and choices.
- **Look to the Web:** There are growing amounts of free resources available to faculty who want to hybridize. Work with graduate students and/or other departments to help choose free wikis, blogs, and other tools that may help create a virtual course space.

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glitches (our favorite was: "sometimes the internet is stupid") were commonly cited reasons for discontent. Interestingly enough, some students said they did not like hybrid courses for reasons we would deem as positive: it forced them to manage their time more effectively, made them work more with other students, and required that they learn to use computers.

- **Plan for assessment and continuous improvement:** Although it is important, don't rely exclusively on anecdotal evidence that teachers teach better and students learn more in a hybrid course. Be able to provide evidence.

As we send this chapter to press, the Hybrid Academy is half-way through its fourth year. To date, the Academy has assisted over 50 instructors in redesigning their courses, the demand for the Academy is still steady,[21] and the number of hybrid courses offered increases each semester.[22] Although Instructional Support Services hopes to sustain this momentum, there will come a time where our campus reaches that mid-life crisis that other writing and technology across the curriculum initiatives often face. Already, though, we are looking ahead; Instructional Support Services is seeking to hire additional instructional consultants and considering creating technology ambassadors who will encourage late adopters in their departments or colleges. It is our hope that through a careful reflection on the Academy, and by writing chapters such as this one, we can continue to think critically about our approaches and revise and renew them until the general culture of use on our campus has grown to the point that such programs as the Academy may not be necessary—as hybrid courses appear on the schedule with more frequency and as the culture of use expands far beyond the necessity of a Hybrid Academy. This would, in the future, allow us to at least partially reallocate expertise into better design and assessment of hybrid courses, instead of continually training and informing new hybrid instructors and students.[23]

Beth Hewett and Christa Ehmann Powers (2005) stated that online educators "often need specific training for online writing instruction—training that transcends technological skills or specific platforms—as they prepare to teach in online writing environments" (online). They found, however, that "the subject of preparing educators for online writing instruction is insufficiently discussed in published literature" and consequently called for "more professional discussion about training and professional development programs for online instructors" (online). We hope that this account of our experiences creating a culture of use on our campus will contribute to an ongoing conversation about the most effective, efficient, and sustainable ways for training university and college faculty to reach and teach the always-on student.

[21] Although 50 may not seem like a large number, Hybrid Academies are run twice a year and admit 10 participants per session. ISS reports that the academies are full shortly after being announced. Additionally, this does not account for the number of faculty who have participated in Technology Leadership and Teaching Online academies.

[22] For example, the Composition Program is currently engaged in a redesign in which all second-semester courses will eventually be delivered as hybrid courses within the next 2 years, and several Rhetoric and Writing Studies courses are regularly offered as hybrids.

[23] Although the Hybrid Academy and other technology initiatives are still new enough that we haven't had to deal with significant sustainability issues, we need to consider what happens when and if faculty lose enthusiasm. What can we do when and if the academies aren't immediately filled by eager faculty? Writing Across the Curriculum literature provides valuable insights into how to maintain momentum. Interested readers might want to refer to Rebecca Jackson and Deborah Morton's (2007) "Becoming Landscape Architects: A Postmodern Approach to WAC Sustainability." Also of interest is McLeod, Miraglia, Soven, and Thaiss (2001), *WAC for the New Millennium: Strategies for Continuing Writing-Across-the Curriculum Programs.*

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CHAPTER	9
TITLE	Using the LEED Evaluation Tool to Assess the Sustainability of Computers and Writing Programs in 2-Year Institutions
AUTHOR	Kip Strasma
OVERVIEW	In a Burkean context where nomenclature shapes reality, the language and categories with which we assess say a great deal about the "reality" we construct. Leadership in Energy and Environmental Design (LEED) and the U.S. Green Building Council provide an advanced and detailed language for evaluating design elements holistically and interdependently, and their methodology introduces a useful metaphor for digital writing programs desiring sustainability, efficiency, quality, awareness, design, and innovation. In this chapter, I adapt LEED's terminology—site development (physical layout of computer classrooms), resource savings (efficient use of digital and printed resources), energy efficiency (effective management of human resources), materials selection (selection of computer hardware and software), and environmental quality (department climate that includes placement and writing lab support), as well as LEED's rating system consisting of certified, bronze, silver, and gold. Using these elements—to illustrate how leaders at institutions can think critically about multiple and interrelated program elements with a goal toward building a digital writing ecology that can be sustained over time and that will co-exist with competing interests.
TAGS	adjunct, articulation, assessment, awareness, classroom design, community college, design, diversification, ecology, E-Write, global, ICC, Illinois Central College, Kip Strasma, labs, laptops, Leadership in Energy and Environmental Design, LEED, life-cycle replacement, local, resources, site, sustain*, technoecology, technolog*, training, Two-Year College Association, two-year college, TYCA, United States Green Building Council, wireless, workstations
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Using the LEED Evaluation Tool to Assess the Sustainability of Computers and Writing Programs in 2-Year Institutions

Kip Strasma

I have taught in a first-year writing program at a 2-year college for almost two decades, and have held the positions of faculty, administrator, and dean; recently, I've relocated to South Florida and have taught in 4-year writing programs as well. Across these roles and within these different institutions, my desire for a sustainable computers and writing program has been constant. In 1996, a colleague and I from Illinois Central College (ICC) wrote an assessment of technology within ICC's writing program for NCTE's *Teaching English in the Two-Year College*. In the article, Paul Resnick and I described the urgency of 2-year colleges and first-year writing programs to accelerate technology utilization with, at the time, the growing use of email and the World Wide Web. We documented the absence of writing teachers' voices from the conversation about how to establish, administer, and sustain emerging computers and writing programs. Then, ICC's primary concern was the legitimization of teaching writing with computers, and we advocated involvement by teachers of writing in this process:

> In the face of the gap between where our college and others like it are now and where we are supposedly going, English and writing faculty must move forward forcefully or risk losing access to many of the advantages that computer-supported pedagogies make possible, and, as we have argued in this essay, in order to realize these advantages, faculty should oppose solely print-based notions of literacy acted out in policy decisions at the institution. (Resnick & Strasma, p. 210)

We were also interested in local control over the identity and definitions of ICC's writing program. We argued that direct intervention by faculty members informed by digital writing pedagogy is the only appropriate course of action. Writing instructors must play an active role in the purchase, layout, distribution, and use of new computer technology. We noted that those of us who appear to be losing local struggles should actively make use of the work of colleagues in other places as possibly the best place of compelling evidence and persuasive data for creating viable electronic writing spaces. Indeed, our call was both to action within and beyond the department; we needed to address complexities that spanned from negotiating shared classrooms to addressing complexities of teaching writing with new technologies.

Just over a decade later, in 2008, I can answer affirmatively that, yes, many programs have expanded computer access, and many have also moved away from experimentation to legitimization. Like many colleges, ICC has, for example, experienced the economic and electronic tides of local-area networks, wide-area networking, and enterprise-class software delivery. The number of computers on our campus has grown from 400 to 4,200; students have access to server storage space and a range of Internet-based services. More than 40% of ICC's classrooms are now wired, offering Internet access and data projectors. The department has dedicated computer classroom space that makes it possible for 85% of all writing classes (developmental, transfer, and advanced) to be assisted with digital technology. Although so much has changed, and although ICC continues to identify itself as a legitimate player in enhancing student digital literacies, questions related to how the program is doing and what its future will be remain—even loom. Faculty and administrators continue to ask questions like:

- Are we far enough along in our abilities to sustain a healthy ecology for a first-year, digital writing program?
- Do we have sustainable systems to train and support faculty to use technologies effectively for the teaching of writing?
- Do we have a sustainable set of support services for students writing in computer classrooms?
- Do we have an administrative plan for sustaining and growing the gains we've achieved?
- How can we assess our current status so that we can learn from the past and design effectively for the future?

THE NEED FOR ASSESSMENT

The first-year writing program at ICC has almost 125 adjunct and full-time faculty who teach almost 300 developmental and transfer writing classes to over 5,000 students each year. In my experiences working with 2-year colleges and with the Midwest Regional Association of the Two-Year College Association (TYCA), I believe the program is typical of most across North America, and I think many will find similarities between their own departments and ICC's experiences. ICC's situation may well characterize the ongoing struggle at other first-year writing programs at 2- and even 4-year colleges: that is, identifying their place and stake in the face of often widespread technological change and development on their campuses. In fact, a study by TYCA and sponsored by the Conference on College Composition and Communication (CCCC) posited that many first-year programs still require an awareness of their status in technoecologies, and their roles as stakeholders in campus technology efforts. Dubbed the "TYCA Research Initiative," researchers Jody Millward, Gregory Shafer, and Dianne Fallow (2006) asked survey respondents to assess technology access among teachers and learners at their institutions, as well as to respond to inquiries about program development. Their recently published report, authored individually by Millward (2008), concluded that much is yet to be learned for a sustained ecology:

> Two-year colleges have invested heavily in infrastructure, yet faculty and administrators have been slow in positing key equity questions, e.g., which students at what time and with what faculty are using campus technologies and to what benefit. . . . Careful studies will enable colleges providing technological access to secure what they have and advocate for more, provide a basis for faculty to work with administrators in planning effective use of resources, and provide administrators with the foundation they need to seek funding support in their communities and state legislatures. (p. 391)

As data collected through this national-scale project emerges, evidence continues to demonstrate the need for knowledge about how writing programs identify and assess computer-supported instructional needs. The survey reveals that, because first-year writing programs are at different stages of development and have unique priorities, an assessment tool would be particularly useful in establishing goals for future staffing and budgeting. Identifying an assessment tool is the primary purpose of this chapter.

As ICC is at this juncture of assessing the relationship of progress and sustainability, I expect other first-year programs are as well. In my roles at a large community college, it has been helpful to think *terministically*, as Kenneth Burke (1966) defined it: That is, thinking in a way that points attention to things that we would not normally notice—a way of mentally highlighting. Burke explained that observations are implicit in terminology: “many of the ‘observations’ are but implications of the particular terminology in the terms of which the observations are made” (p.46). In this context, the language with which we assess says a great deal about the reality constructed by and through that language. True, there are many possible models for assessment that provide terms for this reality, as English departments and composition specialists are not the only professionals to address methods of assessment and questions regarding sustainability. The Higher Learning Commission (HLC), for example, has authorized the use of scheduled, periodic assessments of quality through its Academic Quality Improvement Program (AQIP).

It is true that many institutions have endorsed other quality process initiatives such as the Six Sigma approach.[1] Research that emerges from Composition Studies provides specific approaches, and recent efforts by Richard Selfe (2005) identified the need for ongoing, formative assessment that takes into consideration an expanded notion of composing. In particular, Selfe offered a continual, team-based, stakeholder-oriented, five-step process for “creating and re-creating technology-rich environments for teaching and learning English and language arts” (p. 122). It is hard to fault this teleology, and Selfe provides strong advice for identifying the interests involved in his model, where he maps out the interactions among key agents involved in sustaining computers and writing environments. A complementary and connected facet is to not only identify interests, but also to identify the values these agents possess: balance, sustainability, efficiency, quality, awareness, design, and innovation.

In this chapter, I build upon Selfe’s (2005) efforts by presenting a model for holistic assessment and sustainability adapted from the United States Green Building Council. Chartered in the 1970s, this organization offers a rich resource for anchoring assessment; the organization is interested in holistic construction, framed by the question: “How well does a construction event steward its environment?” Its Leadership in Energy and Environmental Design (LEED) assessment tool has emerged from many years of research and offers well-illustrated details on how to assess a sustainability effort. Specifically applied to computers and writing programs, LEED inquires into the extent that composition integrates well into its computer ecology—or addresses the question: “How well does a composition program balance the many constraints of its computer environment both for the short-term (e.g., semesters or years) and the longer term (e.g., many decades?)”

This is an important question—one often answered not with detailed, robust responses, but with quick-fix answers (often due to the lack of an assessment tool to guide responding to the question). A LEED-inspired model complicates such any such simple answers by inviting assessors to account for the intricacy of interests and agents invested in any computers and writing program. In what follows, I’ll provide an overview of the LEED model, and then describe the ways in which the model can be a useful tool for assessing computers and writing programs. I conclude with an assessment tool for first-year programs that measures how to situate and how to sustain computers and writing programs.

Academic Quality Improvement Program (AQIP)
http://www.hlcommission.org

United States Green Building Council
http://www.usgbc.org/

Leadership in Energy and Environmental Design (LEED)
[http://www.usgbc.org/DisplayPage.aspx? CMSPageID=222](http://www.usgbc.org/DisplayPage.aspx?CMSPageID=222)

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[1] A popular approach in industry, Six Sigma is a business management strategy originally developed by Motorola. Originally designed to identify problems in manufacturing processes, the model has expanded and can be applied to management and work-flow processes. The strategy a process of defining, measuring, analyzing, designing, and verifying to measure outcomes.

THE LEED MODEL

To illustrate what an ecological assessment of program sustainability might look like, I've adapted four elements from the LEED evaluation tool: Site, Resources, Awareness, and Design. These elements of the LEED model are the most important for sustaining computers and writing programs (but they do not represent the entire LEED system).[2] LEED provides a holistic, data-based, detailed rating system from which to complete an assessment of a computers and writing program. Site, resources, awareness, and design are the first considerations of any leader seeking to (re)build a composition program that finds balance with computers and vice versa. The table below lists criteria according to LEED terminology, followed by adaptations to computers and writing interests.

Table: LEED-Inspired assessment tool for computers and writing programs.

	ENVIRONMENTAL DEVELOPMENT	**COMPUTERS AND WRITING**
Site > good stewardship	The nature of a construction's integration into the overall environment—for example, Southern orientation for passive solar efficiency, sizing the building "footprint," sensitivity to habitat, etc.	The extent to which the classroom space supports multiple and diverse modes of teaching and learning in a writing program—for example, facilitating peer-response, supporting discussion, coaching, presenting, etc.
Resources > balance of needs	A sensitivity to using available resources to reduce waste—for instance, the use of local resources, resistance to products with high levels of "embedded" energy, sensitivity to overall energy conservation, etc.	The efficacious use of computers resources available to a program—how reflexively and critically resources are negotiated by competing interests, including administration, community, students, faculty, etc.
Awareness > education and development	The ability to optimize ongoing performance of agents and equipment involved—for example, utilizing local professionals, challenging conventional views, finding unnoticed efficiencies, etc.	Initial (e.g., orientation) and ongoing development for effective instruction with computers, technology, and new media—for example, how well a department provides learning that supports the critical use of technology in the classroom.
Design > innovation	Going beyond what is possible now to improve the entire ecology of site, resources, and agency—for instance, designing a roof system that collects both water and sunlight, while protecting inhabitants from the elements and providing natural cooling.	The "emergence" of insights and synergies made possible through effective leadership—for instance, the value of administrative and faculty experimentation and innovation with emerging, cutting-edge pedagogies for effective writing.

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[2] The full system of LEED includes, in addition to site, resources, awareness, and leadership/design; quality: "LEED promotes a whole-building approach to sustainability by recognizing performance in five key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality." Additional information is available at http://www.usgbc.org/DisplayPage.aspx?CategoryID=19.

These four criteria frame the key areas where competing interests must be negotiated among the agents that constrain computers and writing programs; they are, in my experience, both the areas of greatest contention and of the most pressing importance.

Site: Articulation and Diversification

In the LEED model, site relates closely to good stewardship, or the balance of construction with nature. The value of stewardship is central to the LEED system as a whole, and site attention in particular. A typical site assessment for LEED considers solar orientation, size of structure (called a “footprint”), site disturbance, mobility/transportation to and from, and more. To build or remodel a structure, for example, a LEED assessment might address the size, placement, layout, and diversity of the site. These are important considerations for sustaining computers and writing program sites as well. Generally, for computers and writing, “site” refers to the extent to which classroom space supports and encourages multiple modes of teaching and learning and helps maintain a balance of program standardization and instructional innovation. The LEED model highlights the value of an instructional space where many different pedagogies are simultaneously sustained. For instance, the model invites assessment of both specific, often individualized practices (e.g., the use of computers to conduct in-class, team-based writing) and more collectively, broad-spanning activities (e.g., the implementation of outcomes for digital writing across the first-year program). Computer classroom spaces with malleable characteristics can help faculty, as a group, identify, assess, and balance pedagogy and technology. This is the most important value to sustain, and is the beginning point for any LEED-inspired analysis of a computers and writing program.

By way of illustration, at ICC, there are several kinds of computer classrooms available for scheduling; these fall into four broad configurations: lecture, workshop, conference, and multi-function/purpose. The figures (1–4) below and videos embedded here reveal each type of space configuration.

Figure 1. Illinois Central College lecture classroom with rows.

Figure 2. Illinois Central College classroom with workshop clusters.

Figure 3. Illinois Central College classroom with conference rows (wireless).

Figure 4. Illinois Central College Classroom with perimeter workstations and center conference cables.

As part of the larger college, the computers and writing program at ICC has inherited varying spaces in which faculty teach and students learn. Which should be sustained? A non-reflective response would be, perhaps, the one classroom that appears to provide for multiple activities at the same time: coaching, writing, discussing, presenting, demonstrating, and lecturing. Student attention can be directed toward the teacher, screen, a peer's screen, a textbook, or other print materials. Teachers can move back and forth among different methods supporting writing pedagogies currently sanctioned by the National Council of Teachers of English (NCTE, 2005) for multi-modal teaching and learning spaces involving computers.

But such an answer would provide an attractive pedagogical product rather than a sustainable process for continually (re)aligning and (re)assessing a computers and writing program with technological tools and spaces. Although I believe that the last classroom shown above (Figure 4; CC 207) does embody the most robust site for digital writing classes at ICC, it is only so for now, at this particular time, at one institution. In other words, the goal with a LEED-inspired assessment tool is not to arrive at an ideal computers and writing footprint, but to provide a heuristic process for use within a specific institution. A parallel clearly exists between environmentalism and computers and writing: Technologies remain in flux while constructions are materially fixed for durations of time. What we want to sustain is not a particular classroom, but the way in which it embodies current thinking about teaching and learning.

Considering the discussion above, it should be evident that a LEED-inspired tool probes the degree to which construction elements are balanced along a continuum favoring conservation, long-term planning, diversity, and sustainability. Among computers and writing professionals, this inquiry becomes: "To what extent does the classroom site contribute to multiple and diverse teaching and learning?" and "How well does the computer classroom provide flexible, student-centered learning?" Recently, I took these questions to the University of Miami in south Florida. I was assigned to teach two classes in a classroom in a dormitory building, with a white board and desk-styled chairs; I quickly set out to find more suitable space. What I found was a 170-seat wireless lecture hall that had fixed seats at tables with student computer monitors and a teacher's station, with an LCD projector (see Figures 5 and 6). My teaching in this space was temporary (for that single term), but it represents a microcosm of a larger sustainability effort that the university is pursuing (and should continue to explore beyond single-function/single-purpose space). Although momentarily, the room provided a multiple and complex writing space that allowed me to resist the single-function-pedagogy design of the space.

Figure 5. University of Miami lecture hall: Teacher's station.

Figure 6. University of Miami lecture hall: Student view.

At ICC—while there is still a great deal of work to do so that students' writing experiences are both standardized across the program and enriched by current research regarding effective computer-mediated instructional spaces—the college is moving to reorient classrooms by inverting the rooms from a teacher-at-the-helm (teacher-centered) design to a teacher-at-the-rudder (student-centered) layout. The space plan currently under consideration for implementation in four classrooms primary used for writing courses will change the space so that the teacher station is at the back of the room; all the student tables and computers face the projection screen; and the student tables are staggered in placement, for ease of sight and for ease of movement (e.g., so students can more easily work in pairs or small groups). This low-cost solution alters the dominant methodology of teacher-centeredness and opens spaces for other kinds of collaborating and coaching. I'm not advocating that this change will alter behavior; such a claim would be reductive and simplistic. But, as the LEED model points out, space and orientation do matter in that they establish the limits or boundaries for the activities that take place within a particular space. Site ecology (i.e., space and the way the space is structured) clearly both introduces and reinforces action.

Resources for Supporting Programs

In the LEED model, resource anchors the balance of investments and articulate a sensitivity to using both local and global means to reduce waste and enhance ownership. This part of the LEED system is highly detailed, and describes variables such as transportation of resources, resistance to products with high levels of embedded energy, and sensitivity to overall energy conservation. This portion of the LEED model asks about how construction elements are "owned" locally—rather than "resourced," "outsourced," and/or "over-sourced." In my application of the LEED model to the ways in which we assess and sustain a computers and writing program, I am particularly drawn to the notion of transportation, because it functions as a crossroads (far/near, us/them, and individual/global). Architects understand that not all materials can be local and they thus must rely upon large-scale movement of materials to a specific building site. The ideal situation is to rely locally upon those resources with the most embedded energy (highly produced or refined materials); realistically, other materials may come from a distance (natural resources, for example, like wood, aggregate, or sheetrock). Due to the many constraints relative to a specific site, a balance must be created.

For teachers of first-year writing, resource support considerations are ongoing. And questions about balancing the resource needs of a local department with the needs of others at the college level seem omnipresent: “To what extent are critical elements of a computers and writing program ‘outsourced’ to other departments?—or, "Does outsourcing of critical computers and writing elements jeopardize the technoecology?" In ICC’s writing program, for example, the need to compete for scarce resources is felt by each faculty member who calls the instructional technology help desk and is put in a queue, and by each student who sits down to a monitor that flickers or a mouse that doesn’t work. How do we get what we need quickly in the face of diverse demands, scarce resources, and competing departments? This question might best be addressed by approaching (as LEED does) each interaction as a partnership. The interactions I’m thinking about obviously include computers, wires, projectors, desks, servers, and course-management systems—these are the obvious resources to map in terms of interactions. Some less apparent elements include student testing and placement, as well as access to online writing labs and writing tutors. These need to be planned, negotiated, and implemented through partnerships with writing-invested local departments and with global, college-wide technology resource providers. Working as a member of a technology team helps break down barriers that are often in place, and that have solidified over years of institutional replication.

One such barrier is the outsourcing of assessment approaches, reported on in a recent collection on machine scoring of writing edited by Patricia Freitag Ericsson and Richard Haswell (2006); they dedicate three chapters to ACT’s E-Write program for placement purposes, two of which are chapters reporting on 2-year colleges. All three chapters conclude that the E-Write automated grading engine poorly scored student writing with sometimes unrecognizable discrimination (i.e., most papers received a similar, conservative score). William Ziegler (2006) concluded:

> However, writing faculty see placement through a lens that finds usefulness in the work of creating and maintaining a placement instrument. In addition to the honoring of placement values… conducting writing placement [as with E-Write] forces faculty to revisit vital questions: what are the basic skills of writing? What traits do we agree to recognize as demonstrating competence in these skills? For faculty, the work of placement may be a pearl-producing irritant; the answer to computerized testing may forever be “not yet.” (p. 146)

At Ziegler’s community college, it was the process of using a machine to test writing rather than the machine’s role per se that became the issue, raising the question of why writing programs might outsource such an important activity to separate testing offices. Shouldn’t we be looking for ways to maximize placement information through computer use from within the department, perhaps with home-grown tools, or tools customized to represent and evaluate what we consider key to writing?

ICC tested the same E-Write program during the pilot phase in 2003 for the same reasons as Ziegler’s institution did: The college wanted to collect a whole text or essay from students with a computer and then have it scored quickly and efficiently. During the process, something insightful happened with ICC’s link to this resource and ICC’s testing office in general: Faculty could access the written work of students after the grading machine finished its magic. Before or at the beginning of class, for instance, I could pull up student essays and verify placement scores, or apply an individual assessment rubric to determine the range of preparation and ability in the class. Colleagues were excited; rather than reduce a student essay to a digit, faculty could access an entire document to confirm a placement recommendation or to initially assess the quality of student writing. It was as if placement, which ICC’s department outsourced two decades ago, was returning front-and-central to the department, as faculty were again involved in addressing the questions Ziegler posed.

This is the sort of complex, multi-faceted partnership that a LEED-based analysis can reveal, I believe, because it addresses the people involved in needing and providing services, rather than the technology itself. I'd recommend that computers and writing advocates involve themselves as members of both department- and college-wide technology committees, grant-writing initiatives, and/or general education teams. Millward (2008) reinforced this point by identifying four patterns that work against effective and equitable resource allocation; these included:

- technology access disparities between campuses at multiple-sites institutions;
- faculty demand exceeding smart classrooms and computer classroom availability;
- computer classrooms or technical support dedicated for specific course levels only; and
- departmental policies that determine who is scheduled in technology-supported classrooms and which classes receive computer access, inevitably excluding certain groups (e.g., adjunct faculty, new faculty). (p. 382)

A recent teaching assignment at Florida International University illustrates these patterns, as my adjunct status made it almost impossible to guarantee computer support for my class. Although I sought out several options, it was only due to a last-minute cancellation that a computer classroom became available (Figure 7).

Figure 7. Florida International University computer classroom: Student view.

Millward's (2008) point about resources in first-year programs at 2-year colleges (and at 4-year colleges and universities, I'd argue) suggests that we need to get actively involved and to use whatever leverage is available to partner with power structures and administrators within our institutions. At ICC, for example, I served as chair to ICC's Technology Planning Committee, populated by a college-wide group of department representatives. In this position, I helped to shape current policy and future planning of hardware and software, and the distribution of those tools. I found these interactions rewarding, not because of any one success ICC's writing program has enjoyed, but because of the relationships I've built participating in ongoing, recursive technology planning.

AWARENESS THROUGH TRAINING

In the LEED model, awareness is the ability to optimize ongoing performance of agents and equipment—for example, using local professionals, challenging conventional views, and finding unnoticed efficiencies. As with any institutional effort, the process of awareness through training is ongoing and never finished. LEED relies upon workshops, government publications, and its Web site to help planners learn cutting-edge eco-conscious design. Specifically, their rating tool—Platinum, Gold, Silver, and Bronze—promotes the success of individual architects and/or organizations. To acquire certification, designers and builders must learn LEED's model and look for opportunities to implement it when building and when redeveloping. This last point is the contribution from LEED upon which I'd like to elaborate in this section. LEED is constantly evolving and "re-versioning" itself because of technological developments (like stronger structural insulated panels) and feedback from professionals in the field. The perspective LEED advocates in its green proposals continually looks for ways to triangulate products, which takes time, but is invaluable for professionals who use the system.

This process of keeping pace with developments while gathering stakeholder feedback as essential for a successful computers and writing program. And I think this we can borrow what Jay Bolter and Dave Grusin (1999) meant in terms of *immediacy*, *hypermediacy*, and *remediation*; certainly, these terms resonate more with computers and writing scholars than terms like "structural insulated panels." Bolter and Grusin noted:

> New digital media oscillate between immediacy and hypermediacy, between transparency and opacity. This oscillation is the key to understanding how a medium refashions its predecessors and other contemporary media. Although each medium promises to reform its predecessors by offering a more immediate and authentic experience, the promise of reform inevitably leads us to become aware of the new medium as a medium. (p. 19)

Bolter and Grusin are describing here a kind of awareness as they work through various media examples in their book; remediation is that *third* space between immediacy and remediation. This vision offers a methodology for seeking problems and solving dilemmas, and it finds a welcome audience among faculty searching out initiatives to enhance knowledge about teaching and learning with computers.

In applying LEED's notion of awareness to computers and writing, leaders might think first about the kinds of training needed for new and returning instructors, as well as workshop opportunities where training is strategic and critical. (Millward argues in her TYCA report that, although 86% of respondents reported some kind of pedagogical professional development for faculty, there were concerns that the training was "inadequate because of few or sporadic offerings" and "focused on technical aspects rather than pedagogy," p. 384.) A case in point: Institutions like ICC and UM rely heavily on two platforms for supporting instruction and learning: Turnitin.com and Blackboard. These systems function broadly in smart classrooms and online, thus forming the backdrop of most course-related digital writing exchanges. It is not my goal to critique either system fully, but I would like to point out how training in these platforms can be addressed by a LEED-inspired assessment, and reveal a transformative agenda for training faculty.

The first step for training at ICC is instruction on how to use Turnitin.com and Blackboard. But this sort of training is less useful than purposeful, rhetorical, critical thinking about how the tools might be used best. Both Turnitin.com and Blackboard have in their marketing promise the transformation of writing instruction, the former in terms of authenticity (or "originality") and the latter in terms of offering a closed (i.e., password-protected, nonpublic) course-management site. Most faculty think of Turnitin.com as anti-plagiarism software that addresses college administrators' need for a quick, politically responsible answer to the rising trend in student cheating and paper-download Web sites. The system works by a student or faculty member uploading a digital document, which is matched against the most recent version of the Web-docuverse available to Turnitin.com (although their search is not complete by any means, especially given that the system is not connected to peer-to-peer file-sharing sites running under the Web). Turnitin.com produces an “Originality Report” for the student writing—comparing how similar or dissimilar it is when compared to other sources indexed on the Web.

These kinds of network products may seem generally benign to many college professionals, especially in light of 4/4 or 5/5 teaching loads. But the point that can be made in the context of remediation is that professionals must oscillate between convenience and authenticity in the search for ways to critically resist the global, totalizing use of tools by paying attention to them as media; they need training about a third way. I’ve generally resisted the use of Turnitin.com in my classes not by ignoring it, but by transforming it into a learning tool for students. Rather than review originality reports, I ask students to post, collect, and analyze their own as part of the process for a particular project. In this way, the students become critical users of the programs and participate in the process of tool-based writing assessment. In every training opportunity for faculty to learn how to use Turnitin.com, I always point out that Turnitin.com can be used in this way, that is, against the intentionality promised by the system.

A second example of this LEED-inspired assessment is Blackboard. Perhaps because Blackboard represents a ubiquitous presence at most campuses—it is the only course-management software at the three institutions in which I’ve taught—careful critique and assessment is required. My own use of the software for peer-response pedagogy has continually brought about a desire to work against the platform while assessing global improvements. I have brought this evaluation-oriented attitude to many faculty training sessions. In brief, Blackboard only marginally invokes what I consider effective peer-response activities, ones that allow students to post works-in-progress, comment on these works, and receive feedback from peers about the usefulness of peer comments. In early versions of Blackboard, this process could be approximated through public sharing of student work in a threaded discussion forum or group list. More recent versions of Blackboard now include a rating feature that can be activated by teachers for this purpose, an option that, unfortunately, requires upgrading (Illinois Central College has yet to invest its resources in this way). The point here is that straightforward training in Blackboard eclipses peer-response goals in favor of simple transactions and layout features. Faculty require training in how to see the gaps among pedagogical possibilities and technical realities using the very platforms in which their classes operate.

As these examples show, faculty need more than general training with software and hardware; they need opportunities to see through the resources and allow their pedagogies to emerge along with or be transformed by their interactions. Scrutiny is required of all proprietary and open-source software; wired and wireless network access; student- and institution-owned computers; print journals and digital document indices—and on and on. LEED brings to computers and writing an assessment focus that investigates the most important resources of educational institutions: human–technology interactions. These interactions must be understood and critiqued to support a sustainable ecology for computers and writing programs in the coming decades.

ENGINEERING FOR LIFE-CYCLE REPLACEMENT

LEED takes a large-scale, all-encompassing view in terms of space and time, encouraging the analysis of a decision in the context of all other decisions, across the entire life of a project. The overall construction of site, resources, awareness, and design requires strong leadership, which I’d argue is the penultimate element required for sustainability. Leaders need to ask long-term questions to cultivate sustainability—questions not often in the forefront of writing teachers' minds in resource-competitive environments. Yet leaders must be progressive in contemplating how newly imagined spaces will function 10 years in the future, or how computer replacement will take place even as brand-new machines are selected.

This need to think broad-scale makes leadership the most important element of a successful computers and writing program. Sadly, at many 2-year colleges, no dedicated resources are available from year-to-year to support new faculty training or the continued professional development of existing faculty. In a study analyzing writing practices and writing support in 2-year colleges, Timothy Taylor (2007) found that only 17% of respondents had a writing program administrator. This probably means that alignment of elements—or what I'm calling leadership design—remains the job of a department administrator (i.e., chair, dean, or provost), or a professional who serves across departments. Taylor concluded by noting that "we still need a person, an expert, who can. . . improve working conditions in writing programs" (n.p.). Such a recommendation links 2-year colleges with organizations such as the Council of Writing Program Administrators, a source for position statements and resolutions coordination.[3]

Although four-year colleges and universities perhaps consider a WPA position a given, 2-year college programs that hire hundreds of adjunct and full-time faculty do not necessarily share in this view. The perception, rather, is that administration of writing belongs to the central administrative authority in a department, or is shared by faculty through release time. This makes it nearly impossible to address the enormous challenges facing the sustainability of a computer-supported program.

As an associate dean, I specifically asked for a new position to administer ICC's writing program and assist with technology training and supplements. I imagine that this coordinator, director, or WPA could offer:

- training for adjunct faulty members in site and resource utilization;
- reviewing of writing-program technology in classrooms;
- coordination of English Learning Lab (ELL) curriculum and software review;
- reviewing of software for developmental learning programs;
- coordination with the college's online writing/learning lab;
- training for student tutors in the online writing/learning lab;
- deploying a content-management system for all faculty and courses, and providing training for that system; and
- participating in department, college, and institutional committees to foster growth in all of the areas listed above.

[3] The Council of Writing Program Administrators is a national association of college and university faculty with professional responsibilities for (or interests in) directing writing programs. Members include directors of freshman composition, undergraduate writing, WAC/WID/CAC, and writing centers, as well as department chairs, division heads, deans, and so on. WPA publishes a journal and newsletter, holds an annual workshop and conference, makes grants and awards, develops position statements, offers consulting and program evaluation, and fosters extensive discussions about college writing and writing programs.

Indeed, every great LEED initiative requires a visionary—someone dedicated to the project and derives personal and professional satisfaction from moving it forward. For computers and writing programs in English or composition departments, this may be the coordinator or director of writing responsible for designing or redesigning writing sites and spaces, for exploring and evaluating computer resources, and for training and re-training faculty. This role, the person who fills it, and the strategic ways in which models like LEED are deployed are factors that cultivate and sustain continuity—a sustainable, healthy technoecology—across campuses, across semesters, across years, and across changes in technology.

LEEDING FOR THE FUTURE

ICC's program—and, indeed, all writing programs—require rigorous, balanced assessment. Too much computers and writing administration falls to generalists. A decade ago, my colleague and I bemoaned, with the help of Cynthia Selfe and Richard Selfe's scholarship, that we still depend upon access to generic infrastructure in regard to classroom design, faculty support, and resource allocation. We rely on universal, general, and often one-size-fits-all approaches to instructional technology rather than shaping a sustainable identity from within our department. In LEED terminology, 2-year colleges like ICC need a model for balancing the interests involved in sustaining quality over time.

The model I have articulated here (summarized in the list of questions included in the Appendix) connect the LEED principles to the work we can do to support and sustain healthy computers and writing ecologies at 2-year institutions. Clearly, the questions do not fit so tightly together as to impose a rigid point-numbering system for assessing site, resources, awareness, and leadership design. Rather, what I hope to have demonstrated through this tool is a specific heuristic. We need to re-think classrooms and practices at every turn, looking for opportunities to re-integrate, re-introduce, and reinforce an overall, sustainable approach to the technoecologies in which our computers and writing programs exist.

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Appendix. LEED-based assessment survey (also available at

School or Department Name: ___________________________________

1. What percent of composition courses are assigned to dedicated computer classrooms? (circle one)

   None 50% 75% 90% 100%

2. Using the four video samples (included with Figures 1–4), which computer classroom layout most resembles those at your institution? (circle one)

   None 214B 306A TC214 CC207

3. Which of the following are “owned” and not “outsourced” to other college departments? (select all that apply)

   None
   Course-management system
   Composing software
   New media software
   Department server

4. How many events does your department sponsor/plan for teaching faculty to use computer software/services critically? (circle one)

   None 1/year 1/term 1/month 1/week

5. Who administers the computers and writing program at your institution? (select one)

   No one
   Dean / Department Chair
   Director / Coordinator of Technology
   College-Wide Faculty Development Department
   Writing Program Administrator

6. Which statement best describes your department's planning with computers and writing? (select one)

    None

    Planning includes assigning classes

    Planning includes budgeting

    Planning includes organizing faculty development events

    Planning includes long-term strategy

7. Typically, faculty who teach writing include which in their conception: (select all that apply)

    Text   Links   Images   Sounds   Video

8. At your institution, training with hardware, networks, and software usually includes: (select all that apply)

    None

    College-wide workshops

    Professional conferences (NCTE, CCCC, CW)

    Special events (department workshops)

    Certification programs

9. In your department, what percent of faculty are comfortable and competent at teaching writing with technology? (circle one)

    None   50%   75%   90%   100%

10. In your department, the number of students typically assigned in a computers and writing class on the first day is: (circle one)

    30   25   20   16   12

CHAPTER	10
TITLE	Digital Studio as Method: Collaboratively Migrating Theses and Dissertations into the Technological Ecology of English Studies
AUTHORS	Jude Edminster Andrew Mara Kristine Blair
OVERVIEW	In this chapter, we address the role of English studies in developing and sustaining technological ecologies from the vantage point of a university pilot project to develop a new node in our institution's ecology: a digital collection of electronic theses and dissertations (ETDs). As part of this process, we discuss a co-authored and co-administered grant for a "Digital Literacy and Communication Studio," a design, development, and testing environment primarily for graduate students engaged in developing ETDs as part of e-portfolios to enhance their scholarly research and professional profiles. We enumerate ways that intra-departmental training and cyberstudio practices helped us challenge limiting cultural and institutional assumptions about knowledge creation and delivery within English studies. We focus on the specific case study of our institution's ETD pilot project, a project that initially seemed to unify programs within the English Department with the Graduate College, but instead ultimately led to divergence over different conceptions of what an ETD is or can be with multimedia components and amplified archival and retrieval capabilities. Finally, we outline how our Digital Studio "intervention" both succeeded and failed in re-articulating English studies' role in our institution's technological ecology.
TAGS	Andrew Mara, articulation, BGSU, Bowling Green State University, collaborat*, creative writing, digital studio, dissertation*, ecology, electronic dissertations, electronic theses, English departments, e-portfolio, ETD, graduate, institutional critique, institutional formation, Jude Edminister, Kristine Blair, multimedia, Ohio Learning Network, OLN, online, rhetoric, sustain*, technical communication, technolog*, theses, writing
AUTHOR BIOGRAPHIES	Jude Edminster is an associate professor in the Scientific and Technical Writing Program of the English Department at Bowling Green State University and coordinator of the program's Online Graduate Certificate in International Scientific and Technical Communication. Edminster has published articles and book chapters in *Computers and Composition*, *Technology in English Studies: Innovative Professional Paths* (Inman and Hewett, Eds.; Lawrence Erlbaum Associates, 2005) and *Composing and Revising the Professional / Technical Writing Program* (Franke and Reid; Parlour Press, forthcoming). Her work in progress includes qualitative field research on the evolving genres of digital geology field notebooks (GeoPads), electronic multimedia dissertations (ETDs), and most recently, government-mandated electronic medical records (EMR). More about Edminster's work can be viewed at http://personal.bgsu.edu/~jedmins. Kristine Blair is professor and chair of the Department of English at Bowling Green State University, where she has taught undergraduate courses in classroom technologies and language arts, and fully online writing courses for adult learners. Blair has also taught doctoral-level courses in computer-mediated writing theory, research methodologies, and online pedagogies. The author of numerous publications on gender and technology, electronic portfolios, the politics of online communication, and cultural studies pedagogies, she currently serves as editor of the journal *Computers and Composition Online*. In 2007, Blair received the Technology

	Innovator Award from the Conference on College Composition and Communication's Committee on Computers and Composition. Her most recent project is the co-edited *Webbing Cyberfeminist Practice: Communities, Pedagogies, and Social Action* (Hampton Press, 2008), and she currently directs a computer camp for girls in grades 6–8 titled “The Digital Mirror.” Andrew Mara is an assistant professor at North Dakota State University, where he teaches technical and professional writing, rhetoric, and nineteenth-century American literature. Mara’s research and teaching centers upon a concern with institutional innovation and investigates the convergence of writing practices, institutional design, and community. He has contributed articles to *Technical Communication Quarterly*, the *Journal of Business and Technical Communication*, *IEEE Transactions in Professional Communication*, and *Academe*, as well as several essays for collections. He is currently editing a special issue on posthuman rhetorics and technical communication for *Technical Communication Quarterly* and is working on a book-length manuscript on posthuman desire and rhetorical invention. In an earlier life, he was a technical communicator at Sandia National Laboratories.
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Digital Studio as Method: Collaboratively Migrating Theses and Dissertations into the Technological Ecology of English Studies

Jude Edminster
Andrew Mara
Kristine Blair

Karen Fitts and William B. Lalicker's (2004) recent “Invisible Hands: A Manifesto to Resolve Institutional and Curricular Hierarchy in English Studies” documented how a wide range of English Studies publications describe the “crisis in English.” English luminaries as various as Michael Bérubé and Cary Nelson (1995); Sharon Crowley, Linda Roberson, and Frank Lentricchia (1987); Nelson (1997); James Porter, Patricia Sullivan, Stuart Blythe, Jeff Grabill, and Libby Miles (2000); Bill Readings (1996); Susan Romano and Virginia Anderson (2005); and Robert Scholes (1998) have all detailed circumstances that pressure English departments to re-think the disciplinary formations that traditionally permit English scholars to continue their work. For example, in their overview of various aspects of “crisis” rhetoric, Fitts and Lalicker cited the “more amorphous and deeper cultural changes in literacy resulting from the displacement of print by electronically produced visual media” (p. 427). Undoubtedly, English Studies is under great pressure—philosophical, cultural, and technological—to reframe itself. One way to engage in this reframing is to explore how English Studies might contribute to developing new nodes and relations within institutional technological ecologies—including the formation and population of digital repositories and archives that redefine what it means to conduct and disseminate research, for current faculty and graduate students as future faculty—while continuing to preserve the academic values and objectives that shape and sustain our individual programs and larger institutions.

In this chapter, we address the role of English Studies in developing and sustaining such technological ecologies from the vantage point of two graduate programs engaged in a university pilot project to develop a new node in our institution’s ecology: a digital collection of electronic theses and dissertations (ETDs). Faculty and graduate students in our Rhetoric and Writing Program and Scientific and Technical Communication Program at Bowling Green State University employed strategies for developing ETDs that combined cultural studies and rhetorical approaches of articulation theory and institutional critique to rearticulate our departmental programs in ways we hoped would help faculty and graduate students craft spatial, organizational, and material remedies to challenges we faced in transforming print theses and dissertations into ETDs. As part of this process, we co-authored and co-administered a grant for a Digital Literacy and Communication Studio (DLCS), a design, development, and testing environment primarily for graduate students developing ETDs. In this chapter, we also enumerate ways that intra-departmental training and cyberstudio practices helped us challenge cultural and institutional assumptions about knowledge creation and delivery within English Studies. We focus on the specific case study of our institution’s ETD pilot project, a project that initially seemed to unify programs in the English Department with the Graduate College, but instead ultimately led to divergences over differing conceptions of what ETDs are or could be, with their multimedia components and amplified archival and retrieval capabilities. Outlining how our Digital Studio intervention both succeeded and failed in re-articulating English Studies’ role in our institution’s technological ecology, we acknowledge how our efforts may have deepened ideological boundaries that delineate conceptions of authorship and that seem to differentiate programs within English Studies. Finally, we pose some preliminary answers to the following questions: What happens when ETDs, as a new variable in an existing technological ecology, change the social dynamics of that ecology?

Furthermore, how can these dynamic ecological relations be sustained, while at the same time remaining open and responsive to change? How do our own efforts to create an educational space within our English Department help to foster and ultimately sustain ETDs as an emerging research genre?

CONCEIVING THE STUDIO IN RESPONSE TO INSTITUTIONAL CHALLENGES

Our Graduate College acknowledged the power of open access to research and information exchange that ETDs provide, and in 2004 created an Ad Hoc ETD Committee on which two of us participated as subject experts and graduate educators. After a year of reviewing university policies on ETDs, formatting guidelines, and deposit procedures, our university-wide committee recommended that several departments participate in electronic submission to the OhioLink ETD Center during the 2004–2005 academic year. Backed by this pilot ETD program, a rhetoric doctoral student submitted the department's first ETD in early November 2004, and based on that successful first submission and others that followed in that pilot year, electronic submission is now mandatory on our campus. The decision to form the Digital Literacy and Communication Studio (DLCS) resulted as much from institutional pressures and the new ETD initiative as from our common goals for graduate students in our programs. Not unlike other departmental initiatives, the studio was in part a direct response to our university's development of an academic plan that included among its long-term priorities the improvement of graduate education and the increased integration of new and emerging technologies. In a department meeting at which each program was asked to share its written response to the plan, we noted similarities between an existing educational technology assistance program in Rhetoric and Writing titled the Digital Language and Literacy program, and a growing interest in exploring the benefits of electronic theses and dissertations within the Scientific and Technical Communication program, suggesting an opportunity for collaboration across the programs. From the discussion at the departmental meeting, the two writing programs decided to rename and slightly refocus the Digital Language and Literacy initiative, renaming it the Digital Literacy and Communication Studio (DLCS).

To foster multimodal literacy acquisition, the DLCS serves as a meeting space in one of the Department's networked writing labs, with evening workshops for graduate students and faculty in the English Department. Initially, the studio focused on three specific components:

(1) development of online curricula, including a fully online graduate certificate in International Scientific and Technical Communication (designed for professional domestic and international audiences), and a fully online master's program aimed at public school teachers, particularly those working in language arts in Northwest Ohio;

(2) a graduate-level e-portfolio initiative to help master's and doctoral students develop digital technology skills vital to their professional development and marketing success; and

(3) the pilot project introducing electronic theses and dissertations (ETDs) to our campus, thereby helping students better prepare to integrate the newest literacy technologies into their scholarship.

As we outline later in the chapter, a number of professional development forums, both face-to-face and online, have helped to develop and sustain these components. Overall, these Studio components presume the importance of educating students and colleagues about the ways technology impacts language, literacy, and communication practices and are thus a vital part of redefining graduate education and faculty development in digital teaching and research. For the purposes of our chapter, however, we focus on the third component, the ETD initiative, as a case study of the successes and challenges of sustaining technological ecologies.

The opportunity to merge our two programs' common interests through the DLCS was also enhanced by a request for proposals from the Ohio Learning Network (OLN), the state's academic resource clearinghouse on teaching and learning with technology and distance learning. In May 2004, we were awarded a $20,000 learning community grant to establish the studio as an in-house technology and professional development program for faculty and graduate students in the department. The grant offered us the opportunity to create an imaginative framework and build material support (in the form of funded graduate student assistance, travel reimbursement, and faculty salaries) to host cross-program meetings and technological training forums. Equally important, the grant also allowed us as faculty from Rhetoric and Writing and Scientific and Technical Communication to work together to perform what Jay David Bolter and Richard Grusin (1999) have termed *remediation*—the process by which older and newer media are aligned to create new media forms and to remedy perceived shortcomings of older forms of expression. In this case, our grant provided the opportunity to remediate a traditional and central genre in the genre ecology of English departments—the print thesis or dissertation. Indeed, for scholars such as Clay Spinuzzi (2004), "genre ecologies are constantly importing, hybridizing, and evolving genres (and occasionally discarding them), and these dynamic changes in a genre ecology tend to change the entire activity" (online). The proposed migration of this traditional print text into the emerging technological ecology of our institution provided the department with an opportunity to play an important role in re-shaping the research and writing practices of future English faculty, shifting toward a more socially constructed view of the technological literacy practices that impact professional identity. We see the development of such an identity as key to sustaining both departmental and institutional technological ecologies while remediating a longstanding print genre.

To encourage graduate students and faculty to adopt new roles in our technological ecology, the Studio's major focus became promoting and directing the English Department's participation in our institution's ETD pilot program, in which English was one of three university departments to have students submit their theses and dissertations electronically to the OhioLink ETD Center. We saw ETDs as an opportunity to enhance the teaching of technological literacy not only as a set of skills that fall within the purview of particular programs, but also as a means to help graduate students and faculty join the technologically literate community of scholars and teachers across the university who participate, relate, and share information in our institution's technological ecology. With funds from the OLN grant, the digital studio provided training and guidance that enabled faculty and students to redefine their professional situations and identities by using technology to enhance the composition and presentation of their research through electronic publication of dissertations and scholarly articles. ETDs are currently transforming the information ecologies of institutions worldwide, and we felt it is particularly important that graduate education and graduate students themselves become part of the social network of our institution's information ecology.

CROSSING INSTITUTIONAL BOUNDARIES

The development of ETDs challenges traditional institutional boundaries in a number of ways, redefining the role of the scholar and also the impact of scholarship on the discipline through a philosophy of open, shared access to information. Moreover, the composition of ETDs suggests a more interactive, multimodal, and multivocal collaboration that moves away from the traditional forms of single-authored, print scholarship valued within English departments toward genres more social than individual, and that rely on a range of digital modes and means.

ETD collections at institutions such as the Miguel de Cervantes Library, which holds dissertations that incorporate continuing scholarly commentary, provide spaces where researchers can asynchronously interact through electronic postings, reducing the tension between "centripetal social needs, which call people together. . . [and the] centrifugal technologies that allow them to move apart" (Brown & Duguid, 2002, p. xix). These libraries and other forms of digital repositories demonstrate "the power of technology to create and deploy social networks" (p. xvii). However, as expanding electronic texts, they need not, as Brown and Duguid feared, "distract attention from the richer social roles that [paper] documents play" (p. xix). Conversely, as Bonnie A. Nardi and Vicki O'Day (1999) noted, "A diverse information ecology is a lively, human, intensely social place, even if it incorporates very advanced technologies" (p. 52). ETDs that incorporate scholarly commentary can form key nodes in technological ecologies, which afford increased participation in socially networked research and scholarship.

At our own institution, there have been successes and challenges to ETD implementation. While we have had success in moving to electronic filing, we have also experienced barriers typical to the sustainability of technological ecologies within the academy. For instance, although it is indeed possible to create and submit multimedia projects within the required portable document format (PDF), ETDs have been primarily word-processed documents converted to PDF with little if any multimedia component. This is due in part to the typical constraints upon technological integration, including an ecological phenomenon in which university policy about the range of file formats possible is far behind the composing affordances available across software applications, not to mention the all-too-common gap between technological access and training in multimodal literacy practices among faculty, who set the policies, and graduate students, who are actually composing the ETDs. Perhaps an even greater variable, however, is the ever-present privileging of the dissertation as an alphabetic text—an academic value judgment that without further institutional critique and articulation will continue to prevail. For example, during initial planning, we encountered heavy resistance to the suggestion that an alternative set of document format guidelines needed to be developed for multimedia ETDs; the existing guidelines were developed for print documents, and would be of limited use when students chose more innovative approaches to presenting their research. This suggestion was rejected, based on the belief that multimedia ETDs would be the exception rather than the rule, and that they could be evaluated on an ad hoc basis. We felt that the absence of such guidelines would discourage students from using multimedia because the perceived risk of submitting their work to be checked on an ad hoc basis by a single member of the Graduate College staff would be too high.

After browsing our institution's current ETD collection, we found static images, digital photos, and full-color graphics either embedded in and (more often) appended to the text, but no video, animation, or sound files. Music performance master's theses contained pages and pages of silent musical score, which admittedly may be quite meaningful in an educational context, but the document might become much richer and more appreciable to a global online audience if sound files were included along with the score. Clearly, by not having alternative options available, students and their faculty committees were reticent to explore the possibilities multimedia have to offer in presenting the results of their research. Developing and adopting a set of multimedia ETD format and presentation guidelines that can be applied across departments would reduce uncertainty and encourage innovation among students and faculty mentors. Without such guidelines, the sustainability of digital, multimodal work is hampered.

We also encountered barriers to the sustainability of global access to ETDs during early planning when representatives from the ETD Committee met with the Graduate Student Council to respond to their concerns. Many were confused about copyright and prior publication issues; thus, our ETD Committee Report (2004) to the Graduate Council included the following paragraph:

> As has always been the case with print theses and dissertations, copyright remains with the author of the work. This does not change with ETDs. In addition, OhioLINK allows delayed submission for patent application and pending publication, when delayed submission is warranted. Some students submit abstracts only for a limited period of time, e.g. one year, during which time the full text ETD resides in the Graduate College in digital form. The University of Cincinnati hosts an Academic Journal Policy Database at its web site to assist students with questions about individual publishers regarding prior publication. (p. 2)

As we discuss below, despite our assurances of copyright protection, many graduate students and faculty committees still had concerns.

DIGITAL STUDIO FORMATION AS INSTITUTIONAL CRITIQUE AND ARTICULATION

Digital Studio as Institutional Critique

The project of migrating texts into sustainable technological ecologies at departmental, institutional, and inter-institutional levels inevitably shifts the dynamics of players within and across ecologies, subverting established academic values within both departmental and university-wide communities. One way to integrate faculty concerns over retaining these values while simultaneously working toward developing sustainable technological ecologies is to engage in the process of institutional critique. James Porter and his colleagues (2000) described a particular manifestation of this; according to Porter et al., the aim of institutional critique is to sensitize institutions to those who use them from within, so that the conditions of those they serve are improved. Institutional critique, they claimed, constitutes:

> a method that insists that institutions, as unchangeable as they may seem (and, indeed, often are), do contain spaces for reflection, resistance, revision, and productive action. This method insists that sometimes individuals (writing teachers, researchers, writers, students, citizens) can rewrite institutions through rhetorical action. (p. 613)

The writing space of the dissertation, both as a print document and as an ETD, is an institutional space for reflection on the value of graduate student research within the technological ecology of the university. Questions of purpose, audience, value to the scholarly community, and accessibility need to be addressed as the genre evolves within social and institutional networks. ETDs present rhetorical possibilities, such as the use of multimedia and hypertext, which can be used to argue for their own adoption. We feel the dissertation is also an example of what Porter et al. called “a local manifestation of more general social relations, nodal points in the rhetorical relationships between general social. . . processes and local practices” (p. 621). An ETD is a nodal point in the web of relations among disciplines, graduate programs, students, faculty, libraries, and the larger scholarly community.

An ETD is itself an example of institutional critique in that writers of ETDs enact alternative practices. By submitting an electronic document, ETD writers submit a text that embodies an institutional change in the content and format of the traditional print dissertation; at the same time, the text argues for such change. Similar to the institutional critique that Porter et al. called for, an ETD links “macro-level systems and more visible local spaces” (p. 621) through the demands that an electronic artifact exacts upon material practices. Electronic documents require a large assortment of material production and reception changes in what were formerly settled arrangements of personnel, practices, and spaces. Long effaced and typically hidden textual sustainability practices—the isolated student, word processing in an apartment; the dissertation committee member, demanding a particular bibliographic citation style in a committee meeting; the underpaid college proofreader, pouring over a dissertation near deadline—all re-circulate and become contested sites as the issue of sustainability morphs from textual conventions into the new electrate and multimedia practices possible in ETDs.

As the space where faculty and graduate students met to work on ETDs, the Digital Literacy and Communication Studio became for us a form of institutional critique. Our Rhetoric and Writing and Scientific and Technical Communication programs used the DLCS grant to critique the limited extent to which programs within our English department acknowledge the impact of multimodal literacies on the production and distribution of scholarly information and the impact on the professional development of both current and future faculty. Very similar to the difficulties faculty development units and corporate training experts face in meeting the needs of a busy, overworked clientele, we had to establish a diverse model of professional development activities, both virtual and face-to-face. Based on several orientation- and need-assessment approaches, we developed three professional development forums:

(1) a hands-on workshop series titled "Evenings at the Studio," featuring sessions on developing online pedagogies, Web design and usability, digital imaging, and video editing for use in ETDs and digital portfolios;

(2) a house-call program where advanced graduate students meet in the offices of faculty and fellow graduate students to provide one-to-one technological consultation; and

(3) a virtual professional development resource offered through a Blackboard course in which all English faculty and graduate students are enrolled, allowing them access to links and resources related to ETDs and other aspects of digital production.

These development forums are, we believe, crucial to sustaining ETDs as a working and usable node in our institution's technological ecology. For graduate students and faculty mentors, these approaches represent an institutional commitment to ensuring that new scholars know how to compose ETDs, and seasoned scholars know how to use them as tools of evaluating student research and writing skills.

Thesis and dissertation writers and their faculty advisors should have the opportunity to both theoretically and practically explore the extent to which various digital components of an ETD—for example, hyperlinks, images, video, and audio—are part of the data collection and representation process, thus contributing to knowledge construction and dissemination within the discipline. Admittedly, the limited technological knowledge and privileging of alphabetic literacy on the part of many faculty can limit the role of ETDs and other digital genres to little more than word-processing documents saved as PDF; yet, as Debra Journet (2007) chronicled, her experiences as a participant in the Digital Media and Composition Institute at Ohio State University and similar opportunities on her home campus (the University of Louisville) not only impacted her teaching and research, but also have allowed her to better acknowledge the need for digital literacy acquisition among senior colleagues, as well as among graduate and undergraduate students. As a result of her growing expertise in digital media, Journet suggested that her experience "can suggest productive avenues of conversation. . . with senior colleagues who are intrigued with multimodality" but who are concerned about switching from expert to learner and locating opportunities for professional development. Journet ultimately called for senior faculty to "not just leave digital media to the 'new kids'" (p. 108), but to be involved in shaping the role digital media play in teaching and research. Spaces and programs enabled by such spaces as the Digital Studio can serve as important catalysts for faculty re-invention.

Digital Studio as Articulation

A space such as the DLCS is an application of articulation theory—the key cultural studies method for intervening in material and discursive formations. Here, articulation theory helps us to continually remediate what, where, and how we conduct research, and why we make choices in the interest of enhancing our departmental role in growing and sustaining our institution's technological ecology through ETDs. Articulation theory, as Stuart Hall described in an interview with Lawrence Grossberg (1996), allows for temporary and advantageous connections between seemingly different elements:

> An articulation is. . . the form of the connection that can be made between two different elements, under certain conditions. It is a linkage that is not necessary, determined, absolute and essential for all time. You have to ask, under what circumstances can a connection be forged or made? (p. 141)

More recently, in *Datacloud* (2005), Johndan Johnson-Eilola built upon Stuart Hall's use of articulation theory to carefully describe how articulation resists the two poles of environmental determinism and postmodern randomness:

> So while people are routinely constructed as ideological subjects without their noticing it, networks of social forces are never completely tied up; there are always little border skirmishes, forces pushing in opposing directions. . . While we do not frequently pay attention to these ongoing ideological conflicts, they are always present. Ideologies are structured like languages, always open to shifting in the ways that words shift from context to context and over time. And, like language, words cannot be simply redefined arbitrarily (particularly in larger communities). (p. 37)

The DLCS emphasis on ETD production has allowed us to explore and publicly discuss a need for curricular changes in our own program that other English Departments have initiated—North Carolina State's Communication, Rhetoric, and Digital Media PhD, the University of Central Florida's Texts and Technology PhD program, and Texas Tech's MA in Technical Communication Online and more recent online PhD, to name but a few—and the possibility that we might steer our department in similar directions. Such articulations also include Morgan Gresham and Kathleen Blake Yancey's (2004) discussion of the Pearce Center for Professional Communication at Clemson University; in their profile of "new studio composition" they addressed the linkages between physical, electronic, and curricular spaces to foreground "a model of pedagogy centered on learners immersed in communication rich tasks" (p. 9). Similarly, the DLCS foregrounds a space for faculty and students across the department to, as Gresham and Yancey contended, articulate their existing conceptions of literacy, and through collaboration and shared expertise among students and faculty, expand those conceptions. In our case, the DLCS enables rather than constrains the ways in which digital writing and research, particularly through ETDs, shape emerging technological ecologies.

Localizing the Potential of Electronic Theses and Dissertations

Locally, both the Rhetoric and Writing program and the Scientific and Technical Communication program value and teach a range of digital literacies, including interactive and multimodal collaborative writing. These values and teaching strategies link our two programs in ways that have allowed us to collaborate via the DLCS to provide design and technical support for graduate students writing ETDs. Although the majority of submissions from our department have been limited to basic file format conversions from Microsoft Word to PDF, we believe the shift to electronic submission will further our curricular efforts by creating exigency and opportunity for multimodal literacy on the traditional research, data collection, and data representation processes in graduate-level research in English Studies. Overall, this shift will continue to create more of a shared responsibility between graduate student committees and the students themselves as they dialogue about the multimodal possibilities of ETDs.

But resistance to these multimodal possibilities and other benefits of ETDs arose almost immediately from the English Department's strongest program, Creative Writing. The privileging of single authorship that drives the Creative Writing program at Bowling Green foregrounds the opposing position that writing is socially constructed and always a public act. The Digital Studio has continued to provide a space for conversations concerning these issues, including how they conflict with or support the responsibility public universities have to make the knowledge and creative artifacts they produce publicly accessible.

When members of the DLCS involved in the campus ETD initiative volunteered the English Department to participate in the pilot program, resistance to placing Creative Writing student master's theses—which are original literary works—on the Web was immediate. Concerns included preserving authors' first rights to publication for any Web-based distribution and circumventing the "first publication" rights of publishers who might refuse to publish an author's work that appeared on the Web as an ETD. This concern continued as the success of the pilot project led to mandatory submission of ETDs across campus. The Creative Writing faculty in our department did an exhaustive study to prove that, as they claimed, literary presses and agents did indeed expect publishing poets and fiction writers to award first publication rights. Although this argument was compelling and accurate, it was not completely sufficient to sway our Graduate College, who continued to claim that because the MFA thesis was part of the degree program, it was considered public and not subject to permanent delay on release. Nevertheless, an initial compromise was made by the Graduate College to allow Creative Writing MFA students to delay public dissemination of their work for up to 5 years, a timeframe that continued to be a challenge for our creative writing faculty, who claimed that the rigors of literary publishing from revision to publication often extend beyond the 5-year point. Indeed, for our colleagues in this area, any public dissemination jeopardized the professional success of students and the national reputation of the Creative Writing program. Both the English Department and the Graduate College offered suggestions that included password protection and a move from a "thesis" to "project" model that would allow for private storage as opposed to online distribution, yet these options were perceived to negatively impact both student recruitment, publication, and eventual job placement. As a result, the program has since received an exemption from digital deposit to the OhioLink ETD Center, in part because of mobilization by the graduate students themselves and the larger endorsement of the Association of Writers and Writing Programs (AWP).

Given the connection between literary production and traditional paradigms of individual creative genius—despite the heavy emphasis on a workshop model within creative writing pedagogy—it is no surprise that these paradigms would directly oppose more social, communal aspects of textual production. In this sense, ideologies of academic and literary publishing, including presumptions about intellectual property, have not caught up with the technologies that can distribute or diffuse innovation in both scholarly and creative forms. Rather than unifying the English Department as we originally intended, ETDs, and the Studio's promotion of ETD production, admittedly reinscribed some of the ideological differences among our programs. This experience highlights the need for us to take seriously how academic philosophy, pedagogy, and values impact the migration of texts into digital ecologies. Moreover, the question must be asked: How does the addition of ETDs as a new variable in an existing ecology change the social dynamics of that ecology? What follows are some of the answers we found.

SUSTAINING ELECTRONIC THESES AND DISSERTATIONS

ETDs are both a technological and an organizational innovation. As a technological innovation, they may redefine the content, structure, or audience of the traditional print dissertation; as an organizational innovation, they may redefine faculty, student, graduate school, and library perceptions of graduate student research and the purposes it serves within the information ecology of the university. As Nardi and O'Day (1999) noted, "an information ecology is marked by strong interrelationships and dependencies among its different parts" (p. 51). The activities of faculty, students, graduate schools, and librarians complement one another, and the technologies they use extend their work at the same time they increase their dependence on one another. Moreover, the adoption of new technologies can create profound uncertainty among users. For example, the inclusion of content in visual and/or audio form, the use of hyperlinks to provide alternative reading structures, and the potential broad accessibility of ETDs are all features typically not associated with the writing of dissertations, which have for many years been almost exclusively text-based.

As universities accept the challenge of accommodating students who choose to write ETDs—with content, structure, and audience choices previously unavailable to seasoned faculty—roles and relationships in the existing ecology will shift. For Nardi and O'Day (1999), "change in an ecology is systemic. When one element is changed, effects can be felt throughout the whole system" (p. 51). With the advent of ETDs, traditional faculty–student mentoring relationships may transform; students may achieve earlier notoriety within their fields; graduate schools will be faced with creating new standards for the presentation of research documents; programs may experience new and increased visibility; libraries will be charged with creating digital collections that showcase production of new research. Established norms within the existing information ecology may appear to be challenged, and indeed, "local changes can disappear without a trace if they are incompatible with the rest of the system" (Nardi & O'Day, p. 51).

As we have mentioned, representation of dissertation research as text has become a well-established norm within the academic community. Faculty mentors are familiar with it as a genre, because most were required to write one themselves, and they are generally comfortable in evaluating its effectiveness as a research report. However, most are not familiar with multimedia ETDs. Alternative structures and non-textual elements require changes in the evaluation process—changes that faculty at universities who already accept multimedia work from graduate students have only just begun to explore. Mentors may find themselves called upon to become students themselves as they follow and learn from doctoral candidates' attempts to include new content and structure in their work. This shift may be perceived by many faculty to be incompatible with established mentor–mentee norms within the university. Established norms governing the processing and archiving of dissertations will be challenged by the advent of ETDs. Graduate school standards for the presentation of dissertation research are all based on the assumption that dissertations exist in print. Formats for the appearance of these documents include requirements for content, organization, headings and subheadings, text font and size, line spacing, margins, page numbering, and references—all of which may not be appropriate outside of print text. Online, the writing space can evolve in nonlinear and visual ways that cannot be depicted within one-inch margins.

Understanding how academic norms and values are affected by the addition of ETDs to an institution's technological ecology is key to the survival of this new information species as it continues to evolve. ETDs have clearly located an available ecological niche—the need for amplified access to cutting-edge research. However, for Nardi and O'Day (1999), "the social and technical aspects of an environment *coevolve*. People's activities and tools adjust and are adjusted in relation to each other, always attempting and never achieving a perfect fit" (p. 53). Thus we believe that the co-evolution of relations among students, faculty, research communities, libraries, and emerging technologies is required to sustain ETDs in their newly acquired ecological niche, notwithstanding the likelihood of an imperfect fit in the early stages of migration. One way we encouraged the co-evolution of faculty roles with emerging technologies designed to facilitate dissertation committee reviews was to invite Adobe's Education Specialist, Ali Hanyaloglu (2005), to deliver a presentation for our graduate faculty entitled: "Moving Beyond PDF Creation for ETDs." As Hanyaloglu noted, "Adobe PDF isn't just a useful electronic document format for submitting and viewing ETDs." His presentation demonstrated how the full potential of ETDs can be realized when PDF-creation software is used for the creation, preparation, review, and submission of research.

As we have also noted, the vast majority of ETDs originate as word-processing documents which, when reviewed by the student's committee and completed, are converted and submitted to graduate colleges as a PDF. Multimedia students include in the presentation of their research are typically appended as separate files, and thus are not presented (or considered) as part of the "real" dissertation, which is usually exclusively text. However, as Hanyaloglu (2005) demonstrated, multimedia ETDs can be created in PDF, which allows multimedia files to be quickly and easily embedded directly into the document. Moreover, the software's review and commenting capabilities can streamline faculty workflows and simplify collaboration among a student's committee members. We see a great deal of value in migrating faculty dissertation review workflows from print to digital. In the interest of further developing and maintaining the technological ecologies of both institutions and disciplinary research communities, dissertation committee work can and should co-evolve with the technical evolution of graduate student research presented as ETDs. To date, however, this workflow shift has not occurred in as systematic a way as we would have hoped, given that the ETD requirement is now 3 years old. We acknowledge that for some institutions, Adobe Acrobat Professional software may prove too costly for campus-wide availability. However, perceived limitations seem to be more ideological rather than technological in that a number of digital tools, from Google docs to wikis space and even local area networked server space can accommodate a digital-format approach. Another limiting factor is time, both in terms of faculty workload and graduate student time constraints; indeed, many graduate students are under pressure just to get "done" in time to graduate and take on their new roles as faculty, and, under such pressure, emphasis on digital media is often deferred indefinitely. For that reason, it is important to consider both faculty and graduate student professional development early in the dissertation process, providing the same type of training as, for instance, is provided to individuals seeking human subjects clearance (committee chairs and students must both be certified at BGSU), or other tools and resources, including statistical consultation and other forms of research support. Although we have attempted to provide such support within the context of the DLCS, such forums can and should also be part of the Graduate College; two of our authors have developed a workshop now being offered by the Graduate College staff.

CONCLUSIONS

Although it has not historically been viewed as such, the dissertation genre is an important space in the writing of professional identity. Within the university, the dissertation inscribes the identities of disciplines, departments, programs, graduate students, and faculty mentors. Changes in the dissertation, such as those ETDs make possible, will elicit changes in these various identities—changes consonant with the literacy required to participate in and sustain dynamic technological ecologies. We have come to regard ETDs as a nodal point in the web of relations among disciplines, graduate programs, students, faculty, libraries, and the larger scholarly community—relations which, along with the texts that they inscribe and are inscribed by, are rapidly migrating to new spaces currently being mapped within expanding, multimodal technological ecologies. English Studies can and should play a leading role in educating graduate students to actively participate in this migration by designing ETDs that integrate text with multimedia objects in rhetorically effective ways.

As we have experienced, it is clear that the preparation of future faculty to use the new and emerging technologies of literacy—which will allow them to participate in populating the digital repositories of research and information rapidly being explored by universities and other research institutions at the global level—can and should be a collaborative, shared mission. With such reciprocity in mind, we offer the following recommendations and caveats for other programs and departments attempting to implement and sustain similar technological initiatives:

- Despite our call for multimodal features within ETDS, we recognize the need to treat technoliteracy acquisition as progressive. Not doing so can scare students and their committees; the perception may be that they must suddenly do more than workload, time, or skill sets allow, thus discouraging experimentation with viable multimodal possibilities.
- To explore such possibilities, students must have access to a range of ETD models, including those in PDF and HTML/XML, and those including a range of multimodal features embedded within the text, including video and audio.
- Part of the training process must include training about copyright and fair use, something often missing from most functional literacy acquisition opportunities.
- Because one of our greatest barriers to enhancing possibilities for ETDs is the Graduate College, which holds to a PDF-only model, faculty and graduate students must advocate for a range of formats through standard governance forums, including Graduate Student Senates and Graduate Councils. We continue to experience difficulty with our own Graduate College, which views the ETD more as a financial convenience and storage solution as opposed to an opportunity to employ multimodal research methods that contribute to shifts in digital scholarly publishing.
- For research to genuinely benefit from multimodality, it is vital to remember that technology must not be included for its own sake but for its contribution to research, data collection, and data representation. For this reason, dissertation chairs and committee members must be part of departmental and university forums about the shifts in literacy and professional development planning for both writing and reading digital research. These conversations should take place within the context of graduate programs as well, within seminars (particularly in research methods courses), as well as in other professional development colloquia.
- As with any professional development initiative involving technology, quality training depends on a range of formats: whole group, one-on-one, theoretical and applied, and post-training resources, including online tutorials and examples. We have had success with graduate students serving as consultants to others just beginning work with multimodal texts, either by showcasing their work or providing some basic tutoring with some applications.

Initiatives—in our case the Digital Literacy and Communication Studio—strengthen the position of non-literary programs such as ours in more traditional departments of English, and also shape the future of English Studies as a valuable contributor to the migration of texts, as well as the preservation of philosophies and values that contribute to the ecological sustainability of digital repositories. It will be increasingly important for us to consider the role that combined spaces—physical and virtual—will play in sustaining a local technological ecology in which we can train future faculty and workplace professionals in the design and delivery of digital writing research.

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Introduction to Section III
"Sustaining Writing Centers, Research Centers, and Community Programs"

Innovative teams of colleagues in English studies have frequently spun off a number of important, diverse, and widely accepted programs in higher education. In section three, *Sustaining Research Centers, Writing Centers, Online Systems, and Community Programs,* we recognize their powerful influence on literacy education. Interestingly these centers, institutes, and projects often reside on the borders and outside of traditional departments. Which makes it all the more important to pay careful attention to how the technological ecologies—that are always embedded within such projects—influence, enhance or endanger the important work going on there.

Jim Porter has spent several years collaborating on the development of the Writing in Digital Environments (WIDE) Research Center at Michigan State University. In his chapter, Porter addresses how colleagues and other teams (not individuals) might sustain such a rare entity in humanistic disciplines, particularly when the research of the center focuses on projects that have two very contested characteristics (within the Humanities): projects are both interdisciplinary (often working with partners outside English studies and the Humanities) and they are digital in nature.

Jeanne Smith and Jay Sloan argue for the importance of sustaining the hard won sense of community in Writing Centers while recognizing that technological ecologies play an increasingly important role in their operations. They take one of the fundamental components of writing center pedagogy—interpersonal communities of readers and writers—and make it the corner stone for techno-ecological development. The authors are interested in integrating technologies into their workflow only if they do not disrupt the often rare interpersonal, face-to-face learning relationships commonly found in writing centers.

Mike Palmquist, Kate Kiefer, and Jill Salahub from Colorado State offer us a theory of analysis that has helped sustain their extensive and widely used online writing environment: the Writing@CSU project. Their goal, largely realized, is to provide colleagues from around the nation and internationally, extensive open access to content, teaching and learning resources, and a growing number of interactive communication forums. Activity Theory helps them plan and understand the constant re-construction necessary in such a large online system. We find their sense of sustainability compelling, as it "implies both continuity and enhancement, building and adapting."

Providing another provocative methodology for addressing sustainability, Lisa Dush authored "Genre-Informed Implementation Analysis: An Approach for Assessing the Sustainability of New Textual Practices." She uses genre theory to examine a community organization's attempt to implement a digital storytelling program. She details a number of ways the multi-year effort to implement digital storytelling ultimately failed. Dush provides a number of specific analytics, including a genre inventory tool and a protocol for documenting the textual, discursive, social, and material impacts of technology-rich pilot project activity.

CHAPTER	11
TITLE	Sustaining a Research Center: Building the Research and Outreach Profile for a Writing Program
AUTHOR	James E. Porter
OVERVIEW	The key issue this chapter addresses is how a digital writing initiative can best be sustained. The larger question behind this issue is: What role can a research center play in helping to support and enhance the profile of a writing program? This chapter addresses the sustainability efforts required—for individuals, groups, and institutions—to create an institutional commitment over time. This chapter also addresses the strategies and political mechanisms for sustaining instructional initiatives, curricular initiatives, and research initiatives, focusing specifically on the sustainability of research initiatives.
TAGS	adapt, adjunct, assistantships, autonomy, budget cycle, business plan, center, change, collaborat*, Community Programs, composition, continuous budget, contracts, course buyouts, course release, critique, curricular, digital, ecolog*, economic realities, ethic*, exploit*, external grant, first-year composition, funding agencies, graduate teaching assistants, grant writing, Grassroots, humanistic disciplines, information ecologies, information management plan, infrastructur*, initiative, Ink, institutional, instructional, interdisciplinary, Jim Porter, long-tail economics, Michigan State University, outreach, permanence, planning budget, politic*, priorities, research assistantships, revenue generation, revenue stream, rhetoric, self-sufficiency, soft money, strategies, summer support, survivability, sustain*, technolog*, tenure, the Literacy Resource Exchange, usability research, writing centers, Writing in Digital Environments (WIDE), writing major, writing, writing-across-the-curriculum, writing-in-the-disciplines
AUTHOR BIOGRAPHY	James E. Porter is a professor in the Department of Writing, Rhetoric, and American Cultures at Michigan State University, where he has served as director of the graduate program and as co-director of the WIDE Research Center. Porter's research focuses on digital writing and rhetoric, particularly issues of audience, ethics, invention, methodology, and delivery. He is completing a book titled *The Ethics of Internet Research* (co-authored with Heidi McKee). Effective in Fall 2009, he will be a Professor of English and Interactive Media Studies at Miami University.
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Sustaining a Research Center: Building the Research and Outreach Profile for a Writing Program

James E. Porter

The key question I want to address is this: How does one sustain a digital writing initiative? The larger question behind it, though, is this one: What role can a research center play in helping to support and enhance the profile of a writing program? The first question immediately needs to be qualified and parsed in two key ways: (1) "One" is not likely to sustain anything. Sustainability requires a group effort and an institutional commitment over time. "One" can gain a foothold, but in working alone, "one" cannot sustain. (2) "Digital writing initiative" can refer to an instructional and curricular initiative, or to a research initiative. The strategies and political mechanisms for sustaining an instructional and curricular initiative are different, I believe, from those necessary to sustain a research initiative. My focus here is mainly on describing the role of the research initiative, but the research initiative is certainly interrelated with the instructional and curricular. (For other discussions of the sustainability of digital writing initiatives, see Comstock, 2006; DeVoss, Cushman, & Grabill, 2005; Selfe, 2005.)

The larger context for this discussion pertains to the growth and success of a comprehensive writing program, the five elements of which are typically these:

- a first-year composition program,
- a writing major (often a professional or technical writing major),
- a graduate rhetoric and composition program and/or graduate professional/technical writing program,
- a writing center, and
- a writing-across-the-curriculum or writing-in-the-disciplines emphasis.

What happens when you add a writing research center to the mix? At Michigan State University, we added precisely that element to the usual five. In 2003, the MSU Foundation awarded Jeff Grabill and myself a Strategic Partnership Grant in the amount of $553,000 to create the Writing in Digital Environments (WIDE) Research Center. The purpose of the Center is to promote and support faculty research of online writing. Specifically, our research mission is to investigate "how digital technologies—such as the networked personal computer, the Internet and World Wide Web, and computer-based classrooms and workplaces—change the processes, products, and contexts for writing, particularly in organizational and collaborative composing contexts" (WIDE Research Center, 2006).

My aim in this chapter is twofold: First, I examine how to shape and sustain a digital writing initiative such as the WIDE Research Center; second, I reflect on how the presence of a research center, one devoted to exploring digital writing practices, can help support and promote the overall writing program—and particularly its research and outreach efforts. Mainly I will be telling the story of the WIDE Research Center at Michigan State University (http://www.wide.msu.edu)—or, rather, my version of that story—explaining how WIDE came into existence, how it sustains itself, and how it contributes to MSU's overall writing initiative.

But the story is more than simply a local narrative. The theoretical frame for the story is institutional critique, a rhetorical theory about how to change institutions, particularly how to change existing university structures and disciplinary attitudes to carve out space and secure sufficient, ongoing support for writing programs (see Grabill, Porter, Blythe, & Miles, 2003; Porter, Sullivan, Blythe, Grabill, & Miles, 2000; Sullivan & Porter, 1993). In regards to composition, the chief question institutional critique asks is: “How should we re-design institutional spaces to support and sustain writing instruction on campus?” And so my story is also an argument about the growth and sustainability of the writing program itself, and about the critical role that a research center plays in that effort. I see the research center as a key strategic mechanism for developing the research profile and outreach component of the writing program. Those two capacities are becoming increasingly important, I believe, to the continued development of writing programs and, even, of the field of rhetoric and composition itself.

DEFINING SUSTAINABILITY FOR A DIGITAL WRITING INITIATIVE

Sustainability and Survivability

Critical to this discussion is defining sustainability and considering the process for attaining sustainability for a digital writing initiative—or, indeed, for any kind of writing initiative. Environmental notions of sustainability pertain to supporting ecological systems at a level that they can support human use and interaction within those systems. For example, according to the principles of sustainable development, we should not overfish; we should only fish the oceans to an extent where fish are able to reproduce at a level equal to or greater than the level of fish harvesting. We are currently dramatically overfishing our oceans, depleting fish resources at a dangerous level (Montaigne, 2007).

That same sense of reproductive balance or regeneration does not exist, at least not in quite the same way, in academic organizations. In universities we are not developing initiatives within an ecological system or a biological reproductive system—and so our notions of and criteria for sustainability must be fashioned differently, without recourse to reproductive and biological models. Our models are dependent more on variables related to institutional priorities, politics, and human will, whim, and commitment.

Sustainability certainly includes the notion of survivability. Thus, an initiative that is sustainable endures, it lasts, it has continuity. Survivability is the capacity of an organization, program, or group to maintain its operations, its financial base, and its institutional resources, and to develop, change, and adapt those operations to suit changing circumstances over time. However, the term sustainability, particularly as it is used in environmental contexts, is more than mere survivability. Sustainable development means surviving, growing, and changing without depleting resources, without exploiting people or natural resources and without damaging the environment (i.e., the institution). In other words, sustainability adds an ethical component to survivability: it means developing a self-supporting system that grows but that does not waste, deplete, exploit, or result in net loss. According to the World Commission on Environment and Development (1987), sustainable development is

> development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts: the concept of “needs,” in particular the essential needs of the world’s poor, to which overriding priority should be given; and the idea of limitations imposed by the state of technology and social organization on the environment’s ability to meet present and future needs. (p. 43)

As applied to writing programs, we can distinguish between programs that survive versus those that are sustainable. A program might *survive* by exploiting adjunct faculty at a low rate of pay without benefits; by tolerating large class sizes; or by relying on extensive and regular use of unpaid graduate student labor. The concept of sustainability, though, applies an additional set of ethical criteria: Sustainable means that your program survives while meeting acceptable standards for class size and treatment of adjunct faculty and of support personnel.

In regards to digital writing initiatives, I see the following criteria as critical to any notion of sustainability:

- the ability to continue functioning effectively and successfully at a desired level of operation and activity and
- the ability to grow, change, and adapt to meet changing needs while not
- depleting resources or oppressing the people involved in the effort (e.g., without relying on free or undersupported faculty and graduate student labor), but while
- prioritizing the needs of those who most need help ("the poor"), and
- protecting fiscal continuity and/or administrative commitment from year to year (nothing is forever, but the funding commitment is ongoing and "expected" rather than ad hoc).

Who are "the poor" in a digital writing initiative? In the context of university-based digital writing initiatives, the poor refers to various groups, including lower-income students who might not have the resources to purchase expensive hardware and software; technical laborers (often students) who provide support for digital writing initiatives (e.g., maintaining networks and servers, creating Web sites); and adjunct and undersupported instructors (often graduate teaching assistants) who teach digital writing courses. A digital writing initiative has the ethical responsibility, for instance, to insure that lower-income students are not disadvantaged in their learning; a digital composition curriculum must provide economic assistance to enable students to participate fully (e.g., subsidizing technology purchases; sponsoring a laptop loan program).

Notice that this definition of sustainability includes a "depletion" variable, just like environmental notions of sustainability: In fashioning our digital writing initiatives, we must not deplete our (human) resources—that is, we must avoid working within a deficit mode of development, particularly in regards to the labor involved. This applies to our own labor and the work of others (e.g., graduate student labor). An initiative based largely on "free" faculty labor or on "free" graduate student assistance (often justified on the basis that it's "good for their professional development") is on ethically shaky grounds. Having said that, I must say that launching a digital writing initiative and gaining a foothold for it in the initial stages almost always requires (in my experience) operating for a while with lack of sufficient support and reward. Getting a digital initiative started often requires the commitment of a technorhetorician pioneer—a faculty member willing to do the very hard work of gaining a foothold for the initiative and carving out a space for such an initiative within the institution. This work is frequently supported by the un- or underpaid efforts of graduate students. I admit that this kind of effort is often necessary to convince the Department of English and/or humanities faculty that such a digital initiative is *necessary*, not optional, for teaching writing effectively in the digital era.

The irony about this is that to achieve a sustainable digital initiative you might have to build it on the backs of oppressed labor—for example the lone technorhetorician faculty member working without course release or administrative compensation (the work thereby threatening her movement toward tenure), and/or the labor of the few graduate students willing to volunteer their time. In a way, this is long-tail economics (Anderson, 2004, 2006): You are willing to invest free labor at the front end because you are committed to the cause and because, you hope, the effort will result in stronger, more sustained commitment down the road. This is disciplinary courage of the sort that many scholars and teachers in rhetoric and composition (e.g., Janice Lauer at Purdue University; many rhet/comp doctoral students at Purdue University, such as Tharon Howard) have exercised to gain a foothold for a new field in an institution not immediately convinced of its worth. Initial efforts will be un- or underpaid, unrewarded, and unacknowledged—maybe even resisted or detested. But you hope that the effort will result in an institutional conversion that will lead toward positive recognition, appreciation, and monetary support. In my experience, breaking new ground almost always requires this level of commitment, trust, and hope. This stage of gaining a foothold is fraught with peril.

Levels of Support

Table 1 identifies three different levels of support for a digital writing initiative. These levels look like stages of development, and they may indeed work that way, but not necessarily: Not all digital writing initiatives start out at level 1 (happily)—and not all achieve level 3 (unhappily). But the process of securing a sustainable initiative requires working toward a level 3 commitment. At level 3—at least as pertains to a research-extensive university (or, under the old Carnegie Foundation classification, a Research 1 institution)—you are working collaboratively within a team of multiple faculty members; you have dedicated staff and technical support; you have dedicated graduate assistantships; you have control of your own budget and discretionary authority over spending. In other words, you have continuing institutional commitment and fiscal support. No funding lines are ever permanent, but you have a reasonable expectation that the monetary support will continue. However, the technorhetorician starting out at level 1 needs to begin by changing the culture of the institution, seeking out kindred spirits and partners, building a community with graduate students. Hiring beyond the single faculty member to build a cadre of faculty members committed to digital writing is crucial. A key metric of this stage is multiple faculty members teaching and doing research in digital writing. (As of 2008, the WIDE Research Center had two faculty co-directors; the department of Writing, Rhetoric, and American Cultures had a total of seven faculty in digital writing.)

Table 1. Levels of support for a digital writing initiative.

LEVEL	AGENTS	GOALS / EXPECTATIONS	LABELING	FUNDING
1	the technorhetorician "pioneer"	• gaining a foothold • establishing a presence and identity	"effort"	• no funding or small ad hoc funds • based primarily on volunteer labor • minimal reward and recognition
2	one or two faculty leaders and a few committed graduate students	• fostering a community; creating a supportive climate • extending reach and impact	"initiative"; "program"	• soft money, but usually available • course release or summer money for coordinator • graduate students on hourly pay
3	multiple faculty directors or principal investigators; multiple graduate students; established technical staff	• sponsoring and supporting research • supporting other programs and faculty (not just itself)	"center"	• autonomous and/or continuous budget • graduate students on full-year research assistantships

Metrics of Success

Here it is necessary to distinguish between instructional and curricular sustainability, and research sustainability, because the metrics for success are quite different. The sign of success for an instructional or curricular initiative is that the initiative disappears—that is, it becomes so embedded in the institutional funding structure that it is no longer considered “special” or “extra.” We know that support for digital writing instruction is “sustained” when support for it becomes transparent, unexceptional, normal—for instance, when upgrades for hardware, software, furniture, space allocation, and space redesign are built into a regular budget cycle. It is important to build budgetary permanence and budgetary autonomy into an initiative’s operation. Of course, permanence and autonomy are relative terms. There is no such thing as a permanent or completely autonomous budget in academia. However, what you do not want is the need to secure approval year-after-year for new monies. Life on the edge is anxiety producing, not to mention exhausting. It is dangerous for money to be in the same pot competing with different priorities—for example, merged with the department’s literary journal budget or faculty travel money. Your money should be earmarked for the digital writing initiative. Control of that money should be independent, even if access to it requires approval (as it always does) by an upper administrator and even if that money is merged into some other funds.

Sustainability for a research initiative is quite different. By its very nature, a research initiative has to reinvent itself constantly. It can never get comfortable; it must always be pushing the envelope and morphing into new configurations. By definition, a research center must keep moving; it must remain on the cutting edge; it must maintain high visibility; and it must attend constantly to its revenue stream.

DEVELOPING AND SUSTAINING THE WIDE RESEARCH CENTER AT MICHIGAN STATE UNIVERSITY

The idea of the WIDE Research Center did not hatch so much as evolve. In Spring 2001, when I was negotiating for my position as Director of Rhetoric and Writing at Michigan State University, I was engaged in a four-way negotiation with the Chair of the Department, the Associate Dean of the College of Arts & Letters, and with the Provost’s Office. The discussions focused on the level of support needed to create a truly excellent comprehensive writing program at Michigan State University, mainly centering on the resources necessary to start a new graduate program. (The University already had an established first-year composition program and an excellent Writing Center, but it did not have a graduate program in rhetoric and composition.)

A key component of those negotiations was my insistence on hiring additional faculty in the area of digital and professional writing. My past experiences at other universities had convinced me that *the* critical component of achieving academic program sustainability is faculty lines—dedicated tenure-stream commitments to an area of research. A tenure-line faculty appointment is the longest and strongest form of institutional commitment possible at any university. Aside from securing that level of long-term institutional commitment, to succeed in meeting its goals, any writing program initiative just needs *help*—more people to do the work involved. The University agreed with this priority; between 2002 and 2006, we were approved to hire an additional three faculty, including one senior hire whose primary area of research expertise was digital writing. These three new hires joined four faculty members already working primarily in this area to create a cadre of seven tenure-stream faculty members working primarily or significantly in the area of digital writing. Two of those three hires—Jeff Grabill and Bill Hart-Davidson—eventually became co-directors of the WIDE Research Center, along with myself.

What was explicit in those early negotiations in Spring 2001 was the idea of a dedicated technical laboratory that would be a place for faculty and graduate students to work together on issues of research and teaching. What was also explicit was that digital writing would be a significant emphasis within the new program, both at the undergraduate and graduate level. The University committed itself to achieving these goals. By 2002 we had developed a BA in Professional Writing, an MA in Digital Rhetoric and Professional Writing, and a PhD in Rhetoric and Writing with a concentration in digital rhetoric. Also by 2002, the idea of a research center had taken a clear shape. Jeff Grabill arrived at MSU as a new senior faculty member in Fall 2002, and one of the first things he and I did was apply for funding to support a research center. We started with the normal and customary internal avenues for securing startup money. In early Fall 2002 we applied for an incubator grant of $75,000 to establish what we then called the Digital Writing and Reading Research Center. This first effort was unsuccessful; in fact, our proposal was not even approved within our College because our plan was not considered significantly “humanities-based.”

Perhaps it is a mistake to say that our first effort was unsuccessful—it was, in fact, wildly successful, just not in the way we expected. Our proposal attracted the attention of the Vice President for Research and Graduate Studies, who encouraged us to think along different funding lines. In Spring 2003, Jeff and I refashioned our original proposal and applied for a Strategic Partnership Grant (SPG) from the MSU Foundation. We wrote a 1-page concept statement proposing to create the Writing, Information, Design in E-Space (WIDE) Research Center”). We requested $553,000 for 3 years of startup funding—that amount being a relatively low figure for the MSU Foundation, which was accustomed to awarding grants of more than one million dollars for science and technology initiatives. In June 2003 we were invited to present our proposal to the Board of Trustees of the MSU Foundation, a group comprised mainly of business leaders, not academics. The Trustees immediately saw value in a project that would, as they saw it, help assist business communication. They approved our proposal—the first humanities-oriented research center ever funded by the MSU Foundation—and in Fall 2003, the WIDE Center was officially launched. In terms of the categories in Table 1, Jeff and I started the initiative at level 2 and were successful in moving it to level 3.

Professional Writing Program at MSU
https://wrac.msu.edu/professional-public-writing/

Rhetoric & Writing Program at MSU
https://wrac.msu.edu

Strategic Partnership Grant (SPG) Program at MSU
https://www.msufoundation.org/strategic-partnership-grants

MSU Foundation
http://www.msufoundation.msu.edu/

Toward Self-sufficiency

It sounds easy when explained in two paragraphs, but securing this funding required a year of intense discussions, and it required the collaborative effort of a large group of faculty working to realize the concept. Our SPG proposal listed numerous strategic faculty partners inside and outside the Department of Writing, including Janet Swenson, Ellen Cushman, and Dànielle DeVoss, and including faculty in other areas: Johel Grant-Brown (Integrative Studies), Matt Koehler (Learning, Technology & Culture), Punya Mishra (Learning, Technology & Culture), Ernest Morrell (Teacher Education), Mark Wilson (Urban Planning), and Brian Winn (Telecommunications, Information Systems, and Media). These faculty helped us with the conception of the Center and committed time, energy, and intellectual effort to helping formulate a successful initiative. Furthermore, to secure SPG funding, it was necessary to demonstrate that our research inquiries had broad application and deployed multidisciplinary methodologies. We had much help from committed upper administrators, particularly from our Dean, Patrick McConeghy (College of Arts & Letters) and Cordell Overby (Office of Vice President for Research and Graduate Studies), who were both keenly committed to seeing the Center succeed.

Several notable things happened in WIDE's first year of existence (2003–2004). First, the name changed. The acronym made sense to people, but not what it stood for. People assumed that WIDE meant Writing in Digital Environments, and at some point Jeff and I just decided "okay, that's what WIDE means." Second, at first we did not have a physical location for the Center—and so a significant portion of our time and energy was spent arguing for physical space, which we secured in Fall 2004. (Securing permanent dedicated space, like securing faculty lines, is also a significant metric for long-term sustainability. As argued by Porter et al., 2000, space *matters*.) The WIDE Center now has a suite of four offices, a conference room, a server room, and a collaborative work lab. Third, for Fall of 2004, we were able to hire Bill Hart-Davidson, who joined us immediately as the third co-director of the Center and has contributed innovative thinking and invaluable leadership to the effort.

In that first year or two, we spent a considerable amount of time on administrative work (in addition to launching and sponsoring faculty research projects). We needed to clarify our research identity and mission, our priorities and our procedures; we had to plot a trajectory for our research and develop a plan for sustainability. We had to produce documents that none of us had never written before—including a planning budget and a business plan outlining a strategy for securing revenue. We had a generous chunk of startup money, but we also knew that for the Center to survive beyond 5 years, we needed to plot a course to self-sufficiency. That was the primary focus of our planning budget and our business plan, and is still a major focus of concern. (I revised this chapter at the end of year 5 of the WIDE Center, a critical stage of sustainability. We had sufficient revenue remaining from our startup funds and from our current contracts and grants to carry us through this year at our current level of operation. However, we were fast approaching the critical sustainability juncture—year 6, to begin summer 2008, at which point the SPG funding would dry up and we would need to be generating 100% of our own operating revenue. To sustain our current level of research activity, our infrastructure, our technical and secretarial support, etc., requires an annual budget of $100,000–150,000.)

The typical SPG grant, which provides 3 years of funding for research centers, is based on a start-up model for science and technology projects that assumes that 3 years is adequate time for a research center to become self-sufficient—that is, to secure adequate external grants to support ongoing projects. In our case, however, we knew from the beginning that we had to apply a different model—because we were operating within a disciplinary terrain (rhetoric and composition, professional/technical writing) and doing a kind of research ("digital writing") still relatively unknown at the university and totally unfamiliar to most funding agencies. Which foundations and granting agencies support research focused principally on composition or on the study of writing? Not very many, at least not explicitly. (NCTE and STC do provide some small research grants. Educational agencies provide support for writing research, but typically for K–12 applications.) We knew early on that our start-up phase would be slower, because we were in the position of having to gain a funding foothold—that is, from the standpoint of a research center competing for external funding, we were in a sense back at level 1, trying to establish a basic research identity and appreciation for the kind of research we were doing. Thus, we developed a 5-year sustainability plan rather than a 3-year plan, and we budgeted our operations accordingly.

Funding Sources and Research Activities

We expected that it would be difficult for the WIDE Research Center to secure large external grants exclusively on its own, and we have found that to be the case. However, three other forms of funding have proven to be promising: smaller external contracts awarded exclusively to WIDE; internal contracts awarded exclusively to WIDE; and larger external grants involving partnering with other units, disciplines, and centers on the MSU campus. We have been successful in all three categories. In 2005–2006, we secured approximately $355,000 in funding: approximately $11,000 from external contracts exclusive to WIDE, $55,000 in internal contracts exclusive to WIDE, and $289,000 in grants cooperative with other units. (A note regarding grants cooperative with other units: Not all that money comes directly to WIDE—only percentages of it, depending on our role in the project.)

An internal contract refers to work we do for a campus unit at MSU, and we have done research for both academic and nonacademic units on campus. For instance, we have contracted projects with both the Office of Affirmative Action and with the Academic Advising Office to help them update and develop the information on their Web sites. WIDE's focus on these projects was not simply doing a Web site makeover (a type of project that we don't do), but rather *conducting research* on the *information needs* of the units. That is, we (1) conducted research into the work practices and communication patterns of each office, starting with observations of their writing practices; and (2) developed an information model for each office. An information model is a plan for developing information resources (like a Web site, but not limited to that) to help an office accomplish their work. Such a plan includes not only a model for design of an information resource (e.g., the information architecture for a Web site), but perhaps more importantly, a plan for development and maintenance of resources—something like a composing process plan and an information management plan.

Through doing this work over the past several years, we have settled into a clear research niche (not our only research identity, but an important one): We study workplace communication practices (e.g., how people access and distribute information within and outside the organization; how they collaborate on documents), and we design information models that will help them do that work more efficiently, productively, and successfully. If we think about this work using vocabulary from the field of rhetoric and composition, what we are doing is audience analysis and composing process research: assessing user needs (writers and readers) and studying writing and reading practices. But the work is more than that and different from that, too; if we couch this work in the vocabulary of human–computer interaction studies, we are studying social information networks, or what Bonnie Nardi and Vicki O'Day (1999) called information ecologies: "local habitations with recognizable participants and practices…. composed of people, practices, values, and technology" (p. 185, p. 211).

We are also studying interaction. As Bruno Latour (2005) reminded us, social networks are never static; they are moving targets consisting of an assemblage of actions occurring in time. In many respects, our main methodological focus is tracking activity rather than objects or people. (For a discussion of the complexity of interaction, see Latour, 2005, pp. 199–204). And, finally, to the extent that we are studying users and use practices, our work overlaps with usability research. Thus, we are studying composition practices to be sure, but with a focus on the social and collaborative networks supporting those practices (moreso than the composing practices of the individual writer); on writing as a type of work activity; and on the ways that participants interact in order to do writing work. This is a type of research that no other field at the university does quite so well; no other discipline pays quite so much attention to audience and user issues as does rhetoric and composition. No other field focuses quite so thoroughly on studying writing processes and interactions.

In addition to studying writing practices and the social interactions that make up such practices, we also create online writing tools. In a sense, we are involved in the development of cyberinfrastructure (American Council of Learned Societies, 2007)—the development of specialized digital tools that allow professionals to do their work more productively. Three such tools developed through WIDE projects are:

Figure 1. Grassroots
Grassroots is a map-creation tool for communities that allows individuals and organizations (which use maps often) to map community assets and other issues of interest in communities;

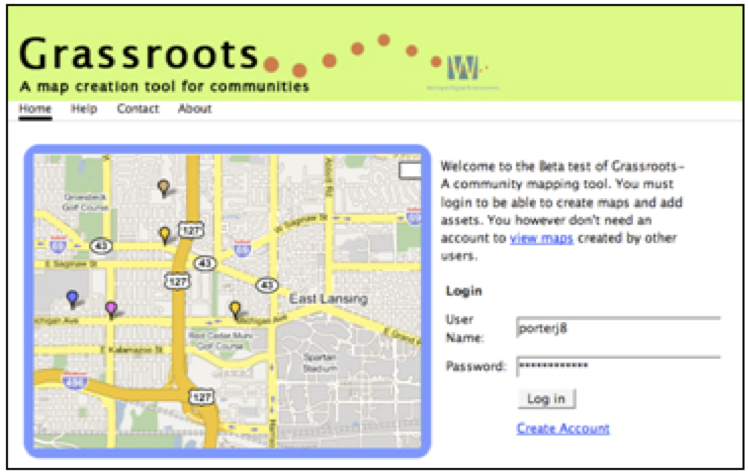


Figure 2. Ink
Ink is a simulated multiplayer game environment for promoting writing and community; and

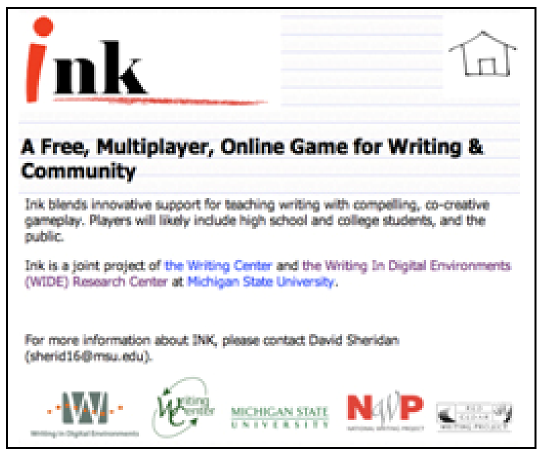
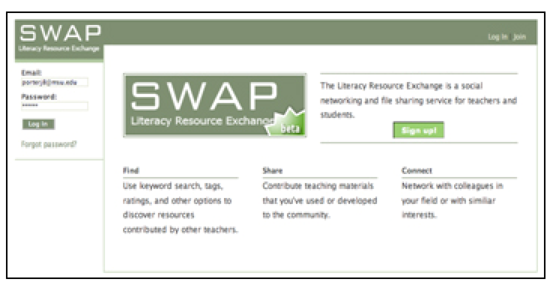


Figure 3. Literacy Resource Exchange
http://tne.wide.msu.edu/.
LRE is a social-networking Web site that helps instructors and students in the Teacher Education program at MSU exchange resources related to teacher training.



Grassroots and the Literacy Resource Exchange are tools derived from our research on the information ecologies of the two groups. Both are new tools that did not formerly exist but that are needed to support the particular writing and work practices of the group. The Grassroots tool represents one of WIDE's community outreach efforts: We see it as part of our mission to help communities with their writing practices. (Grassroots is an outcome of the Capital Area Community Information Project, a 3-year outreach project led by Jeff Grabill.) The Literacy Resource Exchange was one outcome from an internal contract from the College of Education (who subcontracted the project to us using funds they received from an external Carnegie Foundation grant). As we built these tools, we were also simultaneously engaged in the process of studying the use of these tools, and then making revisions in the tools and adding new capacities based on user feedback.

Achieving Sustainability

Thus, our chief work as a research center is to observe, study, and assess the writing and communication practices of groups, offices, organizations, communities, and businesses; to recommend information models for assisting those practices; and, at times, to develop new tools to support those practices. One beneficial outcome of this work is that the partners we are working with now understand— in a way that they didn't before—what research in rhetoric and composition *does*, how our particular research perspectives and methodologies can be practically useful, and how they can help almost any organization in assessing and improving its writing and communication practices. Because we know how to study composing practices, and because we understand how rhetoric theory is useful, we contribute value. We offer a fundable service—to local communities, to business and industry, to the university itself.

At the end of our fifth year of existence (spring semester 2008, when I finish drafting this chapter), the WIDE Center is still in its early stages of achieving sustainability. We are still in the process of explaining ourselves, articulating what our research does, and showing how it adds value. In a sense, we are taking rhetoric and composition research on the road—through our various projects and internal contracts—and trying to demonstrate its importance and value outside the narrow realm of composition instruction. This effort takes time; with each new project we make progress and win converts. But meanwhile, our productivity as a research center is being evaluated by the metric applied to science and technology research centers: external funding. According to the research office that evaluates our productivity, external grants count the most. That has long been the principal evaluative metric for science and technology, but, we are discovering, it is fast becoming the key criterion even for humanities research.

The WIDE Center has been successful in achieving external funding when we have partnered with other disciplines and centers—but less successful when going it alone, because our field is still in the early stages of establishing the value of its research. The university at large and funding agencies in general do not yet fully recognize the value of research in rhetoric and composition, or in digital writing. What we have to do more aggressively—"we" meaning locally the WIDE Center but generally the entire field of rhetoric and composition—is take our research on the road and show its practical application across almost any discipline or organization and work to secure the financial support necessary to sustain that work over time.

THE RESEARCH CENTER, THE WRITING PROGRAM, AND THE DEVELOPMENT OF RHETORIC AND COMPOSITION

I want to move from the story of the WIDE Research Center—a fascinating story to be sure—to consider some broader questions about the relationship between the research center and the overall writing program, and between the research center and the field of rhetoric and composition.

First, some economic background. If you teach at a public, state-supported university, then you well know that we are in an era of declining tax-based support for higher education in the United States. Many public universities are no longer so much "state-supported" as "state-assisted"—and moving rapidly toward merely "state-affiliated." (In 2004–2005, state appropriations provided 21.7% of the total revenue for Michigan State University, which is almost equal to the 21.1% provided by student tuition.) Even though state funding for higher education has, in general, increased *in total* in recent years, the increases *in percentage* are not meeting the inflationary costs of higher education. In Michigan, the problem is due in large part to the rising cost of employee health benefits rather than to increased instructional costs.

Within this grim economic climate, one that shows no prospect of reversing, writing program administrators need to explore new sources of funding, new ways to sustain programs at a level of excellence and to also pursue new initiatives, particularly the all-important move toward digital writing instruction. It is dangerously naïve to think that we can continue to rely on the kindness of upper administrators or the continuing flow of the general fund. The tap is slowing, and is about to be shut off, particularly in regard to support for graduate education, and so we need to start thinking seriously about revenue generation. Writing programs at public universities must wrestle with supporting themselves—and, in particular, supporting the increasing need for technologically enhanced writing classrooms and for digital initiatives that are, increasingly, a *sine qua non* for writing instruction in the 21st century (WIDE Research Center Collective, 2005).

Graduate Student Support in the Research Center

Humanities departments (like English) and rhetoric and composition programs typically provide support to graduate programs through graduate teaching assistantships (TAships), which are most often used to staff first-year composition and other lower-level course offerings, and through support of the graduate director (e.g., course release, administrative stipend, staff support). Departments seldom provide support for graduate student *research*. A graduate school might provide support for graduate student research in the form of, for example, fellowships and dissertation completion grants (as does Michigan State University), but in my experience those forms of support are limited, going to a relatively small number of the more highly recruited graduate students. Such awards almost always support the graduate student's individual work rather than collaborative or client-based work. Faculty members who secure grants will sometimes offer support for a graduate student research assistantship (RAship)—and in such cases the graduate student would be helping with a research project. But, in my experience, those opportunities are also relatively rare in the humanities, and they are typically focused on individual research projects. In fact, most available funding for humanities-oriented scholarship, for both faculty and graduate students, supports *individual* work in specific (and often esoteric) areas of inquiry. Such funding is highly valued in the humanities, but in my view that value is overrated: It supports individuals while contributing very little, if anything, to program development. Often it has the effect of isolating graduate student fellows and removing their work from invaluable collaborative and programmatic interaction.

The sciences, engineering, medicine, and technology-oriented fields operate according to a different model of graduate student support, one based more on RAships than on TAships, and one based more on large-scale, grant-funded collaborative research projects in which a graduate student is working on a team to assist a particular faculty member with their work or working as part of a research center involving a number of faculty investigators and graduate research assistants. I see evidence of a trend in the direction of RAships in the humanities—that is, an expectation that graduate programs should fund their graduate students on RAships supported by faculty grants rather than on TAships supported by the general fund. (As I understand it, that is what happened with the doctoral program in Communication and Rhetoric at Rensselaer Polytechnic University.) If this trend becomes widespread, then the research center has a potentially critical role to play in providing support for funding graduate students. The model that relies on using first-year composition courses to fund teaching assistant lines for English and/or rhetoric and composition graduate students may not be sufficient alone as a model for sustaining a graduate program.

Roles and Research Opportunities

Of course, no writing research center could hope to provide more than a small percentage of the funds needed to cover the operating costs of a major writing program, particularly its two most expensive components: typically, the first-year composition program and the graduate rhetoric and composition program. At the WIDE Center we have to sustain *ourselves*, making sure the Center survives. However, we don't see ourselves as an isolated entity competing for resources. Rather we see ourselves as a part of a coordinated and cooperative ecological system, consisting of the all the elements of the writing program and focused on promoting effective writing and communication skills across the University. Thus, we are also keenly committed to helping the overall writing program in several strategically important ways, the value of which should not be underestimated.

First, the most important role of the research center might be in providing research opportunities for graduate students. These research opportunities help graduate students learn the methodological pragmatics of composition research, teach them how to apply for grants, and help them generate professional publications and presentations, thus enhancing their professional development. At any given time in the past several years, the WIDE Research Center has been supporting the work of 6–10 graduate students, most of whom are working for us on an hourly basis for various research project teams. Some are conducting empirical research inquiries (e.g., conducting interviews, doing usability work); others are engaged in network support, technology development, or Web design on various project teams. Unlike most of the projects students do in their academic coursework and for their theses and dissertations, this work is highly collaborative, involving teams of 3–6 faculty and graduate students, and often working with faculty in other disciplines or with clients across the campus or outside of it. For instance, the project team that developed and tested the Literacy Resource Exchange included seven team members: two faculty members, three doctoral students in the Rhetoric & Writing PhD program, one student from the MA program in Digital Rhetoric and Professional Writing, and one senior undergraduate major in Professional Writing. The students learned, simultaneously, the pragmatics of how to design and conduct a study, how to collect and analyze data, how to develop online tools to support writing practices, how to conduct usability testing, how to work with clients, how to structure and design Web-based applications, and how to write client-directed reports as well as to produce professional posters, presentations, and articles.

Second, the research center supports the undergraduate program as well—chiefly by providing internship opportunities (usually paid internships) for students. The WIDE Center employs numerous undergraduate Professional Writing majors on an hourly basis to work on project teams, and it also provides internships (and helps find internships) for Professional Writing majors looking to develop practical experience.

Third, the research center does provide funding—and even when not large often strategically important and timely funding—in the form of extra support for faculty travel and supplies (e.g., computer hardware); research assistantships for graduate students; hourly contract work for graduate students and undergraduates; summer support and course buyouts for faculty; summer and supplemental work for graduate students; assistance with grant writing; work space; infrastructural support for digital writing initiatives (e.g., server space), etc. When a center secures a large external grant, a component of that grant can be allocated to fund graduate RAship lines.

Fourth, the research center can provide the research complement to an instructional initiative. The WIDE Center does research and supports research pertaining to the design of computer-intensive writing classrooms, and this research emphasis has the potential to secure grant support and institutional research support for such endeavors. And, finally, the research center serves an important ambassadorial function, representing the research identity of the writing program across campus, both to upper administrators and faculty in other disciplines.

Outreach and the Research Center

The research center does much more than simply support faculty research projects. Research in the WIDE Center means much more than simply developing empirical projects and generating journal articles; it also refers to client-based contract work, to the design of products and tools to aid digital composing, and to promoting the importance of writing across the University by showing its relevance to numerous interdisciplinary research activities. Along with the Writing Center, the WIDE Research Center functions in many ways as the chief outreach component for the academic writing programs on campus (e.g., the first-year composition program, the professional writing undergraduate major, and the graduate rhetoric and composition program), reaching out through its research projects to business and industry, to government and local community action groups, and to researchers in other fields. This outreach activity has created a valuable intellectual churn, to be sure, but it is also generating revenue.

Figure 4 is a visual rendering of the six elements of the writing program mapped on a grid identifying each element's primary focus of work activity, and perhaps their chief source of funding as well: departmental/disciplinary, university/multidisciplinary, outreach (defined as work outside the university and outside disciplinary boundaries). Figure 1 maps the traditional academic structure that is still dominant now—that is, of writing program units as or in a department alongside some of the newer institutional structures (e.g., a writing center) whose locus of activity is primarily outside the department, serving as a linkage point between the academic programs and other extra-departmental groups. A key component of this model—and, I would argue, a key value that we must embrace—is *outreach*. I view the research center (and also potentially the writing center) as an institutional mechanism for developing the outreach component of any writing program. That outreach capacity is the chief asset writing programs need to develop to institutionally sustain themselves.

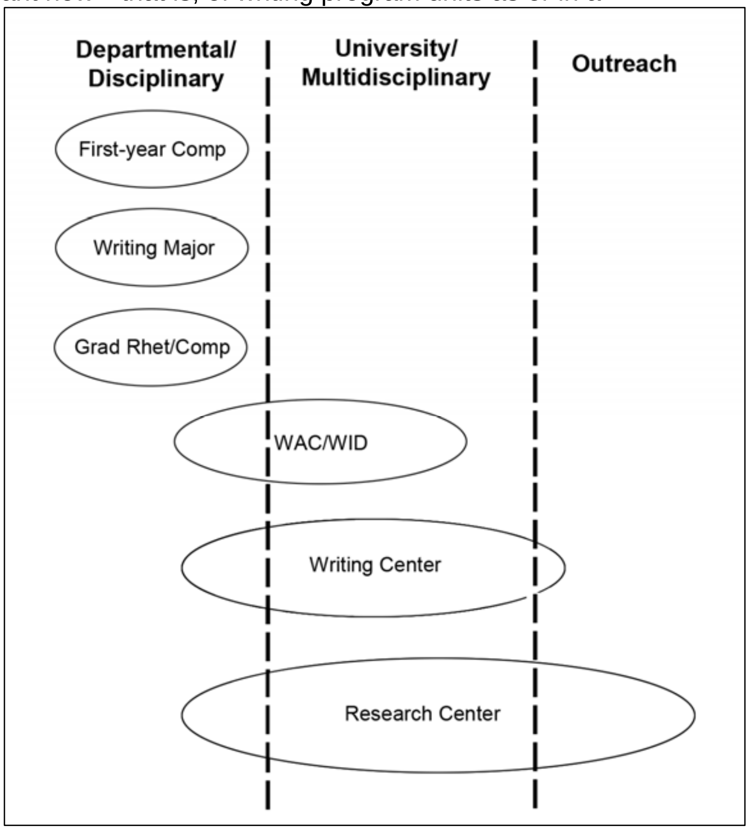


Figure 4. Components of the writing program and the locus of their missions.

Some elements of the writing program are funded within the department and their primary mission is disciplinary: They are focused on teaching writing skills or on teaching students to be professionals (professional writers, professional teachers). Some elements of the writing program—particularly the writing center and the writing-across-the-curriculum or writing-in-the-disciplines program—reach outside departmental and disciplinary boundaries to engage the university, to provide support services, or to design curricula for other programs and disciplines. Some writing centers also serve an outreach function—for example, if they provide tutoring services outside the university or if, like the MSU Writing Center, they provide support for K–12 teachers in the region. However, the primary mission of most writing centers is to serve the university at large. The primary focus of a research center, though, is to serve as a bridge across all three missions—to advance disciplinary knowledge for sure, but also to engage other disciplinary approaches to solve problems and meet needs outside the university. The research center should have a much stronger outreach mission than any other component of the writing program. It should serve as the component of the writing program most focused on connecting disciplinary thinking with the practical needs of business, industry, government, and community, but least wedded to disciplinary constraints.

Changing Circumstances and Opportunities for Growth

The writing program and the field of rhetoric and composition at large need to address the sustainability criterion that pertains to change: the ability to grow, change, and adapt to meet changing needs. This requires us to analyze deeply the ways in which he writing program and the field are going to adapt to meet changing circumstances—particularly the changing economic climate at the university; the changing metrics for evaluating faculty research and programmatic success; and the changing notions of writing, which is increasingly Internet-based digital writing.

I see the emphasis on professional writing and on digital writing as critical to the long-term survival and sustainability of the writing program and to the field of rhetoric and composition itself. Technical and business communication, and computers and composition are areas that represent the future of the field. Ironically, these are the aspects of the field that rhetoric and composition treats as peripheral. Witness how, every year, the Conference on College Composition and Communication has fewer and fewer panels and presentations focused on business and technical communication or focused on empirical research. And where is *communication* at the Conference on College Composition and *Communication*? Very few from the field of communication studies are to be found there. To establish its research foothold, rhetoric and composition has allied itself with the humanities and particularly with traditional humanistic forms of scholarship, where we have won the field some status and some (begrudging) acknowledgement that historical and theoretical scholarship in rhetoric counts, and that it is a legitimate form of humanistic scholarship. But what about composition research that is empirical, observational, and person-based, of the sort that the WIDE Center emphasizes? Although that research tends to be more valued across the university, it is less valued by the humanities, by English departments, and, at times, even by writing programs. People who wish to pursue fundable digital writing research thus run some risk of having their research misunderstood and underacknowledged to the extent that it does not meet Department of English and/or humanities criteria for excellence in research. I see it as absolutely necessary for writing programs to support and develop empirical research, professional and technical writing, and digital writing and literacy as key parts of their identity, and to ensure that research in such areas is fully recognized and supported.

GETTING STARTED

My main recommendation for any writing program is to develop strategies and to design institutional structures aimed at making writing research more widely visible and at “getting outside” disciplinary thinking and departmental borders. It is important to move outside our typical academic comfort zones (e.g., the English Department, the writing program, rhetoric and composition, the humanities), which are largely departmental and disciplinary ones, and to engage a broader range of academic disciplines as well organizations and communities outside the university. Of course writing programs have often done this in regards to instruction, tutoring, pedagogy, and curriculum—for example, the writing center provides services to the entire university; WAC/WID programs help strengthen writing instruction within specifics fields; service learning programs tutoring in the community. But writing programs have much less frequently done this, in a collective way, with their *research*.

Gaining a research foothold requires, first, assessing your current situation in terms of level of support (see Table 1). If you are at level 1, most of all you need more faculty help. If you are at level 2, you need to organize and deploy available resources, particularly faculty expertise, to secure startup resources. Many universities offer internal grants to assist startup. WIDE was not successful with this approach, chiefly due to resistance within our own college. However, a productive starting point for the WIDE Center has been internal contracts (as discussed above). Look for ways that your research expertise in digital writing and literacy can contribute directly to the university. This could involve building a Web site, testing the usability of a Web site, providing workshops for teachers, developing informational or promotional materials, or studying a particular group of users (e.g., how students use library resources) to determine their needs and patterns of interaction. Sometimes this work requires technology expertise, but not always. (For instance, the first stage for our Literacy Resource Exchange project was conducting fairly traditional person-based research: analyzing audiences and collecting information about participants through observation and interviews. In the first stage we were studying an information ecology, not creating a Web tool.) Contract your services in exchange for a course release or summer stipend, for graduate student support, or for technology purchases. Be careful not to add more work than is compensated by the project. If you get on the slippery slope of doing too much work for too little return, then you will soon exhaust yourself and your productivity will suffer; you will lose rather than gain research traction. Doing one small project well, and gaining credibility through that project, can lead to more and larger projects. WIDE’s initial contract to develop the Literacy Resource Exchange for the College of Education was a small internal contract ($12,500) to do one fairly well-defined task. Doing that task well led us to receive two subsequent contracts, each one of them entailing a larger scope (and more funding).

The most immediately available client for writing research could be in the building next door to you, but of course contract work can be done outside the university as well as in it. Richard Selfe (2005) called such work “the entrepreneurial model,” and he described several universities that do this kind of work, including Clemson University and the University of Utah. The Professional Communication program at Clemson University deploys its expertise “to work on Web development and information design projects with clients from local businesses and other academic units within the university” (Selfe, 2005, p. 112). The Writing Program at the University of Utah has developed an ongoing partnership with the library. Libraries are particularly promising partners for rhetoric and composition researchers. Faculty and graduate students in writing can assist a library in a number of ways, including helping design and give presentations, studying user habits related to use of digital technology (e.g., how students do online searches), and performing usability tests on library materials. The research skills taught and valued within composition and technical communication can provide useful help to nonacademic university units such as the library, academic advising offices, and computing services.

Early in the process of establishing a digital writing research initiative, it is sometimes necessary to operate at a deficit—doing a project for little (or no) immediate reward—in the interests of gaining credibility and gaining the foothold to get the initiative noticed. It is fine to do that for a short period of time (1 or 2 years?), but if it becomes a permanent state, then the initiative is not sustainable, and you could risk damage to yourself. One way to minimize damage is to make sure that contract work has a research component to it—that is, that it addresses real research questions, that it generates findings, and that it results in professional presentations and publications. Rhetoric and composition teachers often work in a realm in which the categories of teaching, research, and service tend to blur, but there are practical reasons to make sure that your research work is distinctly visible as such. Digital compositionists expend significant effort on developing computer classrooms, mentoring teachers, providing training sessions, and ramping up new computer-based curricula. To the extent that this work is recognized, it is treated under the categories of teaching and service. It is, in my experience, seldom acknowledged as research—unless the work results in a publication. So, if the contract work you are doing is simply running workshops or making Web sites or doing Web design makeovers for campus units, then you may be performing a valuable service, but—in the eyes of the university at large—you are not doing research. You are engaged in a service activity that takes you away from, rather than contributes to, your research work. Doing such work can also have an unintended negative consequence: feeding the misperception that the field of writing is an instructional and service field only, without a distinctive research identity.

In the case of the Literacy Resource Exchange project, we designed a tool to help teacher educators share resources more productively, but we also conducted research throughout the project—at the front end, by conducting observational research aimed at determining how teachers collaborate to share resources, and, at the back end, by doing usability testing to determine the effectiveness of the Literacy Resource Exchange and to observe how teachers work collaboratively. The project has resulted in several presentations for the faculty and graduate students involved, with several papers currently in progress. Our research findings are related to how professionals use online tools and to how professionals interact with each other to do their work; the findings also explore how a social networking Web site could be designed to facilitate teacher training. The next stage of developing this project is to take it outside the university—to apply for an external grant, using our research findings to date as evidence of our expertise in the area. Thus, we built this project incrementally: starting with a small internal contract, leading to larger internal contracts, and moving toward a large external grant project.

CONCLUSION

Every English Department I've ever been in has the same standing joke for use in times of financial crisis: "We'll hold a bake sale!" Funny, but also revelatory. Underneath the joke is a sad reality—faculty have trouble imagining how their expertise could have economic value outside the classroom. Rather than fall prey to bake sale despair, we need to think creatively about how to deploy our expertise in ways valued at the university and in our communities.

The economy of the university—particularly of the state-supported university—is changing rapidly, as are the metrics for evaluating faculty research and the mechanisms for supporting graduate education. We are now in an era in which the key metric for evaluating faculty research, even in fields like rhetoric and composition, is becoming less the number and quality of refereed publications (the old model of faculty productivity) and more the number and amount of external grants funded (the new model of faculty productivity). We are entering an era in which graduate programs, even programs like rhetoric/composition, may increasingly be expected to fund graduate students from external grants (RAships) rather than instructional monies (TAships). We are entering an era in which doing good work—tenurable and promotable work—within disciplinary boundaries and according to disciplinary criteria may matter less than working across disciplinary boundaries and deploying multidisciplinary thinking to solve real-world problems. Writing programs need to adjust to thrive in the face of these changing circumstances, and the field of rhetoric and composition needs to adapt to assure its continued progress.

To do so, we must develop the research identity of the field—and develop it in ways that demonstrate its practical relevance and value to other disciplines, to business and industry, and to local communities. The field of rhetoric and composition has thus far largely secured its identity and value to the university through pedagogical and curricular work, through a commitment to the teaching of writing—and that effort has been quite successful. But for the field to sustain itself in the next decade will require a shift in our thinking and a redirection of our energies: To sustain ourselves, we must develop a stronger identity and presence as a research field—we need to reach out with our research. Professional writing in digital environments is one key area of development where our research can have significant impact.

A research center focused on digital writing and literacy can play a significant role in helping to strengthen not only the writing program but the field of rhetoric and composition generally. Although it not so much the center as the *research* that really counts, one of the key principles of institutional critique is that space matters. In the prestige competition at the university, if you don't have a clearly visible research center—a definable space, external grant support, and a clear impact on disciplinary knowledge (via refereed publications)—your field of research is not seen as significant. As a field, we need to demonstrate to the university that our research matters, that it has immediate and practical application, that it is fundable, and that it offers clear benefits to our clients and partners and to the communities in which we live. Admittedly, there are a number of different ways that we can do this, but what I am suggesting here is that the research center is the best institutional mechanism for addressing that mission and achieving that goal.

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CHAPTER	12
TITLE	Sustaining Community and Technological Ecologies: What Writing Centers Can Teach Us
AUTHORS	Jeanne Smith Jay D. Sloan
OVERVIEW	Technology succeeds pedagogically when it supports, enhances, or otherwise extends the social fabric of a community; it fails, proves unsustainable, when it violates the expectations, rules, or needs of that community. Perhaps because they are so invested in the notion of social networks, writing centers have much to teach us about the appropriate uses of technology. Writing center theory and practice—with its emphasis on writing (and learning) as process and on knowledge as a collaborative construction—can shed much light upon constraints under which a balanced, sustainable technological ecology might operate. In this chapter, we discuss our experiences with distance-education systems, course-management interfaces, online writing labs, and various other technologies utilized within writing centers. We provide both cautionary tales (e.g., those that describe threats to community that ensure the failure of technology use) and also offer advice for those interested in best using technology to enhance learning within and beyond the writing center.
TAGS	audience, chat, collaborat*, collaborative construction, communit*, community of writers, community-appropriate technology, computer networks, course-management, discourse community, discussion, disrupt, distance education, drill-focused computer software, ecolog*, email tutoring, enhance, face-to-face, hybrid identity, igital interactions, interdependent relationship, Jay D. Sloan, Jeanne Smith, knowledge-making, learning, miscommunication, misreading, multiliteracies, multimodal, network tutors, online tutorials, online writing labs, optimistic pragmatists, OWL, participation, recursive processes, relationships, social networks, supplement*, sustain*, teachable moments, technolog*, technoprovacateur, threaded, traditionalist, tutee, tutor, uncritical, uneasy relationship, videoconferencing, video-conferencing, virtual meetings, virtual, visionar*, voice-over-IP services, writing as process, writing centers
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Sustaining Community and Technological Ecologies: What Writing Centers Can Teach Us

Jeanne Smith
Jay D. Sloan

In utilizing the metaphor of technology as ecology, the organizers of this collection have made an important distinction. Rather than envisioning educational technology simply as an endless stream of innovative gadgets, computer programs, and networking devices that we can simply drop into our pedagogical toolboxes, the metaphor suggests a much more intricate and interdependent relationship between the technology itself, the instructors who attempt to capitalize on it, and the students who ultimately must make use of it. The challenge of the metaphor, however, lies precisely in that which is so often ignored: the simple truth that the success or failure of technology in education is inescapably tied to the dynamics of the very human system into which it is introduced. Technology succeeds pedagogically when it supports, enhances, or otherwise extends the social fabric of a community; it fails—that is, proves unsustainable—when it violates the expectations, rules, or needs of that same community. Perhaps because they are so invested in the notion of social networks, writing centers have much to teach us about the appropriate use of technology. Writing center theory and practice, with its emphasis upon writing as process, and upon knowledge as a collaborative construction, along with its insistence upon the value of face-to-face interaction, can shed much light on the constraints under which sustainable technological ecologies might operate.

In this chapter we, as writing center directors, discuss our experiences with distance education systems, course-management spaces, online writing labs, and various other technologies utilized in and around writing centers to provide both cautionary tales and helpful advice. It is our belief that the successful pedagogical implementation of technology will always increase the level of interaction among participants in a learning community. The assumption here is that pedagogically valuable feedback on writing, for example, must be found in an interplay between writer and audience. Uncritical adoptions of technology, however well-intentioned, can violate that social compact, throwing us back into a lecture-based model of learning and, in writing, to a misplaced fixation simply on error. Writing centers are deeply invested in fostering community. To create sustainable technological ecologies, we must find that delicate balancing point where community is supported by technology; then we can talk intelligently about using technology fruitfully in both the classroom and the writing center.

WARY TRADITIONALISTS, VISIONARIES, AND OPTIMISTIC PRAGMATISTS: APPROACHES TO COMPUTER TECHNOLOGIES IN WRITING CENTERS

Roberta Buck and David Shumway (2002) noted that “writing centers have for years endured an uneasy relationship with technology,” largely because of the “sense that at bottom technology, particularly asynchronous online response to paper submissions, violates the very foundation of writing center philosophy” (n.p.). To fully articulate our claims about what writing centers can teach us about technological ecologies and community sustainability, we need to review these philosophies and troubled history.

Prior to the 1970s, most writing centers in academia existed as remedial writing “labs” operated as fix-it shops to help “bad writers” clean up problems with grammar and mechanics. The contemporary writing center, however, little resembles its ancestors due to two transformative movements in the field of rhetoric and composition. Starting in the mid-1970s, process movement theorists like Linda Flower (1979), Sondra Perl (1980), Nancy Sommers (1980), and Muriel Harris (1989) helped shift the pedagogical focus of writing teachers from an emphasis on the end-product of writing to the complex, often recursive processes of writing. As a consequence, writing center tutors became important as experienced writers—as what Kenneth Bruffee (1995) called “knowledgeable peers”—able to help fellow students negotiate complexities of the writing process.

In the mid-1980s, the social constructionist movement began to radically challenge pre-existing notions of the nature of knowledge. As Bruffee (1987) described it, “knowledge is a social construct. . . intrinsically the common property of a group or else nothing at all’” (p. 44). Composition theorists like James Berlin (1988) and David Bartholomae (1995) argued that rather than an act of self-expression, writing is an act of knowledge-making within a specific discourse community. The individual writer must master the discourse of his or her community, and, thus, learning to write is, to a great extent, learning to operate by the rules and expectations of community. Of particular significance to writing centers was the emergent interest in collaborative learning, which social constructionism inspired. Utilizing the important metaphor of learning as “conversation,” Bruffee (1995) argued for the particular value of face-to-face peer interaction as a means of entering the discourse communities of academia: “peer tutoring provides a social context in which students can experience and practice the kinds of conversation that academics value” (p. 91). Significantly, then, the role of the writing center tutor as a knowledgeable peer expanded to include the sharing of *multiple* specialized knowledges—not only knowledge about the writing process, but also about the rules governing entrance to various academic discourse communities.

If this collaborative learning ethos has come to define the space and practices of the contemporary writing center, it also accounts for the troubled relationship that writing centers have often enjoyed with new technologies. For instance, in the early 1980s, writing centers were almost universally resistant to the use of drill-focused computer software to teach writing, precisely because it both tended to focus primarily on end-stage writing processes, and because it was seen as disconnected from community (see, for further discussion, Coogan, 1995; Hobson, 1998; Inman & Sewell, 2000; Palmquist, 2003). Writing center responses to more recent technologies, particularly online and networking technologies, have been more divided, however. Although the number of online writing labs (OWLs) has steadily increased over the last two decades,[1] the central question they present is still a complex and unresolved one: Do newer, networking technologies impede the kind of collaborative interactions that the writing center considers vital to learning, or do they offer us new mechanisms and new arenas for collaboration with students, perhaps more accessible than face-to-face tutorials?

In response to this central question, writing center theorists and practitioners have articulated a broad range of viewpoints over the last 15 years. Most of these claims, of course, belong to particular moments in the discussion, and are therefore not absolute, but provisional. They also obviously overlap, as it’s possible to be quite skeptical about the benefits of one technology and quite optimistic about those of another. Opinions change radically, too, as a technology develops, the context of its use changes, or the need for it increases or decreases. In surveying the history of this debate, however, we can delineate three clear perspectives on technology in the writing center community. On one side of the continuum are the views of those we might characterize as *wary traditionalists*. Few who share this conservative

[1] The International Writing Centers Association, which began posting links to “Writing Centers Online” on its organizational Web site in 2004, currently lists 138 online college and university writing centers. While the list is evidence of the ever-growing number of OWL’s, because it is voluntary, it is not a comprehensive accounting.

perspective are thorough Luddites, however. Most concede that Web-based technologies may be useful in any number of ways—for instance, in heightening the visibility of the writing center, giving it both an online face for Internet-proficient students and simultaneously appealing to what Stuart Blythe (1996) called “technology-happy administrators.” And they certainly admit the value of utilizing Web technologies to disseminate writing center instructional material and to provide links to external writing resources that student writers might find helpful. It is not surprising, then, that because even these most cautious members of the writing center community accept these technologies as beneficial that the more rudimentary form of online writing labs—static, informational OWLs—are quite common.

The traditionalist’s belief in the value of more interactive technologies—for use in actually conducting online tutorials—is far more limited, however. To the extent that they endorse them at all, these practitioners tend to see online tutorials as a supplemental form of engagement at best. In “The Electronic Writing Tutor,” for example, Joyce Kinkead (1988) was excited by the possibility that technology might offer a way to assist students who cannot make use of the writing center’s regular services due to time and distance issues. Yet she was careful to note that although online tutoring “offers an additional way for helping writers write, the electronic tutor cannot duplicate the comprehensiveness of the writing center tutorial or the value of face-to-face dialogue” (p. 5). Similarly, Michael Spooner, in a 1994 debate with Eric Crump in *The Writing Lab Newsletter*, insisted that “encountering a student over a text is best done face-to-face”:

> The teacher or tutor is most helpful to the student when they create a student-centered, non-directive, response-oriented, conference-style dynamic. Call it a Rogerian presence. And it is hard enough to construct this presence in a face-to-face encounter with a student; I’d argue that it will be impossible on line for all but the most accomplished of tutors. (p. 7)

On the other side of the continuum are the views of *visionaries* in the writing center community who, as Eric Crump (1994) described in his debate with Spooner, “start from somewhat different assumptions about the future of writing, and how that future will affect writing centers” (p. 6). Crump argued that we will eventually “live in a world in which writing will tend to take place on computer networks rather than in print, and OWLs are really first steps, baby steps, towards preparing for that eventuality” (p. 6). For Crump, however, this cultural shift actually represented a fruition of the writing center’s belief in collaborative learning: “To a greater extent than is possible in print, writers in networks are *conversing* as opposed to *essaying*, and that’s a pretty significant difference when it comes to how we help writers develop” (p. 6). As J. Paul Johnson (1995) noted, these “technoprovacateurs” (a term borrowed from Crump) in the writing center community, “assume a conception of literacy that looks less tied to print culture. . . . [For them] academic literacy seems more a matter of participating in literate networks than of expressing individual thought” (n.p.). These visionaries believe, then, that writing centers should exploit the freedom of their decentralized position in academia by embracing both new technologies and a post-print age, by subverting what Johnson saw as the traditional academic insistence upon “papertext.”

Similarly, others have predicted that as our understanding of what constitutes a “text” changes, so will writing center practice. Although not a “technoprovacateur,” John Trimbur (2000) claimed that the increased use of technology is forcing us to redefine literacy “as a multimodal activity in which oral, written, and visual communication intertwine and interact” (p. 29). Consequently, Trimbur argued that writing centers will become “multiliteracy centers,” and our

> work will, if anything, become more rhetorical in paying attention to the practices and effects of design in written and visual communication—more

> product oriented and perhaps less like the composing conferences of the process movement. (p. 30)

It is perhaps exactly because of this radical potential for change, that Michael Pemberton (2003) asked whether writing centers “should plan to redefine themselves—and retrain themselves—to take residence in the emerging world of multimedia, hyperlinked, digital documents” (p. 9). Pemberton considered several possible responses to this question, but by way of conclusion suggested something of a strategic retreat:

> Ultimately, we have to ask ourselves whether it is really the writing center’s responsibility to be all things to all people. . . . If we diversify too widely and spread ourselves too thinly in an attempt to encompass too many different literacies, we may not be able to address any set of literate practices particularly well. (p. 21)

Not surprisingly, the vast majority of writing center practitioners occupy a large middle ground on these questions, who we might call *optimistic pragmatists*. They believe that writing centers must embrace new technologies if they are to remain relevant to student writers and their needs. Yet these practitioners also know what their own daily experience tells them—although many students are indeed tech-savvy and readily adapt to new texts and new technologies, others (often the more marginalized students who seek out the writing center) are still firmly positioned on the computer-less side of the digital divide. Even Trimbur (2000), who argued that multiliteracies are inevitable, stressed that one major challenge facing writing centers in the future will be “develop[ing] more equitable social futures by redistributing the means of communication” (p. 30). Further, although these pragmatic optimists see that academic culture is itself in flux and its discourses increasingly shaped by technology, they also recognize that academia is not ready to abandon written text; academia is still largely dominated by a traditional papertext culture. Writing centers, therefore, cannot afford to adopt extreme positions of either rejecting technological advances or becoming wholesale technoprovacateurs.

What is needed instead, these pragmatic optimists have argued, are clear-sighted, judicious visions of and uses for new technologies supported by continuous research to help define best practices. In a paper presented at the Conference on College Composition and Communication in 1992, Valerie Balester envisioned a then still “imaginary” future in which communication technologies could make writing centers more truly collaborative by dispersing the authority of the one-to-one tutorial across larger writing groups committed to sharing and collaborating across texts. The tutor would become but one voice in this larger collaboration. Because the technologies used to link students would also produce written transcripts, researchers would be able to “catch far more of the interaction than ever before.” At the same time, Balester noted, “the nature of the interaction will change because of the computers, and that will be something in itself to research.” (p. 7).

Since Balester’s early 1990s presentation, pragmatic optimists in the writing center community have experimented with the pedagogical uses of technology in many ways. For instance, in a 1995 special issue of *Computers and Composition* devoted to writing centers and computers, David Coogan noted optimistically that ”e-mail provides an alternative model where writers can inhabit alternative writing spaces.” Nonetheless, he ultimately concluded that, “in many ways, I don’t feel ready to recommend e-mail to writing centers” (p. 179), noting that it requires a measure of commitment to one’s writing and to the time-consuming negotiations of asynchronous communication that many students just don’t have. Yet, in 2002, only 7 years later, the International Writing Centers Association Press produced James A. Inman and Clinton Gardner’s *OWL Construction and Maintenance Guide* on disk, a self-described “CD-ROM resource created by online writing center professionals for online writing center professionals." Michael Pemberton was so impressed by the comprehensiveness of this collection that in 2003 he claimed that there may be little need for further work in this area "for quite some time" (p. 14).

Clearly, Balester's "imaginary writing center" of 1992 has been re-envisioned and recreated many times by pragmatic optimists within the writing center community, and there is no evidence that their efforts are slowing.[2] The majority of writing center professionals remain committed to exploring and exploiting technology to enhance student learning. But these efforts are still largely shaped by their steadfast belief that student learning is about connection to, and collaboration within, community. For this reason, writing center practitioners continue to privilege the face-to-face tutorial. It is in the live, side-by-side exchanges of tutor and student that writing center professionals see community operating most fluently and fluidly. For them, the intimacy of the physical space of the tutorial, at least potentially, is mirrored in an intimacy of interpersonal communication.

Within the workings of a live tutorial, both tutor and student have ready access to a complex body of information encoded in a range of communicative acts—the written text being shared, the conversational exchanges that take place, the displays of body language—all of which are more easily read and interpreted face-to-face. Should uncertainties arise for tutor or student, the potential for immediate clarification always exists in live conversation. The tutor can readily adapt to both cognitive and affective responses in the student (comprehension and excitement, confusion and frustration, etc.), and the student finds a sense of safety and trust in the immediate, personal attentions of a "knowledgeable peer," in a relationship that makes it easier to share, shape, and further explore ideas. As suggested in the philosophical overview above, writing center practitioners hold very ambitious goals for the writing center tutorial. It is a space where knowledge is collaboratively constructed through the shared authority of peers. Phyllis Lassner (1994) characterized the face-to-face tutorial as a space in which "neither the tutor nor tutee are designated as subject or object, but enact a fluid process of selves" (p. 158).

Such personal exchanges are significantly complicated in technologically negotiated tutorials. Unlike the face-to-face session, there is both the problem of access to technology and an initial learning curve to overcome; both tutor and student must have the resources to become technologically adept. Further, the roles and communication practices of both tutor and student will be altered by the nature of the technology itself. In the asynchronous online tutoring (via email) that began to appear in the 1990s, for example (which represented the next step in OWL development—from the informational to the interactive), tutor and student existed only in text, and their textually encoded "conversational" exchanges of necessity spread out across days, rather than the minutes required in a live tutorial. Coogan (1995) attempted to argue for the benefits of these radical transformations. Email tutoring, he claimed, allows for more honest and open exchanges than are possible face-to-face, allows the tutor and student more time to consider and respond, allows for more questioning of each other's ideas and opinions, and enables an "invigorated" tutorial in which the "social energy of reading a person" is directed into "the reading of a text" (pp. 176–179).

As noted above, however, even Coogan himself seemed finally unconvinced of his own arguments. For the writing center community, the positive affordances of asynchronous, email tutoring did not fully and finally outweigh the negatives. Collaborating via written text is

[2] Recent discussions on WCenter, the email discussion list of writing center professionals, reveal a current, evolving interest in synchronous online tutorials, and the various technologies that might best enable them, such as Wimba, AskOnline, WCOnline, Adobe Connect, Skype, Blackboard, and even virtual writing centers in Second Life.

cumbersome and demanding work, requiring a far greater investment of time, a precious resource in most writing centers as well as in the lives of student clients. And miscommunications and misreadings are both far more likely and more difficult to remedy. Further, it is not only writing center professionals themselves who judge asynchronous communications less desirable. Despite the apparent convenience of asynchronous tutorials for students (e.g., not having to come physically into the writing center, being able to work on one's own schedule), usage rates in most writing centers reveal that, given their choice, students prefer live tutorials over the email tutoring available through many OWLs. Asynchronous tutoring thus remains, as Joyce Kinkead predicted in 1988, primarily only a supplement to live, face-to-face tutorials. Time will tell whether newer, synchronous technologies will fare any better, but the experience of writing center professionals to date suggests that the litmus test of viable and sustainable information and communication technologies continues to be whether or not they enhance community and communal functions. The doubts of the wary traditionalists, the soaring aspirations of the visionaries, and the steady investigations of the optimistic pragmatists continue to revolve around this central concern.

CAN YOU HEAR ME NOW? THE MUFFLING OF COMMUNITY

With this as our disciplinary backdrop, we—both of whom consider ourselves optimistic pragmatists with perhaps visionary leanings—now move into specific stories of our writing centers as we have negotiated particular technologies and laid them side-by-side with what we know of best practices in writing centers. The four stories we tell include (1) a discussion of teaching a "Tutoring Writing" seminar as a distance-education course; (2) one perspective on the benefits of a course-management system for tutor development and training; (3) a different perspective focusing on the drawbacks of a course-management system; and 4) a discussion of navigating asynchronous and synchronous online tutoring. We tell these stories to further illustrate the ways in which communication and information technologies can either disrupt or enhance, upset or sustain, a community of writers and writing center practitioners.

Story 1: Distance Education

Several years ago, the directors of the various writing-support services (writing centers, academic skills centers, etc.) on all eight of Kent State University's campuses formed a new committee as a venue for collaboration and the sharing of resources. Because our eight campuses differ widely in size and resources, Jay was asked by the group if he'd be willing to share his "Tutoring Writing" course with campuses unable to offer such a tutor training course themselves. He agreed, and in both fall 2004 and fall 2005, "Tutoring Writing" was offered as a distance-learning course across multiple KSU campuses.

From the start, Jay was concerned that community-building be a central aspect of his course. Becoming a good tutor requires not only exposure to the extensive scholarship of writing center theory and practice, but also continuing opportunities to collaborate with peers—discussing tutoring concepts, sharing tutorial experiences, brainstorming, problem-solving, and mentoring. A long-time believer in the primacy of face-to-face collaborations, Jay was anxious to find technologies that would foster, as much as possible, the live exchanges of his class community. Thus, after reviewing the various distance-learning technologies available at Kent, he chose to use V-Tel, a room-based video-conferencing system. Reasoning that a pure Web-based course could not offer much peer-to-peer interaction beyond that possible in discussion boards and email, he rejected that option. And although Learn-Linc, a PC-based video-conferencing system, would allow students to see and hear the instructor, there were no opportunities for students to interact with each other beyond those found in a Web-based course. That left V-Tel.

V-Tel is, of course, an “old” technology. It emerged in the late 1980s and was picked up widely at institutions with satellite locations or regional branch campuses as a means of offering a wider array of courses and instructors to a larger body of students than could be had otherwise. A room-based system, V-Tel utilizes a central station from which the instructor can control the video broadcast, switching from live camera feed, to videotapes/DVDs, to transparencies, to computer files, or to the Web. Each V-Tel lab at each campus location has, in addition to such a station, two large video monitors, one showing the instructor (or other media on display) and the other showing, at any one time, one other V-Tel lab on one other campus. Two large video cameras are located in the room: one at the back focused on the instructor, and the other in the front focused on the classroom. Students have access to individual computers and microphones. A student with a question or comment can tap the microphone, and the large camera in the front of the room automatically pivots to focus on that student, broadcasting image and voice to the other campuses.

Jay was hopeful that the technology would enable communal functions, despite the obvious difficulties. One problem was the logistical issue of how to distribute course materials across remote campuses; in addition to V-Tel, Jay chose to use Web CT Vista as a course-management tool. Jay developed an extensive Vista site that would allow student Web access to course materials from the regional campuses as well as from their homes. On the site, Jay posted folders filled with a wide range of content: “Welcome and Tech Support,” “Course Syllabus and Calendar,” “Course Handouts and Assignments” (as Microsoft Word files); “Course Readings” (as PDFs); and a “Research and Resources” folder filled with links to writing center-related research databases, Web sites, and conferences. Students’ final research projects were also posted to the site, making it a course archive as well. Jay also added interactive elements, including weekly threaded discussions and internal email accounts for student use. Although he struggled with it for two semesters, Jay ultimately concluded that the V-Tel technology was, despite its apparent connectivity, ultimately inimical to the functions of community building and the goals of writing center pedagogy.

The technology was unreliable; on more than one occasion, the electronic bridge between campuses failed, interrupting class sessions as technicians struggled to reestablish the link. And, at least once, they were unable to reconnect, effectively ending the class session altogether. Another issue was the quality of the video and sound. The camera images of the lab classrooms were fuzzy and dim; it was very difficult to distinguish which student was speaking, especially because the camera tracked so slowly that a student would often be finished with a comment before the image came into focus. Exasperatingly, there was also a 2-second lag in sound, generating many apparent interruptions when more than one person attempted to speak. Because students on the various campuses could not see or hear each other clearly, they couldn’t take turns as they would have in a regular classroom. One of the most frustrating aspects of the V-Tel classroom was the inability to monitor the various classrooms effectively. Only one lab was visible at a time, and because cameras were microphone-activated, Jay could not even select the lab to show on screen. The degree to which this technology complicated and interfered with social interactions quickly came to be seen as *the* mark of its failure by the students and instructor alike. Students did not perceive the V-Tel classroom as “real,” despite the fact that they did indeed meet in “physical classrooms”—the V-Tel labs on each campus. Something essential was clearly missing.

One student noted, “I really do not like V-Tel. It diminished my learning. I can only imagine how it would have been if you were here teaching [the entire semester] instead,” seeming to indicate that the physical presence of the instructor would have made a vital difference in the experience. In anticipation of this problem, Jay had actually traveled from campus to campus through much of the semester, broadcasting from a different location each week and trying to bolster a sense of community as he went, but this seemed only to highlight the problem. One student claimed, “when you visited the class and when we talked in person, it gave me a better feeling about what was happening in class. During a normal class session, it seemed dry and stalled most of the time due to the lack of student–teacher interaction.” Another said, “frankly, I disliked the technology used. I felt disruptive asking questions and it felt ‘clunky.’ [Class] was so good when you were here; we could all converse without having to chime in on the microphones. The V-tel created minor confusion and you felt far away.” In the V-Tel classroom, then, conversation—the lifeblood of community—had become difficult; V-Tel muffled and obscured it. And, as a result, student learning was diminished, and their willingness even to ask for clarification ebbed. As their sense of community dissipated, with it went the sense of being seen, heard, or valued. As one student commented, “it is really hard for me to participate the way I would like, and it is not intimate at all.”

As student word of mouth darkened, Jay found that the use of V-Tel technology not only failed to foster the multi-campus, KSU-wide tutoring community he was trying to establish, but it also disrupted his own writing center community on the Stark campus. In the years prior to the change to distance learning, Jay’s enrollment in the Tutoring Writing class on his campus averaged 10–12, a strong showing which ensured that his writing center would continue as a vital community. During fall 2004, the first year of the distance-learning offering, that number dropped to 6, and by the second year, to only 4. Jay found it increasingly difficult to recruit students to the course, and thus the future of his own campus writing center was put at risk.

For these reasons, Jay finally abandoned the distance-learning version of his course. Although he knows that students still gained something from his course, he now knows as well that the true functions of community are not easily emulated via V-Tel technology. Luckily, the negative effects on his writing center community were temporary. Jay’s tutoring writing class rebounded quickly, with 11 students in the class in fall 2006, and 11 registered for fall 2007. He regrets that he is no longer able to offer the course to students working in writing centers on the other Kent campuses, but is satisfied that, in his class and in his writing center at least, community is once again operating fully, richly, and effectively.

Story 2: Course-management Systems: One Perspective

Had Jay not attempted teaching via the V-tel system, he would not have discovered the value of another technology, one initially adopted to play only a minor, supporting role. Not only did the Web CT Vista course-management system help resolve some of the student confusion created at the outset by V-Tel, it has also proven remarkably helpful to students even now that the Tutoring Writing course is limited to Jay’s campus. Students remain consistently enthusiastic about it, and continue to see its value in supporting their community. As one student noted, “I think that Vista is an excellent external source. It is a well organized Web site that we can go to when confused."

Having this Web-based course-management system allows for the flow of information within the community, particularly the posting of course materials, which are then always available to students. Students have even asked to retain their access to the site even after the course has ended. As they continue to develop as tutors, and as undergraduate researchers in the writing center, they frequently revisit the site to consult readings and other resources. Jay has had former students, now in graduate school at other universities, ask to renew their access. Under continual development for several years now, the site has become a substantial archive of tutoring-related materials, not the least of which are student research projects. These offer new tutors an important pool of student work to help guide their growth as tutors, and their emerging research agendas as well.

Further, within the confines of the course, the internal discussion function on Vista creates an interactive space for tutors to “talk” about readings, about tutoring, about course projects, and about whatever is on their minds. Jay asks for a volunteer discussion leader to both initiate and wrap-up a tutor discussion each week, allowing for more student control over the conversations than can usually be found in standard, instructor-mediated classroom discussions. Also, because these discussions are threaded, students have no difficulty revisiting (or even reopening) specific conversations held earlier in the semester. Additionally, though they are no longer in the course themselves, senior tutors in the writing center retain their access to the site, and they, too, are invited to listen in and contribute to ongoing discussions. In this way, the conversations occurring on the site parallel and extend the live conversations actually occurring in the center itself. Here, too, the text of these ongoing discussions can be kept across semesters and years as a living archive of useful student thinking about tutoring.

The internal email accounts provided on the course-management site have also proven to be an enormous asset in sustaining efficient communications within the class community. Because the site accounts are separate from students' university accounts, they are not subject to the server space restrictions that constrain their regular email. Students and the instructor can exchange emails with sizeable attachments without the problem so often encountered with external student accounts: bounced emails and "over quota" error messages. Further, because these accounts lie behind the restricted access of the site, they are more easily kept free of clutter and spam. Vista email is thus more efficient and focused. What is clear about Jay's use of the Vista course-management system is that, unlike V-Tel, it is supportive of communal functions, and for that reason, it has proven to be an easily sustainable technology. In many ways, it extends the exchanges and conversations of the community, making the discussions even more fluid, flexible, and efficient than they are in face-to-face communications alone.

Story 3: Course-management Systems: A Different Perspective

An early adopter of various technologies in the classroom, Jeanne tried to extend her success with the university's course-management system to the writing center. Although a writing workshop classroom has many elements in common with a writing center, it is a very different social ecology. A writing center is more self-consciously cooperative than most classrooms, authority is very deliberately shared, and knowledge is constructed collaboratively as student–tutors work with student–clients. Ellen Strensky (1995) noted that a director's role in relation to the tutors with which she works is multifaceted and complex, characterized by the "quasi-pedagogical, quasi-administrative activity of staff development" (p. 247) that lends itself well to electronic communication. Neither wholly instructional, wholly collegial, nor wholly administrative, digital communication technologies can contain elements of all three roles. The director's most important function is as a coach and resource person to support tutors, and this relationship must be mirrored in the online world. Learning about her own role in the social ecology of the writing center has allowed Jeanne to use on online workspace effectively, but not without a false start.

Given the ubiquity of online communication and social-networking software—IM, MySpace, LinkedIn, Facebook, Ning, Flickr, YouTube, and more—in students' lives; knowing that communicating and networking is arguably how students use the Internet most; and knowing that collaboration is at the heart of writing center work, Jeanne tried to use the available campus technology, the Web CT course-management system, as a way to network tutors efficiently. Even before meeting her tutors, she created a staff work space in the course-management system, with areas for discussions, chats, tutor-development resources, access to important forms and handouts, links to instructor course materials, and a calendar of events. Thinking that reducing the number of face-to-face meetings would make collaboration easier for her time-pressed staff, she replaced every other weekly face-to-face meeting with an asynchronous virtual staff meeting inside the discussion tool in the course-management system.

At first, the response to the virtual meetings was positive; online discussions were robust and multi-layered, with topics ranging from how to break the ice in a session with a reluctant writer, to revising the writing center's Web pages, and even to creating a writing center T-shirt design. Over time, however, tutors began to perceive the face-to-face staff meetings as optional because there was an online space for discussion. Then, as the novelty of the new writing center Web space began to fade, so did participation in the virtual discussions held in the course-management system.

But this doesn't mean that tutor interactions ceased to occur. Rather, the tutors' online interactions through instant messaging, email, social-networking software, and even cell phones outside of the writing center were simply more appealing than any course-management system the university could provide. Much as a writing center director is a curious hybrid of teacher, boss, and administrator, undergraduate writing center tutors are curious hybrids—neither wholly teachers nor wholly students. Because peer tutors must negotiate this in-between identity, the peer-to-peer influence in writing center work is very strong. Top-down models of management and technology use violate the dynamics of the peer-to-peer mentoring network. The tutors adopted their own approaches to using information and communication technologies outside of the context originally created within the course-management system.

After looking closely at the mentoring relationships that characterized the tutors working in the writing center, Jeanne learned not only that online discussions failed to create the collaborative atmosphere she wanted, but she also learned that even regular staff meetings could not do that. The collaborations she wanted to occur happened, instead, in the daily face-to face working and social relationships among the peer tutors, which were then reinforced in meetings. Teachable moments happen in a writing center whenever a tutor encounters a situation that seems new to her, and she turns to fellow tutors and to the director for help. The ways tutors interacted with each other and with Jeanne in the writing center were much more natural and collaborative than anything online or even face-to-face meetings could duplicate, and they had the advantage of being in the moment and emerging when and as needed. The technologies Jeanne used needed to support those relationships and the collaboration already present.

Because the course-management system has tracking features, Jeanne could analyze which parts of the electronic workspace were used, by whom, how often, and when. Looking at how the tutors actually used the Web space showed that they valued the online space for their own purposes: catching up on discussions they missed, recalling what was decided at a meeting, accessing important archived documents, and locating support resources. Jeanne decided to follow the online needs of her staff as she did in her center—by behaving online more as her social role as a coach and mentor-to-the-mentors dictated, by providing what tutors needed, in the moment. Jeanne was right to believe that the tutors were quite comfortable interacting and maintaining community online. But she needed to use the technology they most wanted to use and were already incorporating into their daily lives to support the community building that was already going on, and to find ways to extend and enhance it.

Prior to Jeanne's creation of the staff online workspace, the writing center did not have ready access to writing program instructors' syllabi and assignments, and it did not have a large repository of resources for tutors to consult when working with clients, an organized archive of meeting notes, tutor development handouts, workshop materials, or a repository for tutor-created projects that everyone in the writing center could access at any time. Tutors needed access to this information to work with clients as collaborative partners, and to model information-gathering and problem-solving. The ability of the course-management system to organize resources and make them available at any time made it a valuable tool in the writing center—one that the tutors turned to frequently in sessions and on their own. Even as the use of the online discussion space for virtual meetings slowed, the use of the archived discussions and resources grew.

Jeanne now uses technology to support, enhance, and extend the activities of her writing center. Meeting twice a week with her staff to make sure everyone has access to one weekly face-to-face meeting, she posts all meeting materials on the course-management system, and discussions continue between meetings in the online space. This use of technology enhances an important goal of keeping the staff in communication, and sustains a sense of community that starts in the daily work of the writing center, develops in the weekly meetings, and extends itself between meetings through technology.

Just as tutors need to learn to occupy a curious hybrid identity between student and instructor, Jeanne needed to learn how to be a coach to coaches, and to occupy her hybrid identity online and in the physical space of the center. Failing to understand the middle ground of the cross-space social relationships is what caused Jeanne to misapply a technology in a traditional top-down manager mode. Jane Nelson and Cynthia Wambeam (1995) pointed out that “instructional computing demands a far different relationship between people and technology than does administrative computing” (p. 138). Because writing center directors straddle the instructional and administrative worlds, we can provide insight into the ways people use technologies across these spaces.

Story 4: Asynchronous versus Synchronous Online Tutoring

Our last story briefly examines some approaches to online tutoring, but because work with online tutoring recalls the historical positioning of writing centers as fix-it shops, we must first provide a bit more background to introduce the issues surrounding asynchronous and synchronous online tutoring. Since their inception, writing centers have struggled to define themselves as collaborative spaces for conversations about writing, rather than as proofreading repair stations, where students passively wait to have their texts “checked” for “correctness.” Stephen North (1984) rallied the writing center community when he said, “our job is to make sure that writers, and not necessarily their texts, are what get changed. . . our job is to produce better writers, not better writing” (p. 438). And, fortunately, over time, writing centers have successfully shed the campus image of drop-off editing services.

But, as we see it, online writing labs have renewed this struggle for many writing center directors, with many writing centers working hard to avoid constructing their online spaces as mere handout-delivery services, and many writing center directors struggling to craft ways for online tutoring to be as rich and conversational as face-to-face tutoring. At the same time directors see the potential of email, for instance, to improve student access to writing center tutors, we also see the potential to move backward in our pedagogy even as we move forward with technology. Muriel Harris (2000) articulated the problem this way:

> the invitation to students to engage in e-mail tutoring seems to bring with it the student tendency to ask a grammar question that reduces tutoring to grammar fixing, the Band-Aid approach to healing wounded grammar that writing centers battle against. Equally prevalent in having an e-mail service is the tendency for students to e-mail a paper with no accompanying contextual information about the assignment or the student’s concerns. (p. 198)

Tutors, as well as clients, are affected by the limitations of asynchronous technology. Even the most experienced tutor may struggle to interact with a client who is not physically present. Because an email-based OWL, according to Nelson and Wambeam (1995), has “only a limited capability for synchronous writing. . . the chances for this kind of conversation evolving into requests for editing seem high to most Writing Center staff” (p. 139). At Jeanne’s campus, a review of the tutor–client exchanges on her center’s email-based OWL showed that, without extensive training and retraining, even the best tutors found themselves editing student texts in email much more than they did in face-to-face sessions.

As technology has progressed, many newer options for collaborating online have emerged: chat, videoconferencing, voice-over-IP services, and virtual meeting software. The new tools seem to promise a way to provide online support for collaboration and learner-centered pedagogies. Harris and Michael Pemberton (1995) foresaw the potential of such real-time interactive technology:

> Synchronous chat systems *are interactive, realtime* systems. Depending on the sophistication of the technology involved, students and tutors can converse electronically, view a draft on screen, and/or share files and references online with one another as they collaborate. Again, depending on the sophistication of the technology available, it is foreseeable that several students and/or tutors could link simultaneously, all working on the same document in different ways. (p. 153)

Understandably, these now-available features are attractive because synchronous communication seems closer to a face-to-face meeting than asynchronous email exchanges. Jeanne’s writing center began to experiment with one such system, hoping to link tutors at the Kent campus to clients at a regional campus during times when the regional campus writing center experienced overload. The application’s impressive array of features included live video, audio, chat, and a shared desktop. In theory, it permitted the very interactions most valued in a writing center session. In practice, however, the software was difficult to install and maintain, poorly documented, and counter-intuitive.

Tutors tested the system over an academic year, wrote their own documentation manual, trained a core staff to run the virtual writing center, gained the enthusiastic support of a regional campus writing center director, and launched a marketing campaign to publicize the new OWL to students on the regional campus. However, more than a year after starting the project, not one student at the regional campus had used the new OWL. The regional campus students wanted more face-to-face-tutoring time with local tutors, not a computer link to remote tutors. In addition, because Jeanne’s campus was exploring other collaborative learning tools, and the package she had worked to develop could potentially lose its institutional support, she suspended the original project while investigating other interactive options. The center has returned to email tutoring with a renewed emphasis on continual staff development so as to ensure that asynchronous sessions remain focused, as North (1984) urged, on the writer and not the writing.

Tutors can learn to interact in email in ways similar to conversations in the writing center. According to David Coogan (1995), email tutoring, “another form of facilitative commentary, stresses the same idea of engaging the writer in a conversation—to open writing rather than to close it” (p. 176). Rather than using the commenting feature of word–processing software to mark up a text, a tutor might use the highlighting tool and refer to sections of the text in his open-ended questions in an email to the student. He might place fewer, directive comments in the text itself (or perhaps none at all), and instead ask leading questions of the writer in the email, opening the client to possibilities, and engaging conversation about his writing. “By turning their papers into acts of communication,” Coogan (1995) claimed, “e-mail can give students a genuine audience to break down the barriers between academic writing and conference talk" (p. 179).

When training focuses on helping tutors recognize the differences between an editing session and a collaborative conversation over a piece of writing, it matters less whether that exchange takes place across a table or through email. The successful social ecology of the writing center and its ethos can be extended across time and distance by an older asynchronous technology, something the failed synchronous project did not accomplish on Jeanne's first attempt. This does not mean Jeanne will cease to investigate the potential of synchronous technologies for use in the center's OWL, especially as synchronous collaborative technologies are becoming more prevalent, institutional support for them is blossoming, access is (slowly) increasing, and student interest and comfort levels with such technologies is rising. Institutions are investigating, and investing in, online collaboration tools as they never have before, and our choices will improve dramatically in the very near future. At Jeanne's campus, writing center staff have applied for grant funding to explore various new initiatives, including reviving the synchronous OWL project with an alternative software product. The difference now is that Jeanne approaches the OWL project understanding the user community's needs; she applies for external funding, so that the development of the OWL does not drain the writing center's already stretched resources; and, perhaps most significantly, she incorporates continual assessment of the project to examine how the technology impacts the social ecology of the writing center. This approach can be a heuristic for others, and perhaps can help to avoid expensive, disheartening false starts.

ASKING THE RIGHT QUESTIONS TO PILOT COMMUNITY-APPROPRIATE TECHNOLOGHY

Because writing centers traditionally work with the most marginalized learners on campus—people with disabilities, people who do not have easy access to the latest technology, and people for whom English is a second language—our sensitivity to the marginalized makes us think, perhaps more than most people on campus, about the technological winners and losers, and to refuse to exclude learners as we move forward.

As we investigate new tools and pilot new initiatives, we all need to remember the lessons of the writing center. Technology needs to be simple for users and accessible. Without that simplicity, technology—regardless of what it has the potential to accomplish—can function as a barrier to rather than a path of access. As writing center professionals who specialize in collaborative learning and in serving a diverse campus population, we think our voices are important in campus conversations about technology. As higher education focuses on becoming more learner-centered, and further explores the potential of collaborative technologies, the people who specialize in the dynamics of collaborative learning can provide leadership.

It is imperative that those implementing new technologies understand the social ecology of the community that will use it. As Blythe (1997) noted, "we need ways to continue to work with technology without feeling that we are trapped into a choice between accepting whatever comes our way or remaining adamantly anti-technological and thereby running the risk of falling behind" (p. 102).

Looking critically about when, how, and why some of our best efforts have failed, and analyzing the common elements of our successes has taught us a great deal. Now we would never ask questions we used to ask: What technology is available to me? Or, How can I use this new technology in my work? Or, What is the newest technology available, and how can I train my people to use it? Instead, we ask ourselves, What are the core functions in my group? What are the most important collaborative relationships in my community? What is the simplest, most sustainable, way to support them with technology?

When we think about technology now, we use a decision-making process. If we had thought about our uses of technology in this way before we made our mistakes, we both might have avoided some technological failures, and experienced more success from the start. It seems to us that a number of important questions should be asked *before* specific technologies are considered. When evaluating a new technology, these questions must be continually revisited. Our decision-making heuristic and sets of key questions appear in Figures 1 and 2 below.

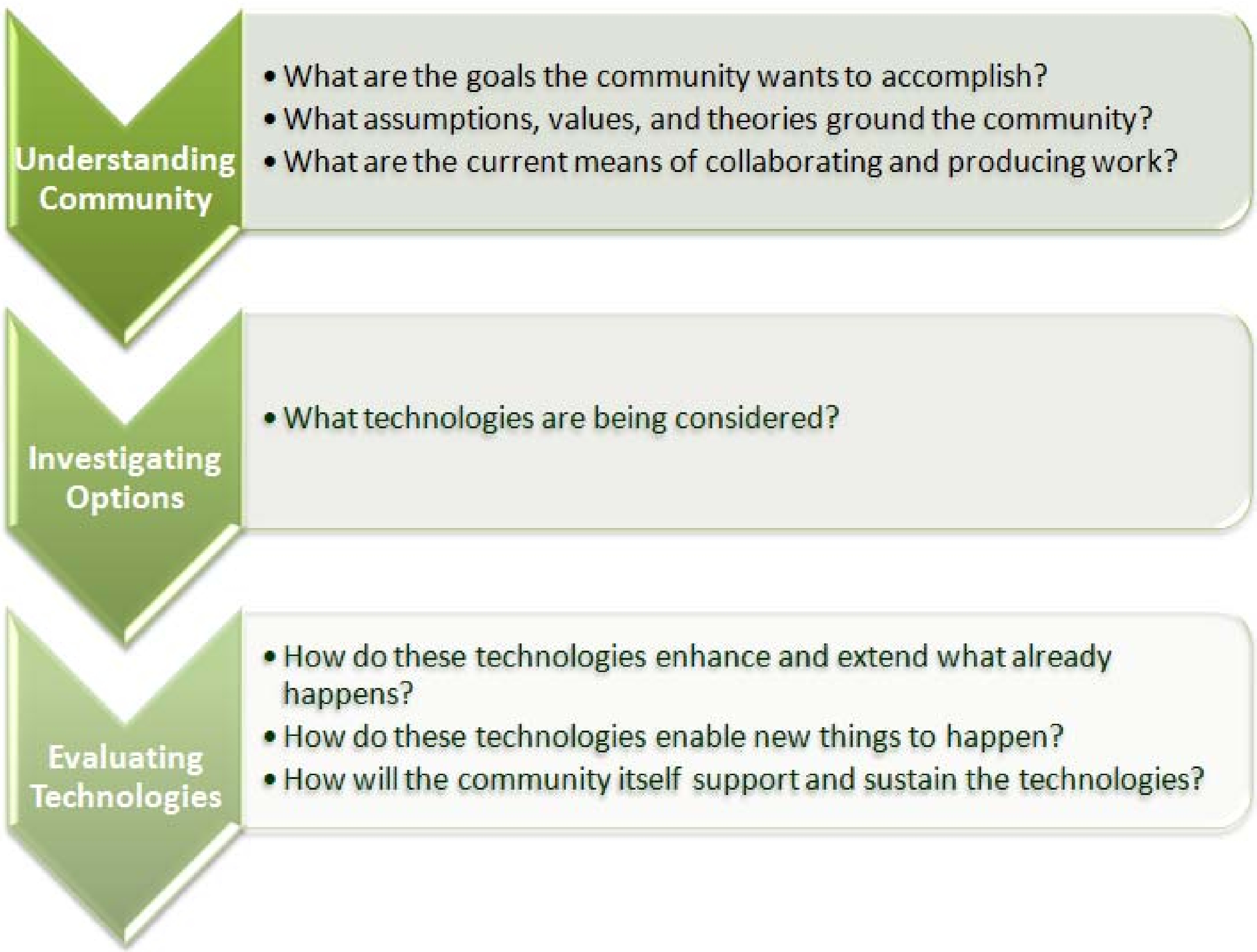
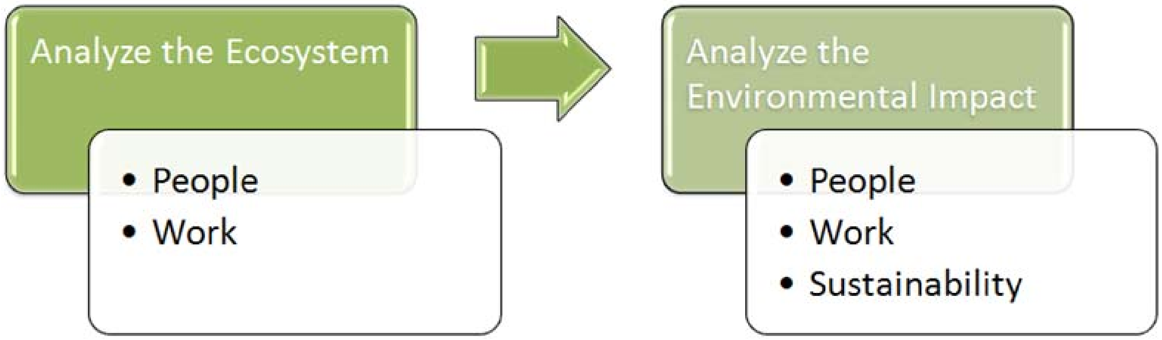


Figure 1. Decision-making heuristic.



Analyze the Ecosystem		**Analyze the Environmental Impact**	
• Who are the people in the community? • What are their relationships to each other? • How does each relate to people outside the community? • What roles or functions do different group members play? • What work or knowledge does the community produce?	• What makes the community a success? • What current modes of communication and/or collaboration do members use? • What are the needs of the people in the community? • What technologies are accessible to the people in the community?	• How natural will this technology be to those who will use it? • For whom is access to the technology a barrier? Why? • How will the technology support what you do and what you value most in what you do?	• What existing interactions and collaborations will this technology support or enhance? • What new interactions and collaborations will the technology make possible? • What alternative means exist to support and enhance these interactions and collaborations?
How will you maintain and support the technology?			

Figure 2. Technology-integration decision-making.

It is not enough to ask questions about the community before adopting a particular technology. We need to assess our efforts, change as needed in response to the community, and build upon successes. It is unrealistic to expect technological solutions to materialize complete with support personnel, and for those technologies to stay in place and remain functional indefinitely. Understanding both why technologies fail and why they succeed should inform institutional support allocated to new technological initiatives. If a technology is imposed on a community as a top-down decision or if a technology is adopted without first understanding the interactions and collaborations within the community, it will fail, even when the motivations seem valid and the tools seem appropriate. On the other hand, if the community that will use the technology is well understood, if the community has a use for the tool that fits with its own theories and modes of working, and if the technology adopted can be supported by that community from the inside, it will succeed—even if it is not the newest, most-sophisticated technology available.

For example, similar to Jay's use of the V-Tel classroom, Jeanne accepted the technology her university offered without considering it critically in relation to the people who would use it. As Cynthia Johanek and Rebecca Rickly (1995) cautioned, "using this available technology in a writing center merely because it is available is a dangerous application of an otherwise valuable tool" (p. 244). The kinds of tutor–client interactions Jeanne valued could not take place using software that functioned as a barrier to the very students she was trying to reach. We must strive to understand what users need, and search for the tool that accommodates those needs. We should never accommodate our writing centers—or our most-valued best practices—to any particular tool for the sake of the tool itself.

We think it is better to use an imperfect technology that is accessible and under our control than to invest time, energy, and expense in more sophisticated technologies that we may be forced to abandon, or that are too difficult for users to adopt. We have learned not to reject new technologies, but to approach them more cautiously and on a smaller, pilot-project scale while continuing to enhance our use of familiar technologies through continuous training. Staff training is within our control whereas the campus network and the software selected to populate our servers, many times, are not.

Technology can be empowering and it can be marginalizing. As Blythe (1997) noted, "the trajectory of its development is not fixed, but ambivalent. It can follow several paths. The purpose of critical theory is to affect technological development so that it follows more democratic, empowering paths, and this should apply to education as well as to industry" (p. 104). Examining successful and unsuccessful applications of technology in a writing center—because of its focus on interaction and collaboration, and its focus on marginalized populations—highlights how technology and community intersect in an academic setting. Our continued efforts to develop small pilot projects in our writing centers, to assess by collecting feedback from users along the way, to adjust in response to user needs, and to publicize successes will all contribute to growing sustainable technologies on our campuses and will, we hope, help those on other campuses to imagine, theorize, and implement sustainable technologies.

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CHAPTER	13
TITLE	Sustaining (and Growing) a Pedagogical Writing Environment: An Activity Theory Analysis
AUTHORS	Mike Palmquist Kate Kiefer Jill Salahub
OVERVIEW	In this chapter, we explore the use of activity theory (Engestrom, 1987, 1999; Leontiev, 1978) as a post-hoc framework for understanding how technology-supported writing initiatives come into being and as a predictive tool for sustaining those initiatives. We illustrate the potential application of activity theory by exploring the development of Colorado State University's writing Web site, Writing@CSU, paying particular attention to factors that have contributed to its emergence as a sustainable project situated within its institutional and extra-institutional contexts. We argue that activity theory—chiefly through its focus on interactions among individuals, communities, and tools—offers significant benefits to scholars in the field of computers and composition who wish to address the continuing challenge of developing and sustaining network-supported writing environments.
TAGS	act of composing, activity system, activity theory, activity, adapt*, assess*, building, cod*, community, community, composition, content, continuity, contradictions, contradictions, copyright, design*, division of labor, enduring, enhancement, evaluator, evolving, external funding, full-time, mismatches, hybrid, instructors, interactive forums, Jill Salahub, Kate Kiefer, labor, learning resources, long-term, Mike Palmquist, motive, multiple motives, object, open access, open source, outcome, positive effects, promotion, proprietary software, reports, research center, rules, rules, subject, subjects, teaching, technology specialists, tenure, tool, tool, tunnel vision, writing center, Writing Studio, Writing@CSU, writing-across-the-curriculum
AUTHOR BIOGRAPHIES	Mike Palmquist is professor of English, Associate Vice Provost for Learning and Teaching, and University Distinguished Teaching Scholar at Colorado State University, where he directs the University's Institute for Learning and Teaching. His scholarly interests include writing across the curriculum, the effects of computer and network technologies on writing instruction, and new approaches to scholarly publishing. His work has appeared in scholarly journals, edited collections, and books (including *Transitions: Teaching Writing in Computer-Supported and Traditional Classrooms,* which was written with Kate Keifer, Jake Hartvigsen, and Barb Godlew). With Jill Salahub and a host of WAC colleagues, he coordinates the development of Writing@CSU (http://writing.colostate.edu/)and the WAC Clearinghouse (http://wac.colostate.edu/). Kate Kiefer is a professor of English at Colorado State University where she teaches undergraduate composition and graduate composition theory courses. She developed her long-standing interest and expertise in computers and writing in the early 1980s when she co-founded *Computers and Composition*, of which she is still emeritus editor. She continues to research teaching in both physical and virtual computer contexts, but her most recent work has focused on studying the ways in which reading, writing, and thinking can be considered complex adaptive systems. Jill Salahub is the editor and programmer for Writing@CSU (http://writing.colostate.edu/). She also teaches an upper-division composition class focused on writing for the Web. Her research interests include computers and

	composition, the use of technology and hypertext/hypermedia in the classroom, professional development for teachers, creative nonfiction writing, and writing for the Web. She received an MA in Communication Development from Colorado State University in 2003, having been granted distinction for her thesis, a hypertext entitled "Fear, Happiness and the American Way: The Difficulty of a Simple Life." Her other Web writing projects are teaching and writing guides for CSU's Online Writing Center, Web-based textbook supplements for multiple publishing companies, and Web sites for various writing across the curriculum projects at CSU. Most recently, she's been focusing her efforts on providing professional development opportunities for teachers using such technologies as the Writing Studio to enhance and extend the environment of their writing classes.
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Sustaining (and Growing) a Pedagogical Writing Environment: An Activity Theory Analysis

Mike Palmquist
Kate Kiefer
Jill Salahub

As work on network-supported writing environments enters its third decade, scholars in computers and writing have begun not only to consider how to build and maintain these environments, but also how to understand the characteristics of successful long-term projects. While sustaining any instructional writing initiative requires extensive planning, implementation, assessment, and adaptation, sustaining initiatives that rely on significant technological infrastructure requires even greater attention to assessing and adapting to changing conditions. In this chapter, we explore the use of activity theory (Engeström, 1987, 1999; Leontiev, 1978) as a framework for post-hoc analysis through which we can understand how technology-supported writing initiatives come into being and as a predictive tool for sustaining those initiatives.

To illustrate the potential application of activity theory, we explore the development of Colorado State University's writing Web site, Writing@CSU; see Figure 1), paying particular attention to factors that have contributed to its emergence as a sustainable project situated within its institutional and extra-institutional contexts. Our discussion considers interactions among the site's developers regarding its conceptualization, development, and assessment. Here, we offer an overview of activity theory, describe the site and reflect on its development within the context of activity theory, and reflect on the use of activity theory as a framework for investigating computer-mediated writing environments.

Figure 1. The home page for Writing@CSU (http://writing.colostate.edu).

ACTIVITY THEORY

Activity theory considers the goal-directed, mediated activity of individuals within socio-cultural contexts.[1] It provides a framework within which actions—including the creation of texts—can be understood as goal-directed work situated within social, cultural, and historical contexts. Key concepts include:

Object:	The goal(s) toward which activity is directed.
Motive:	A socially constructed desire to address social needs by accomplishing a goal.
Activity:	Collective action taken to realize a goal. Sascha Barab, Michael Evans, Eun-Ok and Baek (2004) characterized activity as "a coherent, stable, relatively long-term endeavor directed to an articulated or identifiable goal" (p. 204).
Subjects:	People engaged in an activity.
Tool:	A vehicle for a particular method of social action. Tools may be material, such as pens or pencils, or psychological, such as signs or symbols (Barab, Evans, & Baek, 2004).

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[1] Activity theory emerges from work beginning in the 1920s that attempted to situate psychological inquiry within a Marxist framework, most notably by Aleksei Nikolaevich Leontiev, Lev Semyonovitch Vygotsky, Mikhail Basov, Sergy Rubinshtein, and Alexander Romanovich Luria. The fundamental contributions of activity theory include (1) its description of activity as goal-oriented, mediated work shaped by—and, in turn, shaping—social, cultural, and historical contexts, and (2) its characterization of the impact of activity on participants, tools, and contexts. The most comprehensive treatment of activity theory available in English is provided by Victor Kaptelinin and Bonnie Nardi (2006). A.N. Leontiev's (1978) book on activity theory is also available in English, but it is best characterized as a series of reflections on key concepts in activity theory rather than as a comprehensive treatment of its major tenets (see, also, Leontiev 2005a–k). Additional resources include James Wertsch (1981), *The Concept of Activity in Soviet Psychology*, which provided access to a range of work on the approach, and Yrjo Engeström's (1987) book, which usefully extended Leontiev's work by (re)viewing it through the lens of Vygotsky's cultural–historical theory.

Following the translation of Leontiev's work in the 1970s, activity theory gained attention outside of the Soviet Union. It drew the interest of scholars in human–computer interaction in the 1980s and 1990s (Cole and Engeström, 1993; Engeström, 1987; Wertsch, 1981; for a recent review of work in this area, see Bertelsen & Bodker, 2003). Engeström, drawing on work by Vygotsky, extended the theoretical framework developed by Leontiev (for useful discussions, see Miettinen & Kaptelinin, 2005; Russell, 2004). Educational theorists were also attracted to the theory, in part because it usefully extended the work of Vygotsky, particularly as it applied to understanding the zone of proximal development. Within writing studies, it has been seen as a means of problematizing discourse-community theory and has been applied in the study of text production among writers who do not share membership in a particular community. *Writing Selves/Writing Societies* (Bazerman & Russell, 2003), provides the most notable collection to date. David Russell has also written extensively about activity theory (see Russell, 1995, 1997a, 1997b, 1998, 2001).

Labor: A social process, involving tools, for influencing nature. Labor defines relationships among the people who carry it out (i.e., a division of labor; Russell, 2004).

Rules: Whether formal or informal, explicit or tacit, rules “shape the interaction of subjects and tools with the object. Of course, these rules can also alter, tacitly or explicitly, with changes in other nodes in the system, but the rules allow the system to be ‘stabilized-for-now’” (Russell, 2004, p. 315).

Community: People who act on a common goal over a period of time form a community; communities, in turn, condition other elements in the activity system (Russell, 2004).

Contradictions: Contradictions emerge from changes in an activity system and can place people at odds with each other or cause them to question their actions or beliefs. Quoting Yrjo Engeström, Russell observed that, “an activity system ‘is constantly working through contradictions within and between its elements’ (Engeström 1987)” (2004, p. 316).

One branch of activity theory (following Vygotsky’s lead) focuses more on the individual or subject involved in the mediating activity, while a second branch (following Leontiev) focuses on the objects of activity.[2] Leontiev’s approach has been characterized by Engeström as involving a more complex interaction of subject, tool, object, outcome, rules, community, contradictions, and division of labor (see Figure 2). We believe this model is likely to prove effective for understanding the interactions of the large numbers of subjects typically involved in developing and adapting the complex set of writing tools found in network-based writing environments such as Writing@CSU.

[2] The development of activity theory over time can be viewed as a movement from Vygotsky’s focus on the individual (or *subject*) involved in mediated activity to Leontiev’s focus on the *object* of activity. Both approaches offer a means of understanding the social and individual development of the mind within cultural–historical context, and in so doing both approaches offer an important alternative to the behavioral psychology that dominated much of Western psychology in the early-to-mid 20th century. They differ, however, in their emphasis on the individual. Vygotsky focused on individual actions—and the cognitive and social development accompanying those actions—within a given context. In contrast, Leontiev focused on the object of activity. That is, he understood the development of the individual (and, importantly, the formation of social structures) as a function of the goals toward which activity was directed.

Vygotsky’s model is typically characterized as a triad of subject, object, and mediating tool. It reflects his understanding of learning as a process in which “humans and their environment mutually transform each other in a dialectical relationship” (Barab et al., 2004, p. 200).

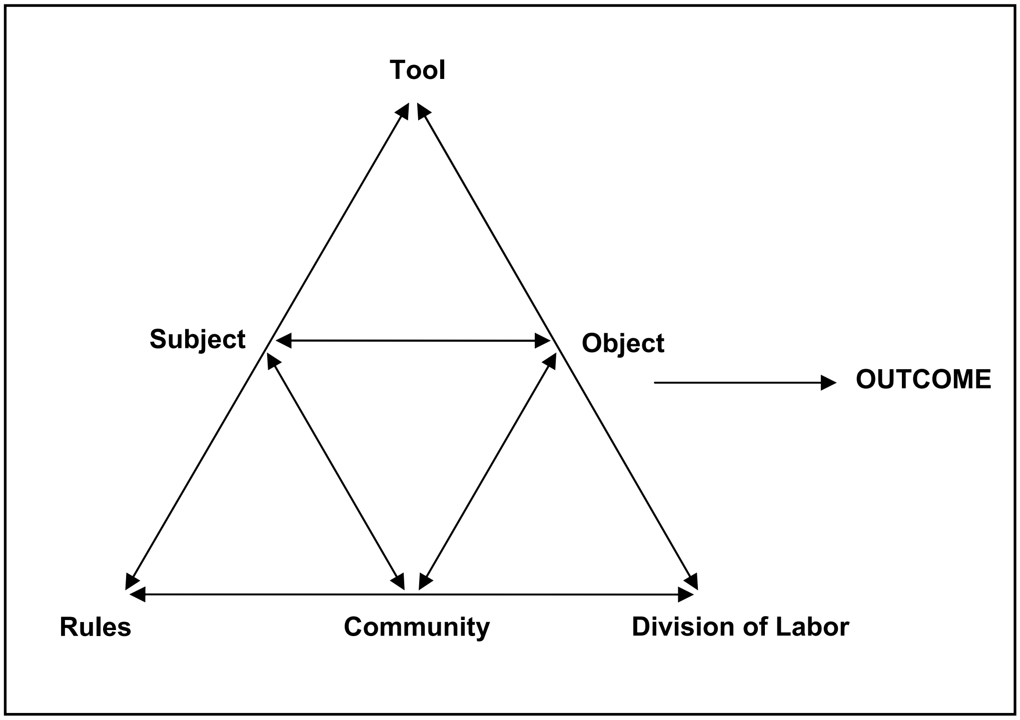

Figure 2. Engeström’s elaboration of Leontiev’s activity theory.

Engeström defined outcome as the implication (intended or not) of activity. Following Leontiev (see, for example, A.N. Leontiev, 2005j), Engeström characterized activity as collective labor. For example, the collaborative process of designing and developing a new video game would be considered an activity. Similarly, barn raising would be viewed as an activity. Activity is built up from actions, which are carried out by individuals. In isolation, actions would not allow the overall object (or purpose) of the activity to be realized; it is only through collective action that the object of activity can be realized. Thus activity can be understood as occurring at the social level, and actions can be understood as occurring at the individual level. Actions, in turn, are built from operations, which can be understood as physical movements or mental processes (see, for example, Leontiev’s discussion of thinking and activity, 2005d).

Leontiev carefully argued that the social does not dictate individual cognition. That is, the members of a group engaged in an activity will not think in precisely the same way or react identically to events. However, Leontiev also argued that our understanding of the world is mediated through language and, more specifically, communication, which is necessarily social (see his discussion of Vygotsky’s treatment of this issue in Leontiev , 2005i). These differences in understanding give rise to contradictions, which can occur at numerous points in an activity system and which Engeström characterized as occurring within the nodes of his model (e.g., within a tool or within the object itself), between nodes (e.g., between subjects and tools), and between related activities and activity systems. (For a review of these types of contradictions, see Barab et al., 2004.) With this brief theoretical overview in place, we can turn to our specific case—the development of Writing@CSU—to illustrate activity theory and its implications for building sustainable network-supported writing environments.

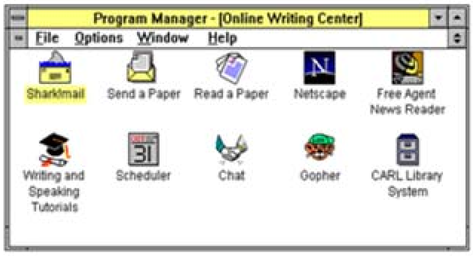

Figure 3: The Online Writing Center was initially available as a campus network application, running on Windows 3.x.

Figure 4: Guides provided instruction on a range of writing processes and genres.

Figure 5: Writers could send drafts via email to instructors, other writers, and writing center tutors.

THE DEVELOPMENT OF Writing@CSU

The Writing@CSU Web site is a comprehensive Online Writing Lab (Lasarenko, 1996) that supports Colorado State University's composition program, writing-across-the-curriculum program, and writing center. It provides access to guides for writers and writing instructors, an annotated list of links, interactive activities, information about upcoming workshops for students, and information about visiting or sending drafts to consultants in the campus writing center. The site also houses the Writing Studio, an instructional writing environment used at the university and by a number of other institutions in the United States and abroad. In 2008, when this chapter was written, writers from more than 900 institutions had logged into their Writing Studio accounts in the previous 12 months, and instructors at more than 100 institutions had created Writing Studio class pages. In 2008, the Writing@CSU site included roughly 35,000 static pages. In addition, approximately 1,200 dynamic pages provided access to content housed in the Writing Studio's databases. The Writing@CSU site as a whole had received more than 4 million visits in the past year included in this total were more than 900,000 visits from 21,000 active account holders in the Writing Studio. From 2004 through 2007, use of the Writing@CSU site as a whole grew at an annual rate of roughly 30 percent, and logins to the Writing Studio increased at an annual rate of 50 percent.

The comprehensive and well-used set of tools available through the Writing@CSU developed over time through the coordinated efforts of many contributors.[3] The Writing@CSU project began in 1993[4] as part of an effort to develop a campus-wide writing environment to support

[3] Development of the Writing@CSU Web site and the Writing Studio is coordinated by Mike Palmquist in consultation with colleagues in the University's composition program, writing-across-the-curriculum program, and writing center. Jill Salahub serves as chief programmer for the site. Technical support is provided by the University's IT staff. Funding for server equipment and software is provided through student technology fees and program funds. Since its inceptions, more than 300 writers have contributed content to the site. These contributions include work for hire production, work completed in fulfillment of course projects, and work completed as part of graduate theses and other research projects.

[4] The Writing@CSU project emerged from related projects at two universities. In the late 1980s, Mike Palmquist had been working on his doctorate in rhetoric at Carnegie Mellon University. His association with Christine Neuwirth and Richard Young acquainted him with their work on a project that would have led, had it been funded, to the development of a

writing-across-the-curriculum and composition programs. Development was funded jointly by the state of Colorado and the university from 1993 to 1997. Since that time, funding for development and equipment has been provided by the University. In 1993, following a year-

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campus-wide, network-based environment that allowed writers to seek and receive feedback on their writing. Mike's work at Carnegie Mellon also involved the study and use of a range of network-based writing tools developed by Neuwirth and her colleagues, including Comment, CECETalk, Notes, and the Prep Editor (see Neuwirth, Kaufer, Chimera, & Gillespie, 1987; Neuwirth, Kaufer, Chandook, & Morris, 1990; Neuwirth, Kaufer, Keim, & Gillespie, 1988; Neuwirth, Palmquist, & Gillespie, 1988; Neuwirth, Palmquist, & Hajduk, 1990). At about the same time, two projects at Colorado State University provided additional foundations for the Writing@CSU project. Since the late 1970s, faculty in the English department at Colorado State had been involved in a writing-across-the-curriculum initiative. One of the faculty involved in the initiative was Kate Kiefer, a specialist in computers and writing. With Dawn Rodrigues, Kate had been exploring the use of computer networks to deliver instructional materials and analyses of student drafts. The Electronic Writing Service (Rodrigues & Kiefer, 1993; Rodrigues, Kiefer, & McPherson, 1990) was intended to provide an environment where "students can 'talk' in writing to one another or to a tutor, a place where they will also be able to locate appropriate writing software to help them with a writing assignment in any of their courses" (Rodrigues & Kiefer, p. 223).

In 1990, Mike joined the faculty at Colorado State. Not long after his arrival, he was asked by Dawn Rodrigues and Don Zimmerman to collaborate with them on the development of a writing-in-the-disciplines project in electrical engineering. Kate Kiefer subsequently joined the group and the four faculty sought support for project development from Loren Crabtree, then associate dean of their college. Crabtree provided support in the form of a part-time graduate research assistant and encouraged them to seek funding of their project. Funding was subsequently obtained through an internal grants competition intended to identify "programs of research and scholarly excellence" (PRSE) at the University and from the Colorado Commission on Higher Education (CCHE) Programs of Excellence competition. The PRSE funding supported the formation of an interdisciplinary research center that continues to receive funding from the University. The CCHE funding, which totaled $400,000 over 5 years, allowed the planning group to assemble a project team involving faculty and graduate students from the departments of English, Journalism and Technical Communication, and Communication Studies (then named Speech Communications).

Following a year-long assessment of the use of writing in engineering and composition courses, a national study of professional engineers' perceptions about the role of writing in their professional lives, and a study of the roles and uses of writing in a leading software engineering company, the project team held a retreat to review results of the studies and plan the development of a writing-across-the-curriculum program. At the retreat, decisions were made to develop a WAC program that departed from the approach that, to that point, had been followed at the University. Rather than focusing solely on faculty development, the new project would adopt an integrated approach to WAC (Palmquist, 2000; Palmquist, Kiefer, & Zimmerman, 1988; Palmquist, Rodrigues, Kiefer, & Zimmerman, 1995) that relied both on traditional WAC strategies for faculty development and on direct outreach to students through a revitalized campus writing center and an "online writing center."

In 1993, work began on a network-based application that allowed students to contact instructors and writing center tutors via electronic mail, submit drafts for review by writing center tutors, view instructional materials about writing in the disciplines, and work on interactive writing tutorials. Developed in Asymmetrix Multimedia Toolbook, the Online Writing Center was available on roughly 400 computer across campus.

long assessment of writing needs and expectations at the university and in organizations employing university graduates, what was at that time called the Online Writing Center was launched as a campus-network application (see Figure 3).

The Online Writing Center provided access to instructional materials and allowed students to submit drafts or send email messages to consultants in the campus writing center (see Figures 4 and 5). In 1996, the Online Writing Center was moved to the Web[5] (see Figure 6). In 1999, work began on the Writing Studio instructional writing environment (see Figures 7 and 8). In December 2004, the Writing Studio was publicly announced and was made available to writers and writing instructors outside the university (see Figure 9).

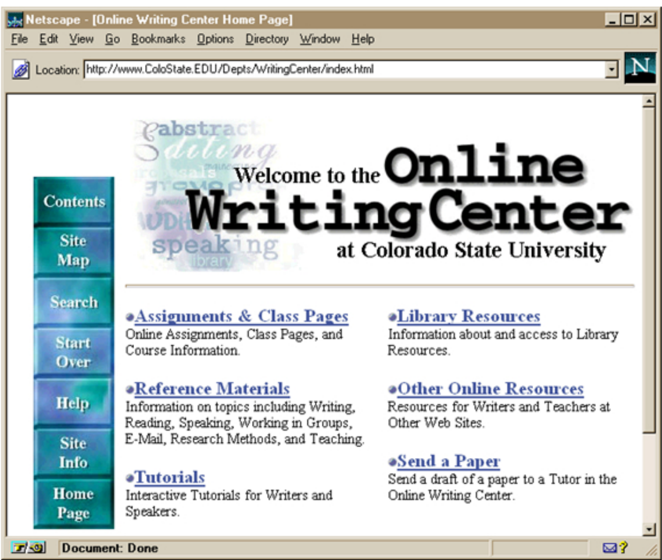

Figure 6. In 1996, the Online Writing Center moved to the Web.

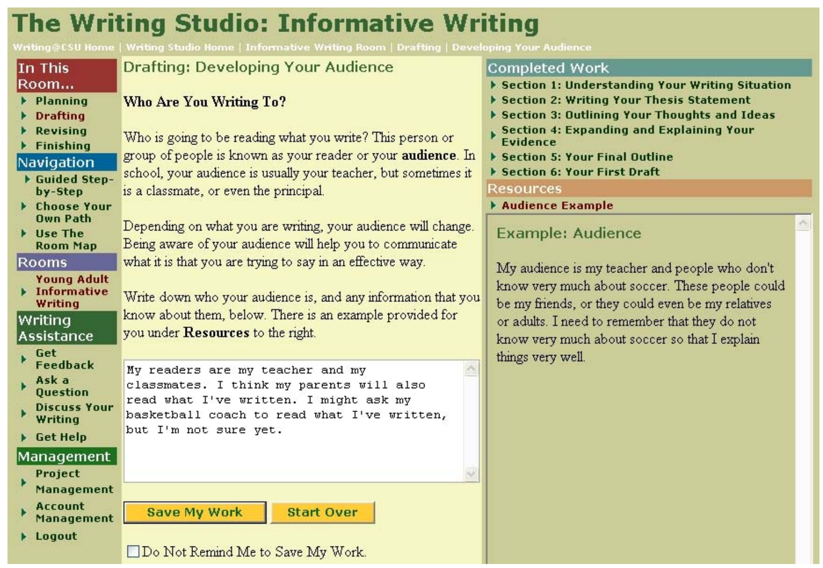

Figure 7. In 1999, a prototype was developed for the Writing Studio.

UNDERSTANDING Writing@CSU THROUGH AN ACTIVITY SYSTEMS FRAMEWORK

We believe that activity theory can provide a framework within which we can understand the development of Writing@CSU and its Writing Studio as “a coherent, stable, relatively long-term endeavor directed to an articulated or identifiable goal” (Barab et al., 2004, p. 204). Within the context of activity theory, development of the site can be seen as a form of tool development (Leontiev, 2005j), and the work of establishing and maintaining the site can be understood as a sustained effort to adapt the site to the needs—both enduring and evolving—of writers and writing instructors. Development of the site can also be understood as activity that stands in relation to other activity systems at the university and in the larger field of

[5] By 1999, the Writing@CSU Web site had become the largest Web site supporting writers and writing instruction, with more than 25,000 pages of instructional material. (By 2004, the number of pages on the site grew to more than 65,000; later that year, a redesign reduced the size of the site to roughly 27,000 pages. It currently contains about 35,000 pages.) Throughout the 1990s and into the early 2000s, the site could be characterized as a comprehensive online writing lab (Lasarenko, 1996).

composition studies, and which pursues related (and sometimes nested) goals, such as preparing students to succeed at the university, providing qualified graduates to the community, studying the use of technology to support writers and writing instruction, and developing instructional technologies.

Leontiev (2005j) observed that a tool "is the vehicle of a certain method of action, and, moreover, a social method of action, that is, developed in the joint activity of people" (p. 66). He noted that building a tool can "become a goal toward which action is directed" (p. 66). Viewing the creation of the Writing@CSU Web site and its Writing Studio as the creation of a tool—or, perhaps more accurately, a set of tools—allows us to understand it as a historically situated project that produces outcomes that serve as tools in related activity systems (e.g., supporting instruction in a writing class, educating students in a composition program, supporting the professional development of writing instructors). It is possible, as a result, to explore the creation of the site as an activity system in and of itself, and to view the site as a collection of tools (e.g., as a set of instructional materials, as a set of communication tools, as a course management system, as a system of storing and distributing written work).

Figure 8. In 2002, the Writing Studio moved into a beta version.

Figure 9. In 2004, the Writing Studio was released as an application running inside the Writing@CSU Web site.

Below, we focus on the Writing@CSU project as an activity *system*, rather than on its use as a tool in other activity systems. Our analysis focuses on the subjects who participated in the development of the site, the community they formed (as well as the larger communities in which they also participated), the actions they carried out as they developed the site, the rules that shaped their actions, the object of their activity and its motives and outcomes, the tools used in the creation of the site, the division of labor that distributed the actions across subjects, and the contradictions that arose and shaped the overall direction of the project. Given the genre constraints of a chapter, the following analysis is illustrative rather than exhaustive.

Subjects, Community, and Rules

The initial development of the Writing@CSU project was carried out by a group of faculty and graduate students drawn from the departments of English, Journalism and Technical Communication, and Communication Studies (then Speech Communications) at Colorado State University. Over time, the number of people involved in the project grew to include professional staff, artists, and roughly 300 writers who contributed documents to the project. It is difficult, given the scope of this project, to consider this group a single community, in the typical sense offered by activity theory. Instead, it might be more appropriate to consider the core group of individuals who planned and oversaw the development of the project as the community most responsible for the outcomes of the project, joined by writers who moved in and out of the community as they developed tools for the site. This smaller group was influenced by their participation in prior communities, such as the research group led by Christine Neuwirth at Carnegie Mellon University, the faculty involved in the early WAC program at

Colorado State, and the group of faculty and information technology specialists who worked on the Electronic Writing Services project.

The members of the community who designed and oversaw the development of the Writing@CSU project also had, as is always the case, memberships in related communities, and the rules governing their participation in those communities strongly influenced activity on the Writing@CSU project. These rules included the reward systems for tenure and promotion in their respective disciplines, the expectation that scholars acknowledge work drawn upon to design and develop the project, the expectation that external funding be sought for projects, the need to report to and keep administrators informed, and so on. Other rules were developed within the project, such as the need to write documents that followed a particular style, to design the documents using an agreed-upon set of templates, and to code those documents using a set of agreed-upon procedures.

The activity theory framework developed by Leontiev and elaborated and articulated by Engeström suggests a number of avenues for exploring the notion of sustainability within an activity system. In reference to subjects and community, situating the project within a research center informed strongly by a long-standing, stable composition program allowed participants who had already developed a sense of community to re-form around the new project. Building on the shared values they had already drawn on or formed in prior collaborative work, they were able to integrate the Writing@CSU project into their scholarly lives in ways that allowed it to be viewed as normal and reasonable work. For example, scholarly articles and presentations at conferences about the project were among the outcomes of the project, and the faculty and graduate students who produced those documents viewed them as a valuable contribution to (and expression of) their scholarly lives.

Equally important, the involvement of departmental, college, and university administrators in the early stages of the project, combined with a conscious decision to keep them actively involved in its development, led to long-term funding for the project that has continued for more than a decade after the end of the grant that first supported the project.

The adoption of rules consistent with practice in other areas of the project teams' professional lives, as well as the development of rules regarding the day-to-day practices of building the site, also contributed to its sustainability. In activity theory, rules govern practice. When practice is both regularized and meaningful to subjects, fewer conflicts are likely to arise between the motives and goals of participants and the actions in which they engage. By developing reasonable and appropriate rules for actions such as coding, writing, and designing documents, project participants are likely to feel that their actions are valued and relevant to the success of the project.

Actions, Tools, and Division of Labor

The members of the core community in the Writing@CSU project engaged in actions that contributed to reaching the goals of the overall project. These actions included, among others, designing the overall project, designing the studies carried out during the project, assessing progress on the project through usability testing and classroom assessments, designing writing guides and activities, designing composing tools, designing the commenting system, designing the course management, assigning writing projects, writing materials for the site, coding materials and tools, maintaining the server, working with administrators and information technology specialists, training faculty, and responding to queries about the site from internal and external audiences. To carry out these actions, members of the project team drew on a range of tools, not least of which, given the nature of the project, was written language. Included among the tools used regularly by—and shaping the actions of the subjects carrying them out—were the research methods they employed to conduct studies; communication tools such as email, chat, video conferencing, and the telephone; word-processing, image-editing, video-editing, and coding software; operating system and database software; video cameras and audio recorders; transcription machines; desktop computers, laptops, and Web servers; and so on.

A careful analysis of the manner in which any one of these tools mediated the actions of subjects in the Writing@CSU project community as they pursued the goals of the project might serve as the foundation for a chapter in and of itself, so we will avoid a comprehensive analysis. Consider, however, the importance of choosing to move from the use of Asymetrix Multimedia ToolBook as the delivery platform for the Online Writing Center in 1996 to the use of HTML and Web-browser-delivered content soon after. This change of tools had profound effects on the project. It reduced, for example, the project team's ability to deliver high quality interactive content to writers and writing instructors (given the primitive state of HTML and the Web at that time). At the same time, it reduced the complexity of distributing those materials on and beyond the campus. It also laid the groundwork for moving in the late 1990s from a static Web site to a dynamic, database-driven site. The decision to change the delivery platform also shaped the way the project team conceptualized the project itself. Rather than viewing it as a piece of software, we began to think of the Online Writing Center as a Web site, and to frame our thinking about its potential development within a framework consistent with what was then known about Web sites. For instance, the decision to publish on the Web, rather than to distribute the project via the campus network or on CD-ROM, shaped everything from the overall architecture of the site to the design of individual pages—and these decisions have continued to shape the site in significant ways even as the Web has matured to the point where it far outstrips the capabilities of the mid-1990s version of Multimedia ToolBook.

Division of labor, a key component of both Leontiev's and Engeström's conceptions of activity theory, is strongly related to the tools used to carry out the Writing@CSU project. It is clear that a strict division of labor (in a Marxist sense of management and labor, for example, or in the sense of an assembly line) was not typical of the project, particularly at its inception. Over time, however, and particularly as the project grew in scope, individuals began to take on more defined responsibilities for carrying out the project. Mike Palmquist, for example, emerged as the overall designer of the site and administrator of the project. Luann Barnes emerged as the lead programmer, and Jill Salahub took on that role when Barnes left after working on the project for 11 years. Don Zimmerman, who was associated with the project until the late 1990s, served primarily as its lead evaluator. Others, such as Kate Kiefer and David Vest, took the lead on a number of the research studies associated with the project. Still others served primarily as writers, coders, or artists. Over time, the project also relied on the efforts of accountants and information technology specialists, among other professional staff. It especially benefited from the efforts of writing instructors who provided feedback on the materials developed through the project.

Of these elements, the most important contributions to sustainability appear to have been made by decisions about the tools used in the project and the emergent division of labor as the project progressed. The decisions to rely on relatively easy-to-use development software, such as the scripting-language-based Multimedia Toolbook and, later, Allaire's ColdFusion database-integration tools, simplified the process of updating the site, re-using code, and moving to a database delivery system. The decisions to use proprietary software, although the subject of critique by members of the open source/open software community, also contributed to the project's sustainability. By following the hardware and software standards of the University (e.g., by using Microsoft server and database software), we have made it easier for the information technology staff at the University to provide support for the project, which in turn has resulted in a system that requires less maintenance and technical expertise on the part of the project team.

The division of labor has also contributed to the sustainability of the project. The decision to hire a full-time programmer and, later, a full-time writer, contributed to the early stability of the project. Over the life of the project, a number of writers have worked on a year-long or longer basis on the project, providing them the time needed to understand the instructional, organizational, and stylistic conventions of the materials developed for the site. The decision to allow one person to direct the development of the site has also resulted in a stable vision for the project, even as that person has worked with other members of the project team to refine and, in some cases, change the overall direction of the project.

Contradictions

Engeström's notion of contradictions provides a means of addressing Leontiev's observation that activities do not dictate the thinking of subjects involved in activity. Leontiev's attempt to understand the psyche within the context of activity does not appear to have been intended as an argument that all members of a community will think in similar ways. Kaptelinin and Nardy (2006) observed that

> It is important to mention that Leontiev specifically emphasized that the individual is not a carbon copy of culture and society. In particular, he pointed out that meanings live a 'double life' in the consciousness of the individual as both (a) meanings that objectively exist in a culture and are generally shared by individuals who belong to the culture and (b) 'personal senses' that are different for each individual. (p. 66)

Contradictions arise from the recognition of mismatches between the various elements of an activity system. The consequences of contradictions can shape a project in important ways. In the Writing@CSU project, several contradictions had positive effects on the direction of the project. In its formative stages, the recognition of a contradiction between the expectations of team members about the kinds of writing they thought would be assigned in engineering courses and in the engineering workplace and the kinds of writing that were actually assigned caused the project team to rethink their approach to supporting writing in engineering. Later, as we began to distribute instructional materials through the Online Writing Center, we recognized a contradiction between the goal of protecting the work of individual writers who had contributed to the project (i.e., the notion of copyright) and the need to make information easily available. This contradiction led to a decision to leave the copyright with the writer, but to ask for the "right to distribute" the materials created. Still later, the contradiction between the goal of making the Online Writing Center available to as many members of the Colorado State University community as possible and the limitations of the stand-alone software package used to deliver it contributed to the decision to distribute the instructional materials via the Web.

Perhaps most important, a contradiction between the original design and how students used the site and its resources led to one of the most significant changes to the project. Concerns about the overall direction of the project in the late 1990s led to a significant reconceptualization of its mission. Critiques by scholars such as Eric Hobson (1998) about the instructional focus of many OWLs, and observations by scholars such as Eric Crump (2000) concerning the limitations of existing OWLs, as well as the recognition that, aside from online submission of drafts, the site was providing (albeit in a more accessible form) materials that could easily be distributed in print, led us to question the value of continuing to follow the development path we had chosen. Although the overall project had been successful—the campus writing center had, as had been hoped, emerged as the focus of a community of writers on campus and students and instructors were making extensive use of the materials available through the Web site—the value of continuing to focus primarily on the development of additional instructional materials was called into question. Our discussion was strongly influenced by the results of a year-long study in which the same teachers had taught the same class in computer-supported and traditional classrooms (Palmquist, Kiefer, Hartvigsen & Godlew, 1998). The study found that students in the computer-supported classrooms appeared to benefit from access to writing tools, network resources, and feedback from peers and instructors during the act of composing. Taking a cue from those results, we began to ask how the Writing@CSU Web site might be used to support student writers in the act of composing. We decided to begin developing a writing environment, subsequently named the Writing Studio, to provide that kind of support to writers.

Contradictions encourage sustainability by calling attention to the need for changes in elements of an activity system. In an activity system with the duration of the Writing@CSU project, contradictions offer a means of identifying needed change. Without a way to identify useful adaptations, members of a project team might come to feel that their work is of little consequence. Worse, they might continue working in unproductive and perhaps counterproductive ways. Without the recognition of contradictions, the Writing@CSU site might have remained a “full service OWL” and the Writing Studio, which has provided a means of continuing engagement among the project team members, might not have emerged.

Object, Motives, and Outcomes

The object of an activity system is a goal or set of related goals; these goals are a response to a particular motive. The effort to achieve the goals leads to specific outcomes, which might or might not reflect success in meeting the goals and might or might not be consistent with the motives informing those goals. To understand the interplay of object, motives, and outcomes in the Writing@CSU project, it is useful to begin with the overall motive that informed the project: the initial desire on the part of the initiators of the project to create a means of supporting the use of writing in courses across the disciplines, and in particular in engineering. This motive is informed by a constellation of professional and personal values about the appropriate behaviors of writing instructors, the relationships between composition programs and other departments, and the potential role of writing-across-the-curriculum programs in higher education. The object of the Writing@CSU project—initially, to create a technology-supported WAC program housed in a writing center and coordinated with the University’s composition program, and later to develop a Web site supporting writers and writing instructors at and beyond the University—was strongly informed by the motive. As the motive changed over time, the object changed as well. And as the outcome was understood, and in the early to middle stages of the project, found lacking, the contradiction between the outcome, the object, and the motive led to changes in the overall direction of the project.

Activity theory appears to imply a single object, or at least a set of related goals. However, it seems possible that complex activity systems, such as the Writing@CSU project, might be able to accommodate multiple motives informing a particular object. For example, some members of the project team were motivated by a need to respond to a particular problem: that is, improving the quality of writing among students in the disciplines. Others were motivated by a desire to study the use of technology to support writing instruction. An overlapping motivation, for many of the participants in the project, was the publication of scholarly work that would contribute to their professional lives. It is not clear whether the notion of multiple motives is accommodated within Leontiev and Engeström’s conception of activity theory, but the Writing@CSU project appears to offer an example of a complex project informed by multiple motives.

Enduring motives appear to be among the most important elements of sustainability in the Writing@CSU project. One of those motives is the desire to use technology to support writing instruction in composition courses and in courses across the disciplines. This motive has allowed a number of key participants to continue to see value in the project, and it has enabled the institution to view the project as consistent with its overall motives of educating students and preparing graduates for participation in the larger society. On an individual level, the concept of enduring motive has been important as well. The project coordinator decided in the late 1990s to focus a significant part of his scholarly work on this project. His motive, at least in part, was to build a scholarly career around the project. That decision allowed him to think more fully about the implications of the project than might have been the case had he viewed it simply as an administrative assignment or some other form of service.

ACTIVITY THEORY AS A FRAMEWORK FOR ANALYSIS AND GENESIS OF COMPUTERIZED WRITING ENVIRONMENTS

What precisely do we gain by subjecting a decades-long development project to rigorous analysis with activity theory? In our view, the theoretical framework provides a perspective that reduces the tunnel-vision effect of snapshots of the project. Activity theory allows us to focus on interactions rather than on discrete elements. The theoretical framework also gives us a way to use the history of the project generatively to plan further enhancements, and, as we noted in the introduction, sustainability implies both continuity and enhancement, building and adapting.

Particularly important to us in this analysis is the balance of benefits to individuals and to the community. Any one member of the community might have specific goals governing his or her participation in the activity. For instance, a graduate student might want to write pedagogical or curriculum materials as part of a thesis project or might want to write Web texts as part of a portfolio of work to present to prospective employers. A faculty member might want to participate in the activity as a focus of specific research and scholarship. Another faculty member might choose to engage in the activity system as a way to facilitate student engagement in the classroom. Motives such as these are certainly not mutually exclusive, but the community as a whole can recognize that some contributors participate to fulfill different goals. Through division of labor, each participant can contribute to the overall outcome; through rules, each contribution conforms to the established conventions required for a coherent outcome. In the case of Writing@CSU, contributions from each participant become part of the whole, so that each contribution sustains those made by others.

Equally important is the notion that activity systems can be nested or interact in complex ways. We can view Writing@CSU as an activity system in itself with complicated outcomes and continual adaptations to changing technological and local conditions. But we can also see that Writing@CSU functions in relation to the composition program more generally, and that program in turn relates to the nested activity systems of the English Department, the College of Liberal Arts, and Colorado State University. And, of course, the University and its activity systems develop within the larger systems of higher education in Colorado (as governed by the state legislature and the Colorado Department of Higher Education) and higher education more broadly. We see multiple implications of this interaction among activity systems:

- Student writing isn't contained by the specific classes in which students enroll or the institution they attend. Yet the interactions between academic and nonacademic writing, between writing to learn and writing to maintain social contacts are not always exploited fully in a composition program. **The activity system model allows us to examine interactions among systems to better adapt objects for more productive outcomes for students.** To illustrate, in January of 2007, a major upgrade simplified the Writing@CSU interface and incorporated tools that reflect students' growing familiarity with and interest in social networking. After logging in, writers and instructors view a customizable “writing page,” from which they can access writing tools, saved work, classes and co-curricular experiences, learning tools, and instructional materials (see Figure 10). Account holders can also view information about writers with whom they have shared work or who are enrolled in their classes or co-ops.

- **Because the community is not limited to one geographic site, the system itself can recruit new community members over time and space.** For example, following the release of the Writing Studio as a resource accessible to writers and writing instructors beyond the University, a number of writing instructors investigated its use as a course management system at their institutions. Of these, the writing faculty at the University of California at Irvine proved most interested in the project. Beginning in 2005, they used the Writing Studio to support all first-year composition courses taught at their university. Because of their heavy use of the site, they became involved in its development, offering suggestions for new features (their suggestions, for example, led to the development of the blog tool) and exploring the use of resources at their institution to support its continuing development. By mid-2007, several other institutions were using the Studio regularly in their composition programs and, like the faculty at UC Irvine, were offering suggestions for improvements and expansion of its features. In March 2007, at the Conference on College Composition and Communication, representatives from several of these institutions met to explore the development of an open-source version of the Studio. Such extensions of the local community enhance the long-term sustainability of any writing initiative by sparking adaptation and refinement.

Figure 10. Writers are taken to a personal, customizable “Writing Page” when they log into the Writing Studio.

- **Activity theory can help scholars in the field of computers and composition account for the continuing challenge of developing network-supported writing environments.** When working within the framework of activity theory, for example, analysts are encouraged to recognize significant contradictions that, without attention, might sap the momentum of a project. By looking for contradictions and viewing them, when recognized, as potentially productive, we can consider what these contradictions might tell us about the overall direction and potential outcomes of a project. Similarly, activity theory calls attention to the importance of maintaining and nurturing the interrelationships that develop among members of the community/communities engaged in work on a project. In a project as complex and a team as large as that involved in the Writing@CSU project, for instance, it might be easy for members who view themselves as central to the project to think of the contributions of other members of the project community as somehow less central to the collective effort of the community to realize its goal. As Russell (2004) noted, however, labor defines relationships among the people who carry it out and communities, in turn, condition other elements in an activity system. It would seem that the complex interrelationships among the members of an activity system and their labor does not allow easy assignment of responsibility (or credit) for the realization of

> an activity system's goal. Rather, it reinforces an awareness of the interrelatedness of activity.[6]

There appear to be strong benefits associated with using activity theory to examine our efforts to support the teaching and learning of writing. In the case of the Writing@CSU project, viewing the writing environment we have developed as an activity system nested within and overlapping other activity systems has allowed us to better understand the directions we might pursue to sustain appropriate writing instruction, especially when that instruction—and related support—takes place in digital realms. Our experiences suggest that activity theory offers a powerful tool for both design and assessment. As such, it can make important contributions to our work as writers, teachers, developers, and scholars.

[6] Indeed, we might find it helpful to consider as members of that community not only those involved in its production, but also the students—who as a group are increasingly facile with new digital media forms—who used and in some cases provided suggestions for the refinement and expansion of the digital tools and resources that make up the Writing@CSU Web site.

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CHAPTER	14
TITLE	Genre-Informed Implementation Analysis: An Approach for Assessing the Sustainability of New Textual Practices
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OVERVIEW	The implementation of promising new writing technologies in organizations can be a difficult process, particularly for technologies with the potential to address many different organizational problems. To focus and direct implementation efforts, this chapter suggests evaluating pilot efforts with the help of a theoretically informed reflective tool. One such tool, based on North American genre theory, is described and applied to the case of a non-profit educational organization, Tech Year, and the organization's 16-month process of attempting to implement a new writing technology, digital storytelling. The reflective tool, or *genre inventory*, is described as part of a broader conceptual framework— *genre-informed implementation analysis*—for the implementation of new writing technologies and their attendant practices. North American genre theory has been most commonly used to diagnose writing and communication problems; here I suggest that the theory also offers a way to understand and focus the potential of new writing technologies in organizations.
TAGS	actual outcomes, analytical tool, apprenticeships, brainstorming, centrifugal, centripetal, challenges, cognitive, college writing, context, copyright*, digital storytelling, discourse, discursive, divergences, documents, field study, form, genre ecologies, genre inventory, genre stabilizations, genre, genre-informed implementation, intended outcomes, interview*, interviews, language, Lisa Dush, material, materials, media, methodology, music, new textual practices, norms, novices, observ*, organizations, practice, pre-inventory, production practices, protocol, reflective, rhetoric, royalty-free, social roles, social, structure, substance, texts, textual, themes, theoretically grounded, theory, topics, use practices, values, videotap*
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Genre-informed Implementation Analysis: An Approach for Assessing the Sustainability of New Textual Practices

Lisa Dush

In the fall of 2005, Madeline Davis, the writing director at Tech Year, a one-year educational and technical training program for 18–24 year old urban youth, attended a 4-day professional development workshop to learn a textual practice new to her and her organization called digital storytelling. Digital stories are 3–5 minute videos, typically personal in their subject matter and consisting of a first-person voiceover and music set to a slideshow of photographs. The video is assembled by the storyteller, using free or inexpensive video-editing software. Although not new, digital storytelling has recently caught the attention of many organizations, especially those with a mission of outreach or education. The digital story-making process has been shown to develop writing, computer, and personal reflection skills, and the digital stories produced within organizations can have great utility as training, promotional, and outreach materials (see Davis, 2004; Hull & Katz, 2006; Hull & Nelson, 2005).

Digital storytelling was attractive to Tech Year, particularly as a curriculum component. Tech Year is a nonprofit program for students with a high school degree or GED; it aims to ready these students, in one intensive year, for college and well-paid work in entry-level technical support jobs. The year begins with a 6-month “Learning and Development” phase, in which students take courses—many of them for college credit—in communication, professional skills, and technical skills. This phase is followed by a 6-month apprenticeship in a technical support job at one of the companies that partners with Tech Year.

The Business Communication course Madeline directed is taken by all students during the Learning and Development phase, and it has at least three primary and occasionally conflicting aims: to prepare students for the writing and communication tasks they will face at their upcoming apprenticeships; to prepare them for writing in college; and to help them work through the personal challenges of moving from their former lives into corporate or college culture. Digital storytelling seemed an appropriate fit with Tech Year’s academic curriculum, as making a story requires a blend of technical skills, writing skills, and personal reflection. Tech Year was also excited about many non-curricular uses of digital storytelling, and imagined, for instance, that staff members might create stories to be used for training, and that student-produced stories could be used for outreach and fundraising.

Like Tech Year, many organizations that attend digital storytelling training workshops find the practice compelling and leave the training eager to implement. But successful implementation and long-term sustainability of digital storytelling is extremely rare. In the case of digital storytelling, the difficulty seems connected, paradoxically, to the practice’s vast potential. Digital storytelling strikes people as easy, cheap, and full of possibility, but it is difficult to channel these possibilities into a focused and sustainable organizational practice. I was present at the training workshop Madeline attended, and I was looking for a case study site where I could explore the reasons behind why the implementation of digital storytelling so seldom works. Tech Year agreed to be this case study organization, and in December 2006, I began spending 5 to 25 hours each week at Tech Year, conducting interviews, observing classes and other activities, and attending all digital storytelling-related meetings and events.

All told, Tech Year spent 17 months engaged in fairly consistent implementation activity: eight more teachers were trained to teach digital storytelling, Tech Year’s founder and CEO made a digital story describing how his early mentoring experiences informed key values at Tech Year, and the organization piloted digital storytelling twice in the classroom. The first classroom pilot was an elective during the apprenticeship portion of the program; the second was a 7-week unit that used digital storytelling to explore the theme of personal empowerment in two sections of the Business Communication course. In the Business Communication pilot, 28 student stories were produced, and in March 2007 these stories were celebrated at a red-carpet premiere event attended by students, staff, corporate partners, and community members. Tech Year's founder and CEO opened the premiere with a speech on digital storytelling's role at the organization, outlining the many ways that the digital story was a fitting capstone project in the writing course.

In short, there seemed to be momentum for digital storytelling to continue at Tech Year. But in interviews I conducted 2 months after the premiere event, when I asked the question, "Do you consider digital storytelling to be implemented or institutionalized as of now?" interviewee answers revealed an incomplete and possibly stalled implementation:

> Madeline Davis, Writing Director: "I don't know. These next few months are going to be really telling."
>
> Cooper McCormack, Boston Executive Director: "It [the Business Communication pilot] feels like it was a huge win, [but] it's not clear that we can repeat it until we repeat it."
>
> Clark Cross, Boston Chief Academic Officer: "Nope, it's not institutionalized. Nope."

In fact, Madeline's prediction was apt—the next few months were telling. Without any fanfare, digital storytelling fell off of the organization's immediate radar and has yet to return. It did not disappear because staff or students were opposed to it, but rather because there was no clear sense of the best utility for the new practice. Tech Year's Chief Academic Advisor, Clark Cross, musing months after the premiere event, characterized it aptly: digital storytelling was, he said, "a solution looking for a problem."

Implementation of innovation in organizations and social settings is complex, and the failure stories are much more prevalent than the success stories. Jeffrey Pressman and Aaron Wildavsky (1984), public policy scholars who wrote one of the classic books on program implementation, offer a grim assessment of implementation feasibility:

> Our normal expectation should be that new programs will fail to get off the ground and that, at best, they will take considerable time to get started. The cards in this world are stacked against things happening, as so much effort is required to make them move. The remarkable thing is that new programs work at all. (p. 109)

In many ways, the progress that Tech Year made with digital storytelling in so short a time was remarkable, which makes it all the more disappointing that their efforts ended short of a lasting, sustainable implementation. And, interestingly, despite the CAO Cross' comment, digital stories and digital storytelling *had*, during various pilots, addressed a number of Tech Year's organizational problems. The founder and CEO's story made the organization's mission more clear, compelling, and memorable to potential donors, and proved to be an excellent fundraising tool. Students publicly praised each of the digital storytelling courses as a meaningful learning experience. And the digital storytelling premiere event engaged families in students' Tech Year lives, something that was typically very difficult to accomplish.

But regardless of these apparent successes, digital storytelling was not implemented. In the year- and-a-half since the digital storytelling premiere event, there has been no subsequent digital storytelling activity at Tech Year. And even if the organization were to be motivated to restart their implementation efforts, the 17 months of implementation efforts already completed offer little in the way of clear lessons. Although Tech Year was careful to retain all of their implementation-related materials—including meeting notes, project plans, handouts used to teach digital storytelling, and the digital stories that were produced—these materials are an archive with no story to tell or implementation direction to imply. Tech Year has no record of what pilots were successful and why, except for the memories of staff and students, many of whom, including Madeline Davis, have now left Tech Year.

What would have helped Tech Year—both during their implementation process and if they ever hope to rekindle their efforts with digital storytelling—is a theoretically grounded reflective and analytical tool that could be used to evaluate each digital storytelling pilot project. Not only would such a tool help the Tech Year staff make decisions about how to focus digital storytelling in their organization (i.e., to figure out what problem digital storytelling might be a solution to) it would also help them to think through what changes must be made to organizational practice and/or digital storytelling so that digital storytelling would be sustainable.

I argue in this chapter that one of the more familiar textual theories in English studies—North American genre theory—might be translated into such a reflective and analytical tool. For those familiar with North American genre theory, which has proven tremendously useful to both workplace and classroom writing researchers who aim to clarify the ways that recurrent text forms reflect and constitute workplace and disciplinary norms, the idea that genre theory can illuminate the dynamics of an implementation effort and provide implementers with direction might seem curious. Certainly, the theory has not been used this way before.

What I suggest is making use of the rich unit of analysis at the center of genre theory, the genre, by using it to periodically assess ongoing implementations of new textual practices. During such an implementation effort, a new textual practice with broad appeal—like digital storytelling—will likely be matched with a number of organizationally important recurrent situations and activities or problems looking for solutions. At Tech Year, these included the teaching situation, with the related exigence of finding an effective way to improve student writing and technical skills; the fundraising situation, with the related exigence of concisely and powerfully conveying Tech Year's message to potential donors; and the student development situation, with the related exigence of providing students with opportunities to prepare them for entry into college or professional lives. During an implementation effort, the suitability of digital storytelling as a response to these recurrent situations and activities are tested in pilots. When these pilots are deployed, we can assess them through the lens of genre theory, analyzing them as what I call *genre stabilizations*. Pilots, or genre stabilizations, are particularly fruitful times for research and insight, with much to reveal about how a new textual practice fits with or contradicts existing organizational norms, as well as the potential it holds to expand and refine the range of available individual action and organizational activity at the site.

I continue this chapter with a discussion of how and why genre theory can work to evaluate ongoing implementations of new textual practices. I elaborate in some detail the methodology for what I call *genre-informed implementation analysis*, describing the genre stabilization as a unit of analysis and focusing on how a reflective tool, the *genre inventory*, can be used to analyze pilot efforts during an ongoing implementation. I then briefly read some data from Tech Year using this reflective tool. Finally, I elaborate on what I see as one of the most important advantages of this approach: it encourages serious, long-term engagement with an innovation. This engagement pays dividends by both improving the odds that appropriate innovations are implemented and by helping the organization to scrutinize some of its pre-existing norms.

A GENRE-INFORMED MODEL OF IMPLEMENTATION

Genre theory, as a way to classify texts into categories, has been around since Aristotle's time. North American genre theory developed much more recently (beginning in the 1970s); its adherents suggest that genres should be identified not by their similar surface features, but by similarities in the social action they help individuals and groups to accomplish. Amy Devitt (2004) made a helpful distinction: whereas traditional genre theory would deem business letters a genre, regardless of where or by whom the letters are written, North American genre theory would label business letters written in a company setting one sort of genre and business letters written by students in a business writing course a different genre, because the social action accomplished by each text is different. Whereas traditionally the work of genre theorists was to study individual texts and argue a case for them as exemplars of a broad genre (the novel, the epic poem), the work of new genre theorists is to "explicate the knowledge that practice creates" (Miller, 1994, p. 27) by toggling between the study of texts that are repeatedly used in particular social settings and the social action that these texts facilitate.

Carolyn Miller's 1984 article is the classic reference in North American genre theory. Learning genres, says Miller, is key "to understanding how to participate in the actions of a community" (p. 39) as well as to understanding "what ends we may have" (p. 38) in particular social settings. As a simple example, consider one of Tech Year's important organizational genres (an oral genre): Friday Feedback. Friday Feedback happens each Friday afternoon at Tech Year, when staff and students gather together in a circle and share frank feedback—both positive and negative—directed at specific individuals. Most weeks, the feedback comments are initially focused on a fairly broad set of categories (e.g., time management, teamwork, communication), and the process is always run in an orderly manner, with one of the staff members first taking down a list of individuals who would like to speak and moving the process forward by moving down the names on this list. The practice is designed in large part to teach young people the art of constructive feedback and dialogue.

The genre of Friday Feedback allows members of the Tech Year community a range of action different from if Tech Year had no official genre for feedback, or if it used another model to mediate feedback. As a preview of the upcoming explanation of how textual innovations can be understood with genre theory, imagine if Tech Year did not always have Friday Feedback, if it was an innovation that successfully replaced a formal system of written grievances and no official system through which to give positive feedback. The new genre—Friday Feedback—would offer students and staff new social ends, new roles (for example, staff could more easily publicly praise their students; students could critique staff in a fairly low-stakes setting); it would also change the material circumstances of their interaction (from a system of paper complaints submitted to administrative offices to a recurring Friday afternoon event involving a circle of community members). In Miller's terms, the new genre would give both staff and students a different understanding of how to participate in the actions of their community and likely redefine their sense of what agency they may have as members of Tech Year.

North American genre theory was initially used primarily as a way to diagnose writing problems and identify communication possibilities in disciplinary and workplace settings. It is a particularly helpful theory for exploring the challenges that novices face as they enter new disciplines or workplaces and must work with unfamiliar genres (Beaufort, 1999; Berkenkotter & Huckin, 1995). Other researchers that engage the theory have traced shifts in academic disciplines by examining the changes in important genres (Bazerman, 1988), and have explored how individuals are constrained or empowered by the moves allowed to them in certain genres (Paré, 2002; Schryer, Lingard, Spafford, & Garwood, 2003; Winsor, 2003). Methodologically, North American genre researchers typically identify long-standing textual forms and both study samples of these forms and interview the genre's users.

Looking at textual innovations with genre theory requires a major shift, in that the focus is not on an existing, long-standing genre, but a *potential* genre—a response that *might* be paired with a number of recurrent organizational situations and activities. When the textual form—digital storytelling, in Tech Year's case—is piloted as a response to a particular recurrent situation, it *temporarily* approximates genre status. By analyzing these temporary genre stabilizations to see if and how the new textual practice fits, clashes with, or offers new possibilities within these recurrent situations and activities, implementers can get a glimpse of whether the new practice has potential as an organizational genre.

Additionally, North American genre theory is grounded in rhetoric, and it has been most widely used to account for what Miller (2007) called problems of "rhetorical production." Although my proposed analysis allows room for a discussion of the rhetorical work that individuals can and cannot do through digital storytelling, it is important to acknowledge that this vision of genre is not strictly rhetorical. Helpful for clarifying the way I propose defining genres is Peter Medway's (2002) examination of architecture students' sketchbooks. Medway makes a case for the generic status of these notebooks despite the fact that they do no explicitly rhetorical work (no one reads them except the authors themselves). Alluding to Miller's 1984 article, Medway argued that texts like these sketchbooks—which are recurrently used by architecture students to record their notes, sketches, and ideas—both 'socialize an urge' (p. 145) and help the students to 'enact the ends that they have learned they may have' (p. 145). He concluded,

> Genre theory may amount to little more than this; that it's helpful to be able to say that when people do roughly similar sorts of textual things in circumstances perceived as roughly similar, then we are in the presence of a construct that is a real social fact—and let's call that a genre. (p. 141)

It is with this looser definition of genre—genre as an indicator and nexus of real social fact—that I move forward.[1]

A genre-informed implementation analysis offers four key productive possibilities. First, the theory offers a lean methodology to implementation researchers, be they outsiders or implementing teams looking to document and learn from their own efforts. Implementation projects are often long and involve many people, meetings, and periods of activity. Genre-informed implementation analysis focuses the researcher's attention on pilot periods, because key information about implementation can be uncovered during pilots. Second, although genre theory itself is complicated, it can be translated into a fairly simple reflective tool—a *genre inventory*—that can be used to analyze and make decisions about an ongoing implementation. Third, genre-informed implementation analysis allows the experience of those who use the new textual practice, including the modifications they employ to the official version of this new practice, to be incorporated as implementation moves forward. And, finally, genre-informed implementation analysis forefronts the flexibility of both innovations and of organizations, reminding implementers of their power to make decisions about how to use a new textual practice and about what individual action and group activity they wish to make possible in their organization.

[1] See also Spinuzzi's work; Spinuzzi has justified the use of the genre as a unit of analysis when the object of focus is not clearly rhetorical. He defines a genre as a "temporarily stabilized social construct" (2003, p. 43).

A GENRE-INFORMED PERSPECTIVE

Genre Ecologies

Figure 1 represents a comprehensive genre-informed perspective on the implementation of a new textual practice. I unpack it slowly here, from the outside in, because it is both the key to understanding the view I propose and the basis for methods I later describe.

First, the entire system, bounded by the box, is an organization. Situated within the organization are many genre ecologies, that is, groups of genres that jointly mediate an activity or are available to individuals as they respond to recurrent organizational situations, or exigencies.[2]

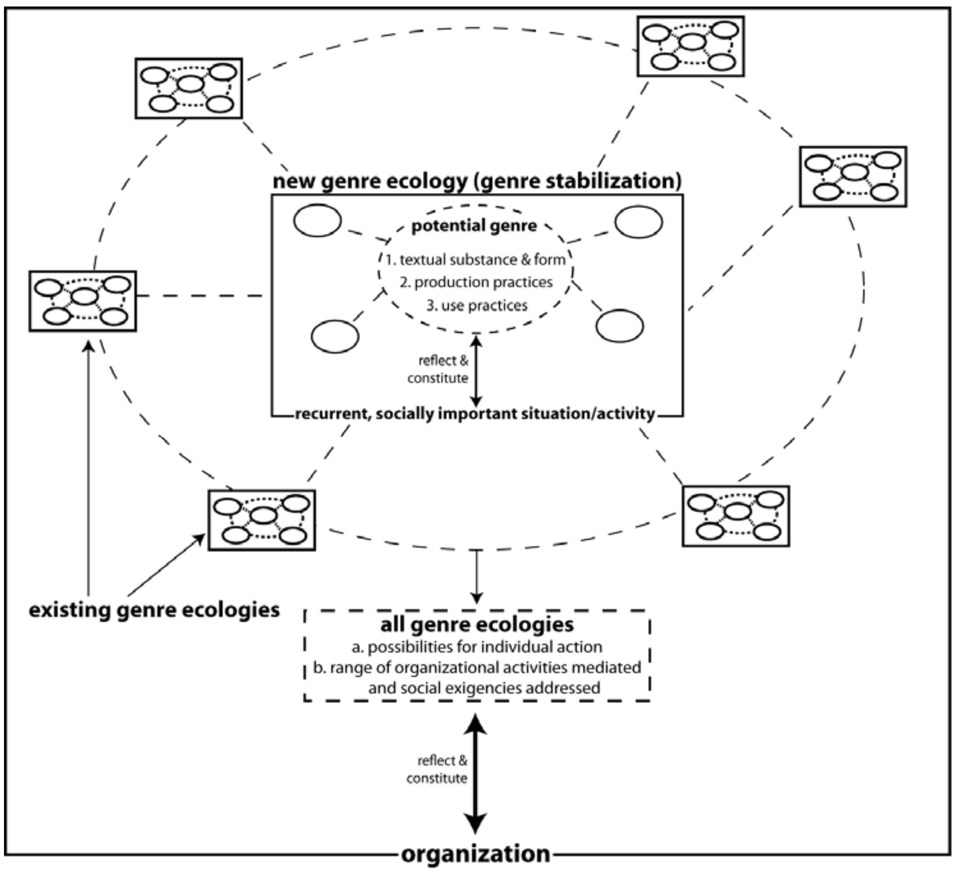

Figure 1. The relationship of genres—existing and new—to recurrent situations/activities and organizational possibilities.

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[2] There are many terms for collections of linked genres that people use to accomplish a particular end (Spinuzzi, 2004). I have selected “genre ecologies” (Spinuzzi & Zachry, 2000; Spinuzzi, 2003) because of all the available terms, it does the best job of suggesting that work and communication are facilitated not just by generic *texts*, but also by the social and material environment (ecology) that accompanies these texts. Ecology is also an evocative metaphor, as Nardi and O’Day (Nardi & O'Day, 1999) have described.

Figure 1 shows six existing ecologies, but any large organization will have countless genre ecologies. In the figure, all of the ecologies are connected by dotted lines, to show the overall interconnection of activities and exigencies and genres in an organization. The collective of these genre ecologies, labeled “all genre ecologies,” and the organization are connected by a double arrow. This designates the fundamental connection between an organization’s daily activity and its genre ecologies. Within these ecologies lie the possibilities for individual action within the organization and the range of organizational activities mediated within and exigencies addressed by the organization. That is, an organization and its genre ecologies mutually define or co-constitute each other—the genre ecologies reflect the organization and the organization reflects its genre ecologies. The “context” that is the organization is “an ongoing accomplishment” (Russell, 1997, p. 513) of people using genres. Of course organizations are made up of people, social roles, values, norms, materials, and discourse; most all of these contextual factors are linked to and realized within genre ecologies. Genres are, to invoke Blake, the grains of sand in which you can see the world. Or as the genre researcher Anthony Paré (2002) said, the genre is a nexus, “fus[ing] text and context, product and process, cognition and culture in a single, dynamic concept” (p. 57).

The large genre ecology at the center of the diagram represents a new genre ecology—a genre stabilization—temporarily formed when a new textual practice is deployed in a pilot. At the center of the ecology is the potential genre—digital storytelling, in Tech Year’s case—and it is surrounded by existing genres that individuals use to accomplish key activities or to respond to the exigencies of recurrent situations. Here again I use a double arrow to indicate the way that this ecology, with its new genre, will construct activity and situation, as well as how activity and situation circumscribe the possibilities for the potential genre.

Finally, at the finest level of detail, are three aspects of text and situation co-constituted within a genre and situation/activity relationship. In looking for ways to articulate these aspects, my main criterion was that the categories selected be comprehensive, yet few in number; I did not want a lot of categories to overcomplicate the analysis. The three aspects that I have selected—textual substance and form, production practices, and use practices—are built upon the “dimensions of genre” that Paré and Graham Smart (1994) suggested researchers studying genres investigate: textual features, writing processes, reading practices, and social roles. I have used Joanne Yates and Wanda Orlikowski’s (1992) more robust terms *textual substance and form* rather than “textual features.” I have also altered Paré and Smart’s terms “writing” and “reading” to, respectively, *production* and *use*, to reflect the digital nature of digital storytelling (and many textual innovations). More significantly, I have dropped Paré and Smart’s dimension of social roles. This choice reflects an understanding that an ecological approach to studying genre is one that incorporates the study of social and material factors into its analysis.

This model forefronts the fairly stabilized yet always flexible nature of organizations. And as far as models for organizational action go, a view of it as linked genre ecologies is fairly straightforward. As I will describe below, the model also points to a reflective tool that is similarly simple.

Evaluating a Pilot with the Genre Inventory

The analysis I suggest focuses on the three co-constituted aspects of text and situation—textual substance and form, production practices, and use practices—and assesses these aspects along three time-based categories, all centered on pilots with (genre stabilizations of) the new textual practice. The first category of analysis considers what the organization *intended* to occur in the pilot: What substance and form did they want to see in the texts produced during the pilot? What practices did they intend to be used in the production of the stories? What practices did they intend to be used by those who watched and used the finished texts?

The second category of analysis concerns what *actually happened* during the pilot. This question would again be explored from the three co-constituted aspects of text and situation: textual substance and form, production practices, and use practices. The final category of analysis concerns what the organization *desires*. Based on what happened in the pilot, how would they prefer the textual substance and form, production practices, and use practices stabilize? Practically, the researcher or implementing team would begin their inventory by documenting intended outcomes prior to the start of the pilot; they would track the actual happenings during the pilot; and they would use both of these categories of data to contemplate the desired stabilization after the pilot is complete.

Figure 2 organizes these categories of analysis into a very simple reflective tool, the genre inventory, which can be used by either researchers or implementation teams to analyze a pilot. A separate inventory would be done of each pilot. This is the key reflective tool to use in a genre-informed implementation analysis; it not only helps implementers to reflect on a recently offered pilot, but it also serves as a coherent way to document pilots, so that if an implementation effort is suspended, the work done thus far is retained in a systematic form.

Pilot Use/Genre Stabilization #1	**Intended (centripetal)**	**Actual (centrifugal)**	**Desired**
1. Textual substance and form			
2. Production practices			
3. Use practices			

Figure 2. The genre inventory tool.

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Download tool as rich-text format doc: 14_Dush_genre_inventory_RTF.rtf

The three categories of analysis in Figure 2—what implementers intended to happen, what happened, and what the implementers would like to happen in the future—are intuitively sensible ways to look at a pilot. But they are also particularly important from the lens of genre theory, for they integrate a way to consider both the plans of implementation leaders—most often people with a fair amount of power in the organization—and the modifications made by actual users of the new textual practice. I draw here on Mikhail Bakhtin (1981) and his concepts of *centripetal* and *centrifugal* forces that are in constant play during language use. The centripetal force is the official, centralized plan—the way those in charge imagine a new textual practice should look and operate. It is denoted on the genre inventory by the "Intended" category. Centrifugal forces come into play when language users, in the hunt to satisfy their particular needs, diverge from the centripetal vision of things. For example, in the Business Communication pilot of digital storytelling at Tech Year, Madeline discouraged the students from making what she called “tribute stories,” which were stories that paid homage to a friend or family member but often lacked the sort of story arc that Madeline felt was an essential learning outcome of the digital storytelling unit. A number of students, however, driven by needs more pressing than a good grade in the course—such as a desire to honor a loved one or a need to express their admiration for a friend or relative that had passed away—ignored Madeline’s vision of digital storytelling and produced a tribute anyway.

At other times, centrifugal forces will manifest in what activity theorists call “contradictions” (Engeström, 1990), where behavior learned in a parallel or historical genre causes problems as a person tries to complete an action. One example of this came as both the students and teachers at Tech Year struggled to adjust the way they discussed the stories and essays about empowerment that were intended to be fodder for the students’ digital storytelling scripts in the Empowerment unit pilot in the Business Communication course. Both the students and their teachers were accustomed to approaching these texts from the more familiar framework of critique and analysis, so their preparatory discussions and writing were not conducive to the new activity of crafting a digital storytelling script with a pleasing narrative arc.

Systematically incorporating centrifugal forces into an implementation analysis is important; as Clay Spinuzzi (2003) argued, official planners and designers can learn a lot from unofficial innovations made by the users of a genre. At Tech Year, for example, the students who made tribute stories against Madeline’s wishes were ultimately some of those who were most invested in their projects. Many of them brought their families to the Tech Year premiere and distributed their stories online, both promoting Tech Year and activating parent involvement. That is, their centrifugal impulses and actions produced valuable results, and when reflecting on the pilot, Tech Year would be wise to acknowledge and consider incorporating their innovation. A second reason to consider centrifugal divergences is that they may point to behaviors learned or valued elsewhere—either within or outside of the organization—that will cause persistent problems in the production and use of the new textual form.

Data Collection with Attention to Cognitive/discursive, Material, and Social Practices

Before I discuss what sense the genre inventory tool can make of Tech Year’s pilot efforts, I’d like to briefly address how a researcher or implementation team can collect the data necessary to complete a genre inventory. A perspective on genres that sees them as reflecting and constituting social reality implies taking care to capture all dimensions of that social reality. It is important to characterize production practices and use practices with consideration to three dimensions: cognitive/discourse practices, social practices, and material practices. When completing the inventory of intentions for a pilot, for example, this means asking questions like: How do we imagine people will think and use language—that is, what cognitive and discourse skills will be emphasized—during the production and use of these new texts? Who will be involved? What social relations and roles will different people and groups take during the production and use of these new texts? What tools and other texts will be used during production and use of these new texts, and how will these practices be practically accomplished in space and time?

Here is where the long tradition of genre research, and of composition research in general, is of great help. It provides us with a sense of a range of methods that can be used to scour these three dimensions of practice related to genre. We might, for example, study cognitive behavior by videotaping writers as they compose and viewers as they watch the new texts, later interviewing them about our observations (Schryer et al., 2003). To identify relevant social and material practices, we can look to ethnographic methods of workplace researchers who have used genre theory (Dias, Freedman, Medway, & Paré, 1999) or the work of researchers who have examined social and material concerns by combining genre theory with cultural–historical activity theory (Russell, 1997; Russell & Yañez, 2003; Spinuzzi, 2003).

Filling out the first column of the genre inventory—of intended textual substance and form, production practices, and use practices—is, for a researcher, a matter of conducting interviews, sitting in on meetings, and scouring planning documents to assess what implementers want from a particular pilot. For implementers conducting a genre-informed implementation analysis without a researcher's assistance, a key implementer can draft the list and submit it for a check by others at the organization.

Gathering data during the pilot, to fill in the "Actual" column of the genre inventory is more of a challenge. Although much of the data related to the substance and form of texts made during a pilot can be gathered by examining the finished texts and interviewing authors about these texts, information related to production and use practices during a pilot requires being on site for most, if not all, of the pilot activity, and being able to separate out what is relevant to implementation from what is not. These site visits are best structured by a data collection instrument that keeps the researcher or implementation team oriented toward the particular concerns of a genre-informed implementation analysis. Figure 3 offers one such instrument.

Date	**Primary activity is related to (circle one) production or use**
Textual Substance and Form	
Substance of texts (themes and topics)? *Form of texts (structural features, media incorporated, language)?*	
Cognitive and Discourse Practices	
Mental and language practices and skills used?	
Social Practices	
Who is involved? *Social roles?*	
Material Practices	
Where is activity happening? What tools are being used? *What documents and genres are used and/or referred to?*	
Note: use a * to indicate possible contradictions or possibilities (centrifugal forces)	

Figure 3. Data collection instrument for documenting pilot activity.

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Download tool as rich-text format doc: 14_Dush_instrument_RTF.rtf

The instrument displayed in Figure 3 asks the researcher to first note whether the observation is centered on the production of the new text (for example, a class session where students are producing their stories) or the use of it (such as a showing event). In most cases, this selection is easy to make. Data collection is then guided by four main categories. First, *textual substance and form* is a place to note observations about the themes, topics, structure, media, and language that characterize texts at this point in time. Second, the *cognitive/discourse practices* category is where the researcher can note mental processes and skills used in the production or use of texts at this time. Third, in the *social practices* category, the researcher notes who is involved in the activity being observed and what social roles particular individuals and groups take. Finally, the category of *material practices* is a place to indicate how space, tools (including other texts), and time are used. The instrument also reminds the researcher to be on the lookout for problems and possibilities by noting possible centrifugal forces at work.

In terms of practically implementing a genre-informed implementation analysis, having a rigorous data-collection instrument is important. When all of the various aspects of genre are accounted for during data collection, generating relevant inventories is much more straightforward.

A GENRE INVENTORY OF A TECH YEAR PILOT

The appendix shows a completed genre inventory of Tech Year's final digital storytelling pilot, the Empowerment unit in the Business Communication course, which ran from December 2006 to January 2007. The students spent the first 3 weeks of this unit reading and writing on the theme of personal empowerment, with an end goal of generating a digital story script from a portfolio of writing created during these weeks. The next 4 weeks were devoted to digital story production. On the genre inventory, I have aligned intended outcomes with actual outcomes of roughly the same sort, to highlight convergences and divergences. While I leave it to readers to examine the specifics of the sample inventory, it is important to understand the general moves required to interpret and act on such an inventory. Once the pilot is complete and a list of intended texts and practices is compared to actual texts and practices, it is important to ask three questions:

1) What went according to plan and what diverged from the plan?
2) What are the sources of the divergences between our intended plan and the actual pilot?
3) In light of this pilot, what do we want, in terms of textual substance and form, production practices, and use practices, if we proceed with implementing digital storytelling as a tactic to answer to this recurrent, socially important situation or activity? In other words, how do we fill in the "Desired" column?

The concept of North American genre theory as presented in Figure 1 gives us guidance on where to look for answers to the three questions above. During this pilot, a fair number of key intentions were realized. Almost all of the students completed their stories in the time allotted and on an empowerment theme. The writing teachers handled the majority of the teaching. The stories were showcased in a premiere event. But there were also many divergences between intentions and actual happenings.

Divergences suggest both problems and possibilities. When investigating divergences between planned deployments and actual results, there are a few places to look for problems. First, if there are endemic discrepancies between intentions and reality—if very few things go as planned in the pilot—then it is wise to look for some sort of systemic imbalance between the new practice and existing organizational norms. Perhaps the new textual practice is an unsuitable match for the recurrent, socially important situation or activity that it has been used to mediate in the pilot. Usually, when the key users of the new practice are involved in the implementation, they have enough knowledge to avoid this problem, but it can be a problem with top-down implementations. Second, discrepancies between intentions and reality can occur when other organizational genre ecologies do not match very well with the ecology connected to the new textual practice. Identifying any of these potential contradictions is important, even though they may lead implementers to the realization that the new practice is too much of a stretch to fit in the organization (at least at the time of the pilot). There were early indications of such incompatibility at Tech Year by a few members of the technical teaching staff who felt that the technologies used to make digital stories were not the same sort of technologies Tech Year students needed to learn for their apprenticeships (and thus that the teaching writing ecology was out of step with the technical training ecology). Such problems are major and may lead implementers to significantly adjust or even abandon their implementation plans.

A more manageable set of problems comes when some of the practices that accompany other genres in the ecology are contradictory to those required by the new textual practice. For example, Tech Year used a method common in writing courses to help students generate their digital story scripts: the students wrote short responses to readings, movies, and multimedia art on the theme of personal empowerment and then compiled these short texts into a portfolio. The intention was that each student would select their favorite document from this portfolio and this would be, with minor changes, their digital story script. But the textual and cognitive practices required to complete the responses in the portfolio were not particularly helpful to the act of writing a story script with a narrative arc. If producing a good script was the goal, having the students revise a single action-driven story, shaping and refining its narrative arc over time, would have been a better technique.

A final source of problems is when the personal exigencies and activities that individuals are involved with outside of the organization influence their behavior. Those students who wrote a story script with a MySpace audience in mind—stories that were inappropriately personal or too casual for a school assignment—are an example of how the pull of other exigencies and activities can cause problems.

Although the previous divergences have been presented as a source of problems, they are also a source of possibilities. As a simple example, when the story production process began, Madeline told the students that they could not use copyrighted music. To drive this point home, she spent some time teaching them how to find royalty-free music online. But several students, again driven by needs more urgent than heeding Madeline's decree, used popular songs in their digital story. One student, David, made a story about a best friend who died of cancer. For him, it was essential to have a song beloved by this friend as the soundtrack. David decided to write an email to the record company, and, surprisingly, was granted permission to use it in his digital story. In another case, a student named George used two popular songs in his digital story. George's story ended up winning the staff and student-voted "Best Picture," and his spot-on musical choices had a lot to do with the overall effect of the story. Tech Year, in evaluating the Empowerment pilot, might look at whether the success some students had with using copyrighted music might warrant loosening the restriction in subsequent offerings.

In cases where there are discrepancies between intentions and actual occurrences, but the pilot is not overrun by discrepancies, organizational members can work together to generate a list of questions related to these discrepancies. These questions should cover both problems and possibilities, ranging from questions about how certain practices that worked well were deployed, so that they might be successfully repeated, to questions about modifying particular expectations based on unexpected problems or successes, to questions about making material adjustments so that problems might be avoided. Different questions will emerge from each pilot, but at root these questions will all circle back to the same concern: What practical changes must we make to sustain this new practice?

GENRE-INFORMED IMPLEMENTATION ANALYSIS: IMPLICATIONS FOR IMPLEMENTERS

A genre-informed perspective on implementation suggests that successful implementations are targeted implementations. When an organization is introduced to a new textual practice that appears to have many utilities, they should recognize that focusing their implementations around one or two primary organizational uses will likely speed organizational adoption and enhance sustainability of the new practice.

To this end, an implementation effort should begin with a *pre-inventory* of the new textual practice. A pre-inventory requires that in-depth, genre-informed brainstorming be done on the front end of an implementation project to see if and how the new practice might operate in various potential genre ecologies. This brainstorming, aided with questions like those in Figure 4, can help implementers predict which of many possible organizational uses for the new practice is or are most feasible, and also may help them anticipate problems that may arise due to poor fit with existing contexts.

1) What recurrent, socially important situations and activities are we most interested in using this new textual practice for?
2) If we implement this new practice in the particular situations and activities listed above, will it allow the organization and individuals within it to accomplish action that current practices do not? If so, what actions?
3) How do we want the texts produced to look, in terms of substance and form?
4) What cognitive and discourse practices will be utilized to produce the texts? Are these practices familiar? Manageable? Desirable?
5) Who will be involved in the production of the texts? What social roles will they occupy? Will this new practice ask people to relate to each other in unfamiliar ways? Do we care to deal with these new relationships?
6) How will the practice require we use organizational time and space? Are these arrangements familiar? Manageable? Desirable?
7) What cognitive and discourse practices will be utilized in using the texts? Are these cognitive and discourse practices familiar? Manageable? Desirable?
8) Who will be involved in the use of the texts? What social roles will they occupy? Will this new practice ask people to relate to each other in unfamiliar ways? If so, do we care to (or need to) deal with these new relationships?
9) How will the use of the texts require we use organizational time and space? Are these arrangements familiar? Manageable? Desirable?
10) Do we have the energy, resources, and drive to deal with all of the changes that have emerged in this inventory? Should we hire or reallocate people to help us meet these challenges?

Figure 4. Pre-inventory questions to ask prior to a pilot effort with a new textual practice.

Download tool as Word doc: 14_Dush_inventory_Word.doc

Download tool as rich-text format doc: 14_Dush_inventory_RTF.rtf

Organizational members should brainstorm widely to answer question one in the pre-inventory, explore the answer to question two for each of the possible new utilities, and then do more detailed inventories using questions 3–10 for those utilities they see as most promising. Doing a pre-inventory of a textual innovation may even lead an organization to decide to cancel their implementation plans, if the new textual practice does not seem like it will offer enough rewards for the difficulties it will likely cause.

The greatest advantage of a genre-informed implementation analysis is that it encourages sustained engagement with an innovation, engagement with the sort of depth that helps implementers learn about the needs of both the organization and the people within it. Time spent on implementation—even if it ultimately results in a decision not to adopt the new textual practice—thus becomes time well spent, rather than time wasted. The process also both depends on and facilitates communication between different people within an organization. By giving organizational members the chance not only to express their desires about an innovation, but to also reflect on why those desires were or were not put into practice and to then modify these desires, the tool provides many opportunities for people within the organization to be involved in meaningful planning.

A new textual practice has the potential to alter organizational norms in impressive and expansive ways. As Brenton Faber (2002) noted, “when people transgress genres, violate boundaries, and break with routine practices, change becomes possible” (p. 172). In other words, new textual practices, although they face considerable obstacles to long-term sustainability, also bring with them the possibility of altering the range of individual action and large-scale activities in an organization. It is the possibility for change that Faber described that motivates implementers like Madeline Davis and her colleagues at Tech Year. With a reflective and analytical tool such as the genre inventory, these potential changes have a much better chance of becoming a sustainable reality.

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Appendix. Genre inventory for the Empowerment pilot at Tech Year.

Empowerment pilot	**Intended (centripetal)**	**Actual (centrifugal)**	**Desired**
1. Textual substance and form	Empowerment-themed digital story with a shapely narrative arc	Most stories related to empowerment Many ‘tribute’ stories Some stories with no narrative arc	
	Capstone quality	Highly polished to very rough	
	Photos primarily from personal collection	Digital stories with all stock photos Digital story with personal illustrations	
	Copyright-free music	Several stories with copyrighted music (one student wrote for and was granted use rights)	
2. Production practices	Stories developed in 3-week reading/writing unit	Many texts produced, but few with a narrative arc	
	Script selected via portfolio assessment process	Very few students find story script in their portfolio	
	3 weeks in lab, with production process proportioned the same way Madeline’s 4-day digital storytelling training was	Story circle takes six days instead of one	
	Two classes, with total of 38 students		
	Work done in 80-minute classes, 4x/wk	Almost all production done outside of class	

	Extra time provided during last two weeks Keyanna, apprentice teacher, is primary teacher, Madeline backup Writing teacher handles both technical and writing teaching Student technical committee assists with audio recording/CD burning	Madeline takes over primary teaching role, particularly in production process Steve, technical teacher, teaches audio and video editing	
3. Use practices	Students' stories burned to CDs for archival and sharing purposes Premiere event to happen several weeks after completion of unit: "Celebration of Empowerment" Stories shown at Premiere to be selected by a staff/student vote	Not all stories made it onto CDs (student Tech committee not sufficient when problems arose) Students share stories by posting them on YouTube/MySpace where many receive lots of viewer comments Premiere pushed back 2 months—needed to use an elective course during apprenticeship to plan it; able, this way, to spend more time reaching out and inviting attendees Not all students' stories were voted upon	

		Students showed stories to family/friends, opening up discussions about personal issues Students showed stories to mentors and apprenticeship staff Steve creates archival system and files stories according to what level of sharing permission students have consented to	

Introduction to Section IV
"Sustaining Scholarship and the Environment"

INTRODUCTION

There are two ways we want to frame this final section of *Technological Ecologies and Sustainability*. The first way relates to sustaining scholarship—that is, fostering, supporting, and moving forward conversations, research agendas, scholarly trajectories, and more. Doing so productively requires navigating a complex set of considerations.

Perhaps more than any other digital humanities scholar, Dickie Selfe has provided us with ample and nimble recommendations for establishing and sustaining cultures of support.

In chapter 2 of his 2005 *Sustainable Computer Environments: Cultures of Support in English Studies and Language Arts*, Dickie offers a robust set of steps that technoleaders can take in doing so:

Step 1, he suggests, is to recognize the support required to integrate technology in meaningful ways in English Studies and language arts. He identifies some of the barriers to such meaningful integration, including lack of time; lack of technical support; lack of systematic, relevant training; lack of convenient access to technology; and the prohibition of folks from participating in meaningful ways in shaping technology decision-making.

Step 2 is to involve English and language arts teachers in creating a culture of support. Activities that foster involvement include constructing and sharing technology-rich teaching activities, units, and assignments; meeting together and collaboratively crafting goals for technology integration; and engaging in authentic, regular acts of technology initiative assessment.

Dickie's third suggested step is to identify primary stakeholders. His list of key stakeholders in technology initiatives includes teacher-leaders; teacher-users; technical staff; students and student workers; and administrators.

SUSTAINING SCHOLARSHIP

Linked to developing and sustaining technology-rich initiatives is supporting and sustaining research trajectories within technological ecologies. In rhetoric and composition, we have more than 20 years' worth of guidance, leadership, and scholarship to draw from in computers and writing.

There are conversations to continue, and conversations to expand. And there are certainly plenty of questions to remain unanswered. Sustaining research in the digital humanities requires that we draw upon past work and resituate ourselves in the face of evolving and new technologies, and the impact they have on literacy and on writing.

SUSTAINING THE ENVIRONMENT

And, finally, the largest and perhaps most pressing issue related to sustaining our work relates to sustaining the actual, physical environment in which we work.

Rhetoric and composition has a long history of work in environmental rhetorics, including books like *Technical Communication, Deliberative Rhetoric, and Environmental Discourse*, edited by Nancy Coppola and Bill Karis; and *Environmental Rhetoric in Contemporary America*, by Carl Herndl and Stuart Brown; and by the work of scholars like Craig Waddell, Marilyn Cooper, and Sid Dobrin.

And, certainly, many of us are active in environmental efforts in our lives outside the academy, serving on environmental impact review boards, leading recycling initiatives at our institutions, and consulting with our campus sustainability offices, for instance.

As a field, however, we have not established a large-scale environmental sustainability initiative. Nor have we looked critically at our own technoecological footprints.

Identifying our ecological footprints within our specific technological ecologies is key to understanding the ways in which technologies leave trails, and where tools go to die, or, ideally, to be reborn.

SECTION OVERVIEW

In this section, “Sustaining Scholarship and the Environment,” Lisa Lebduska first situates our work within the commons, which, as a shared space of resources, has measurable limits. Lisa distinguishes between development and growth, and layers in Lessig’s notion of innovation commons. Doing so allows her to chart the limit-related tensions that require our attention as we sustain technological ecologies.

In “Old World Successes and New World Challenges: Reducing the Computer Waste Stream in America,” Shawn Apostel and Kristi Apostel trace for us the paths of technologies into our lives, through our institutions, and, often, across the globe. Shawn and Kristi offer models from within the United States and in the European Union, and point toward best practices in environmental stewardship.

And, finally, Cindy Selfe and Gail Hawisher, in “Balancing Tradition and Change: Sustaining Scholarly Efforts” reflect upon their experiences as leaders in the field, and provide direction for us, warning us that we are the shepherds of digital humanities work, and sustaining this work is crucial for maintaining our relevance in our institutions and in the world. Cindy and Gail describe “a productive middle ground between the historically informed values of the humanities and the changes currently informing emerging information ecologies in digital environments.”

This final section thus illustrates our need to look beyond our current institutional and ecological contexts—to envision ways to foster and sustain our work and our environment.

CHAPTER	15
TITLE	Sustainable Digital Ecologies and Considered Limits
AUTHOR	Lisa Lebduska
OVERVIEW	This chapter explores the challenges of sustaining digital ecologies within the context of a postmodern era that has been characterized by *limitlessness*. Rejecting a simple model of growth that looks only to increase resources (more computers, more hardware, more personnel), I propose a development model that engages the real material, social, and psychological limits of a digital commons. This model of a digital commons intersects Garret Hardin's ecological rivalrous commons with Lawrence Lessig's construct of the innovations commons. Hardin's work posits that shared physical spaces (like pastures) have material limits and that individuals will act in self-interest to maximize their use of such space, depleting resources until they disappear. Hardin advocates the imposition of limits (i.e., use laws) to protect the commons against destructive self-interest. Lessig contrasts this model with the "innovation commons" of the Internet, which depends on use. Open-source code, for example, encourages the exchange of innovation. The more that users can access and improve code, the more the innovation commons will improve. But intellectual property laws limit such exchange, consequently depleting the availability and development of ideas. A digital commons thus requires rivalrous as well as innovative commons for sustainability. The sustaining of such a complex commons must therefore engage with the panorama of limits, which are neither good nor bad, but, instead, warrant careful attention by those seeking to develop thoughtful, creative, and nimble pedagogical uses of cyberspace.
TAGS	compatability, complexity, cyberspace, development, digital ecological commons, digital ecologist, ecology, Everett Rogers, Garrett Hardin, growth, heuristic, human, ideational limits, innovation commons, innovations commons, Lawrence Lessig, limit of the commons, limit*, Lisa Lebduska, non-rivalrous commons, observability, pastoral commons, relative advantage, resource*, rivalrous commons, socio-cultural limits, sustain*, taxonomy, technolog*, theory of innovation, Tragedy of the Commons, trialability
AUTHOR BIOGRAPHY	Lisa Lebduska is an associate professor of English at Wheaton College, where she directs the college writing program and teaches a variety of writing courses. Her work has appeared in *Environmental Politics*, *ISLE*, *Writing on the Edge*, the *Writing Lab Newsletter*, and *Composition Studies*. "The Body Matters of Digitized Contexts"—Lebduska's chapter examining the material challenges posed by online environments—will be included in Hampton Press's forthcoming *Teaching Writing in the Twenty-First Century*, edited by Joanna Castner and James Inman.
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Sustainable Digital Ecologies and Considered Limits

Lisa Lebduska

> The one constant theme in off-the-cuff discussions with [Computers and Writing] participants over the three days was the continuing resistance to the use of computers in instruction experienced on a wide range of campuses. People, at least at this conference, had a hard time understanding why rather simple processes using computers and the internet and databases (blogs and e-portfolios, for instance) repeatedly encounter sometimes virulent resistance among colleagues and even IT staff (though less and less from administrators). (Kemp, 2005)
>
> There is no box. (Amory Lovins in response to a reporter's use of "thinking outside the box"; Kolbert, 2007)
>
> After the final no there comes a yes
> And on that yes the future world depends.
> (Stevens, 1954)

Although "literacy" has been a contested term throughout institutional history dating back to Plato, within the last 20 years the proliferation of computers and digitized media has given it particular fragmentary force, with calls for new genres (e.g., Greg Ulmer's "electracy"; Cynthia Selfe's "layered literacy"; Kathleen Yancey's "textured literacy") and new pedagogies (e.g., the New London Group's "multiliteracies") that recognize the power and pervasiveness of digitized and audiovisual media. But, as Anne Wysocki and Johndan Johnson-Eiola (1999) noted, "literacy" has itself become a ubiquitous metaphor, invoked often as a means of neutralizing politically complex practices, implying that the making of meaning can somehow exist apart from socio-cultural considerations. This ideological erasure, they contended, intensifies when "literacy" is paired with a second term such as "computer" or "technological," again suggesting that individuals need only acquire a value-free set of skills to achieve success.

Richard Selfe's (2005) "digital ecologies"—the intersection between a socially contextualized set of complex practices involving reading, writing, and composing within various electronic environments and "the pragmatic strains that result as teachers, staff and administrators attempt to adjust to changing literacy patterns in classrooms, labs, online learning, and teaching environments" (p. 1)—has, in part, responded to Wysocki and Johnson-Eiola's critique. Sustaining these digital ecologies, as Selfe explained, depends on shifting from a *culture of blame* (e.g., claiming that others are responsible for failures in technological education) to a *culture of support* involving staff, faculty, students, and administrators as invested and important stakeholders. Although these digital ecologies contain literal computer networks, and, although "network," as Jeff Rice (2006) argued, resonates with metaphoric and literal significance for the types of literacies English Studies should pursue, I suggest that the sustaining of digital ecologies parallels the efforts needed to sustain biological ecosystems and that the "limit of the commons" offers a productive heuristic[1] for digital ecologists.[2]

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[1] Any discussion of digital ecologies engages an intricate triple bind. Sustaining digital ecologies entails promoting their development, and such promotion often requires reducing resistance to these ecologies. But resistance is a form of agency deployed in response to domination, so reducing resistance risks treading the line of social coercion. Thus, we must

EARTH ECOSYSTEMS AND DIGITAL NETWORKS: PARALLELS IN SUSTAINABILITY

With its need for contexts, interdependencies, and recognition of the global as well as the local, digital literacy movements have much in common with various ecological movements. Derek Owens (2001), for example, urged compositionists to remember that environmental sustainability requires us to think about the future. Anyone who has ever tried to sustain an electronic environment—whether teaching a class in a MOO, educating a colleague about wikis, or making a decision about whether to designate funds for a wireless lab—would find Owens' assertion familiar. To think with, through, and about technology is to think about what it will do and what it may become. Ecology, as Bonnie Nardi and Vicki O'Day (1999) observed, connotes the diversity and evolution needed to maintain responsible, equitable, and humane relationships with technology; for Nardi and O'Day, "this is a responsibility, not just an opportunity. . . . As users of tools we are responsible for integrating them into settings of use in such a way that they make sense for us" (p. 55). The shared nature of these tools—of servers and software, of computer classrooms and pedagogical understandings—comprise a type of commons, a shared resource that has some of the same characteristics as a public park.

This chapter offers digital ecologists the "limit of the commons" as a productive heuristic advanced through four key moves:

1. describing the ecological distinction between "development" and "growth";
2. demonstrating how the concept of development is linked to the concepts of "limits" and the "limits of the commons" as they have been used in environmental discourse;
3. exploring Lawrence Lessig's (2001) concept of an "innovation commons," which complicates the environmental concept of "commons" by examining it through the lens of cyberspace; and

---

problematize exactly what we mean when we engage in discussions about overcoming resistance to the adoption of technological practices. How many technology support offices, I wonder, have a "resistance is futile" sign hanging above their doorways or taped to the side of a desk? To what extent, even in our most intense moments of building a technological commons, do we risk creating "docile bodies?"

As Michel Foucault (1984) has put it: "disciplinary coercion establishes in the body the constricting link between an increased aptitude and an increased domination" (p. 182). Widespread technological facility, in other words, may put users at risk of subjugation. But the limits of increased domination, I would argue, reside in the digital ecology movement itself. Digital ecologies expand individual choice, providing access to knowledge through cyber achievements such as distance education, digitized archives, and synchronous conversations with others from all over the world. Resistance, when constructed as a limit to be explored, understood, and engaged, provides potential moments of synergy and connection-building. For the cyber ecologist, resistance fosters continuous rethinking, renegotiating, and rejustifying of resources, philosophies, and pedagogies.

[2] A "digital ecologist" is a member of the faculty, staff, and/or administration who works to implement and sustain digital ecologies such as computer labs, up-to-date word-processing software, and other now-basic technological means in educational institutions. "Sustain," in this regard, covers a full spectrum of pedagogical activities, from designing and delivering curricula for credit, to educating communities about software and hardware, to maintaining and staffing computer facilities, servers, and networks.

4. examining how identifying the complicated notion of development and limit within the cyberspace commons can be used to sustain digital ecologies.

Sustenance Entails Development, Not Growth

For ecologists, all natural resources are more or less shared, because what happens to one resource anywhere on the globe inevitably impacts life everywhere. Consider, for example, that carbon emissions produced in one part of the world contribute to the greenhouse effect, which in turn creates conditions ranging from drought to floods all over the planet. The growth that economists measure in numbers of cars produced or new homes built within one geographic region also depletes oil reserves and forests in another area. In ecological terms, “bigger” and “more” do not necessarily translate smoothly into “better”; the view of increase is much more complex. As a result of the multifaceted nature of environmental change, sustainable development for ecologists differs considerably from unlimited growth. Owens (2001), who has developed a platform for ecological composition practice, quoted Herman Daly (1993) to present a useful distinction between growth and development:

> To grow means ”to increase naturally in size by the addition of material through assimilation or accretion.” To develop means ”to expand or realize the potentialities of; to bring gradually to a fuller, greater, or better state.” When something grows, it gets bigger. When something develops it gets different. The earth ecosystem develops (evolves), but it does not grow. Its subsystem, the economy, must eventually stop growing, but it can continue to develop. The term ”sustainable development” therefore makes sense for the economy, but only if it is understood as ”development without growth.” (p. 30)

The distinction between development and growth is equally useful for sustaining digital ecologies, which may, at certain institutions, receive pressure to grow merely for the sake of growth. Funding, no matter what its strings, is better than no funding at all, and the need for speedy grant writing may result in uninformed requests for more computers or newer software or bigger labs—without long-term, sustainable planning. Extending this distinction between growth and development to technology budgets means planning beyond the sake of growth for growth’s sake—that is, thinking beyond simply increasing the number of computers available to students, faculty, and staff, and considering how the technology will be (or could be) used and how useful it might or might not be in the future. More computers without the staff to maintain them, or newer software without the training to use it, do nothing to sustain a digital ecology, and could, in fact, harm it. Computers merely added to an institution without pedagogical planning could end up serving only as glorified typewriters and might, as Christine Hult (1988) demonstrated, actually reinforce weaker writing practices. Hult’s initial research revealed that without proper guidance, students would use word-processing software to correct individual words rather than using the technology to consider the overall communicative impact of their writing. Merely adding computers or increasing the number of students who use computers, in other words, contributes to growth, but does not address the development crucial to fostering digital ecologies.

Sustaining a digital ecology entails emphasizing development rather than growth. Further, true development is a gradual process that entails a rethinking of pedagogical objectives and processes that includes faculty, staff, and students. This development coincides with what William Massey and Andrea Wilger (1998) identified as the last level in faculty instructional technology adoption, an achievement that moves beyond an efficiency level, in which technology is used to enhance “personal productivity” (email, for example, to quicken communication) and “enrichment add-ins,” in which faculty use technologies such as Web pages to enhance their existing teaching but do not significantly alter their teaching. This kind of faculty development constitutes a paradigm shift, in which faculty rethink their teaching, combining the best of their former practices with the best technological advances in order to maximize student learning. These levels of faculty development necessarily overlap and leak into one another, and, at any given moment, different faculty engage technology at different levels. Sustaining digital ecologies will therefore include taking into account these differences as we work toward a paradigm shift that prioritizes development over growth. Prioritizing development in the long run means a return to and renewed focus on the complex practices impacting literacy as we parse limit and its many codes.

Development Requires Limiting Growth

Ecologists argue that limits must be placed on economic growth so that natural resources may be preserved and/or shared more equitably across nations and even generations. A recognition of limits is therefore key to understanding how a shared resource can be developed or sustained. At the surface, considerations of limit seem to be more about containing, holding back, and controlling; limit conjures images of scarcity and finitude rather than possibility. But if we consider how limit has been used successfully to protect environmental resources through the creation of wildlife preserves and national parks (both of which are ecological commons), we recognize that certain kinds of limited growth (i.e., contained development) may actually help to sustain the material components of digital ecologies. Conversely, unmasking the limits to our work—which include such constructions as those of race, gender, sexuality, and social class that associate affluent, heterosexual white males as keepers of the technological flame (see, for example, Cynthia Selfe, 1999) and exclude others—becomes a productive act when the unmasking performance is shared with those who have power to support technological literacy.

Given that limits are human artifacts, constructing and constructed by political and social contexts, they carry with them the same complexities and contradictions of any cultural element. For digital ecologists, these complexities and contradictions stem from the multifaceted nature of their work: Institutional digital ecologies consist of the virtual, the material, and even the psychological. As Lessig (2001) contended, “cyberspace is between [the world of ideas and the world of things]. It offers not quite the freedom of the world of ideas, though it offers much more of that freedom than the world of things” (p. 104). Similarly, digital ecologists must work with the world of ideas and the world of things; they must also work in the world of people. When the concerns of digital ecologists involve the physical components of their commons—such as software, rooms, computers, and even access to online teacher feedback— “limits” may be used productively to ensure the most democratic use and access possible. In this regard, the digital ecologist serves as a kind of steward. When the concerns of the digital ecologist turn to the ideational (who uses computers and why), the limits to thinking and access are productive to the extent that they are identified, unmasked, and then used in their own unmaking. For digital ecologists, limit is a multifaceted concept to be embraced judiciously, dismantled entirely, and engaged thoughtfully, depending on the context.

In the next section, I map one of the key ecological arguments in support of limits: Garrett Hardin’s (1968) “Tragedy of the Commons,” and then explore Lessig’s (2001) application of the commons construct to cyberspace, where limits, in the ecological sense, actually diminish the cyberspace commons. Finally, I demonstrate how limits within the cyber commons of an institution (rather than in cyberspace in general) can be productive as well as destructive, and that digital ecologists need to recognize that complexity in developing and sustaining the digital commons of their institutions. In the table, I provide some of the key terms that will be used throughout the chapter.

Table 1. An extension of Lessig's (2001) innovation commons to the work of the digital ecologist.

	Example	Impact of Use	Type and Role of Limits
Rivalrous commons	pasture	depletes resource	environmental protection laws; help sustain
Non-rivalrous commons	public domain novel	no impact	unneeded; resource has been placed outside of private property bounds
Innovation	Web	increases resource	privatization of computer code; depletes resource as fewer people have access to innovate and improve resources
Digital ecological commons	knowledge of digital technology	mixed: knowledge is enhanced through use, but material resources (equipment) is diminished	social and psychological limits need to be understood, engaged and then reduced or eliminated to increase access; resource use limits may be necessary to democratize access (example time limits on public computer use)

Limiting the Use of Pastoral Commons

Hardin's (1968) "Tragedy of the Commons" is perhaps one of the most well-known environmental arguments in support of placing limits on natural resources and biological commons. Hardin's central example of a commons is a shared pasture on which farmers graze their animals. Left to their own devices, Hardin argued, all farmers would attempt to graze as many animals as possible, thereby maximizing gain from the shared land. As Hardin asserted, however, a pasture can sustain only a finite number of grazing animals before it is depleted beyond recovery. This finite number constitutes a limit. Ocean fishing and coal mining provide similar examples of commons in which individuals compete and deplete through use. Economic growth—through an ever-increasing number of cattle grazed, fish harvested, or coal mined—is ultimately limited by the capacity of the ecosystem. But rather than grow economic use to the point of irreversible ecological collapse, humans can create social limits (i.e., laws) on the use of resources well before the natural limits are reached. In this way, we can sustain the commons. Because Hardin believed that humans possess an instinctive inclination toward maximizing self-interest, he argued that limits on the use of finite resources were imperative if the tragedy of collapse were to be avoided.

This notion of limit has reverberated throughout environmental discourse. *Limits to Growth* (Meadows, Meadows, Randers, & Behrens, 1792), for example, was commissioned by the Club of Rome, a group of international scientists who used computer modeling to predict Earth's maximum sustainable human population. More recently, discussions surrounding global warming (popularized, somewhat, by Davis Guggenheim's 2006 documentary, *An Inconvenient Truth*, about Al Gore's global warming lectures) have included arguments that support limiting greenhouse gas emissions. In both of these instances, the Earth and its atmosphere constitute a kind of commons at risk of being changed and/or altered to a point at which it is no longer fit for human habitation.[3] For ecologists, this issue of limit has raised complex questions concerning the degree and specifics of limits—for instance, who should determine parameters and at what point limits should be imposed. Murray Bookchin (1989) explained that the ancient Greeks conceptualized limit as “the golden mean which meant ‘nothing in excess’” (p. 178). Arguments posed at several Earth Summits have noted that the current industrialized nations of the world achieved their economic advantage through an unrestricted use of various resources, such as coal and oil, but nations whose economies are emerging are now expected to restrict their use of such resources for reasons of global environmental health.

The contested, complex nature of environmental limits has its parallels in the issues threading digital ecologies. Significantly, the relationship between limits on material resources and the culture of support outlined by Richard Selfe (2005) is as conflicted as the relationship between limit and environmental movements aimed at sustaining the earth. When the issues surrounding limits are considered in terms of the non-material, they become even more complex. To explore the role of limits in the non-material components of digital ecologies, it is helpful to see how they have been constructed for cyberspace.

GRAZING IN THE CYBERSPACE COMMONS: COMPLICATING LIMITS

As discussed, for environmentalists, shared resources typically include commons (e.g., (pasture, forests, natural resources), free and open to use by anyone. But the notion of commons, as Lessig (2001) pointed out, may be extended to include cultural artifacts such as public domain material and documents for which authors have released their absolute copyright and invited others to use and remix those documents. Lessig has refined the commons model by categorizing commons into two distinct groups: *rivalrous* and *non-rivalrous*. Hardin’s pastoral commons, Lessig explained, is a rivalrous resource—a resource for which individuals compete, and a resource diminished with each use. By contrast, a non-rivalrous resource is something not diminished by use—a public domain text, for example. Any number of people may read, discuss, prepare derivatives of, and otherwise borrow from a public domain text without decreasing its availability to others. Because use does not deplete non-rivalrous commons, limits need not be placed on the amount or frequency of their use. Lessig has established the difficulty and even the danger of placing the same limits on rivalrous and non-rivalrous commons: “The system of control that we erect for rivalrous resources (land, cars, computers) *is not necessarily appropriate* for non-rivalrous resources (ideas, music, expression). Indeed, *the same system for both kinds of resources may do real harm*” (p. 95; emphasis Lessig’s).

Lessig (2001) posited that the Internet, ideally, should lie outside the rivalrous/non-rivalrous commons dichotomy because cyberspace constitutes an “innovation commons” (p.23), which is neither rivalrous nor non-rivalrous, and is actually increased through use. By using the Internet, for example, programmers and Web authors often copy readily accessible HTML code and cascading style sheets without charge, and, through this process both learn how to build Web pages and compose Web pages. The lack of limits or controls on this code encourages authors to experiment, expand, and invent freely. Such movement “builds a commons. This commons in turn lowers the cost of innovation. New projects get to draw upon this common code; every project need not reinvent the wheel” (Lessig, p. 57). A similar effect

[3] The arguments surrounding to what extent the Earth will or will not be fit for all human habitation are far too complex for the confines and focus of this chapter, and admittedly will be impacted by the intersections of race, class, and gender as the Earth remains habitable for some people in some places and is uninhabitable by some people in others.

is experienced in the digital ecologies of educational institutions. The Conference on College Composition and Communication (2004) made clear in its "Position Statement on Teaching, Learning and Assessing Writing in Digital Environments" that "as composers use digital technology to create new genres, we can expect the variety of digital compositions to continue proliferating" (online). Innovation breeds innovation. Digital ecologists—whether introducing students to Internet search strategies or helping them to explore the facets of wiki composing—need as much freedom as possible to explore, invent, and create.

Conversely, limits to innovation diminish the innovation commons. Lessig (2001) conjectured that had Apple's AppleScript language (which allows code to be concealed) been the main language of the Web rather than HTML, the "knowledge commons" would have been smaller. Although farmers who graze their sheep on a common pasture will deplete it, Web designers who post pages and sites are building the Web through their use of it. Lessig's analysis of this innovation commons emphasizes the negative effects of controlling ownership: The more Internet technologies become property, the more the innovation commons is diminished; ownership thus tends to consolidate access. Limits in the form of intellectual property laws—unlike the limits of environmental regulation—deplete rather than preserve the innovation commons. Further, converting elements of cyberspace into private property, Lessig contended, excludes some groups. When fewer people have access to the tools to build within a commons, fewer people contribute to it. There is less diversity of opinion and idea, less opportunity for innovation and exchange. In the cyberspace universe, a limit becomes a kind of control that actually diminishes the commons and the digital ecologies sustained by those commons. (See Figure 1 below for a map of rivalrous, non-rivalrous, and innovations commons and their intersections with digital ecological spaces.)

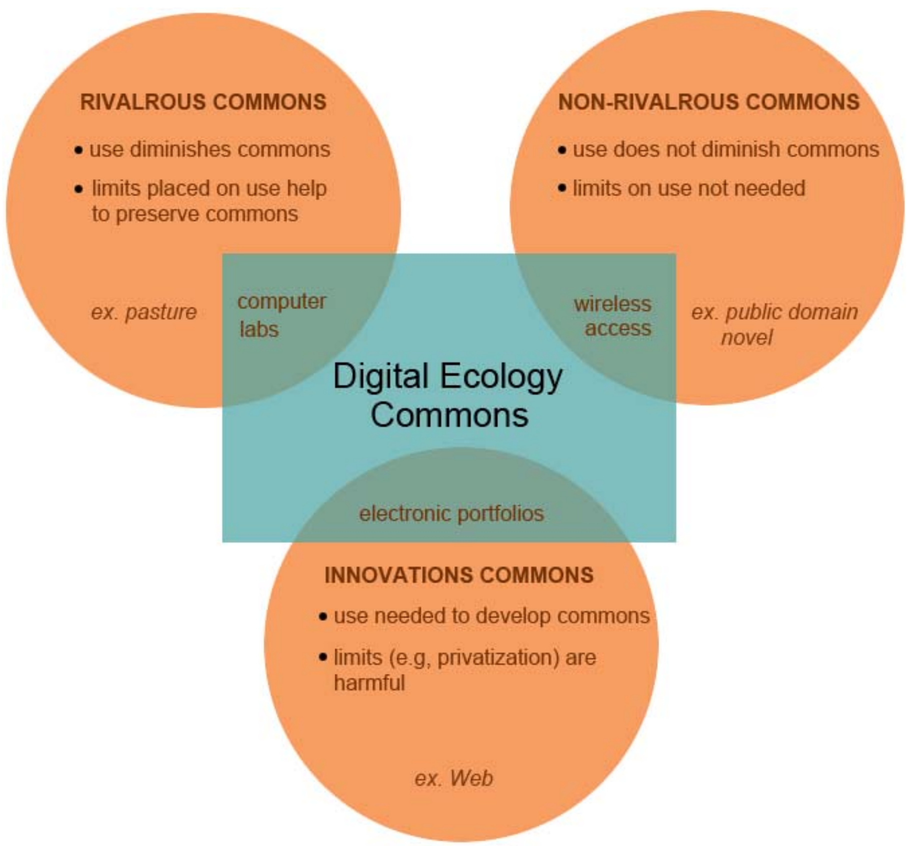

Figure 1. An extension of Lessig's (2001) innovations model to the digital ecology commons

DIGITAL ECOLOGIES IN HIGHER EDUCATION: THE CONTRADICTORY NATURE OF LIMITS

The innovation commons that Lessig (2001) described poses a particularly complex challenge to higher education, where some limits diminish digital ecologies, but other limits help to preserve and expand them. Unlike the internet, other digital ecologies often serve as the nexus of rivalrous and non-rivalrous commons. Most digital ecologists recognize the rivalrous nature of their work, in which unproductive limits include shortages of funding to replace outdated equipment or renovate classrooms or purchase software licensing agreements. At the same time, most embrace the non-rivalrous, seemingly limitless attributes of digital ecologies: the exploration, experimentation, and innovation made possible by their exchange and use. I wish to suggest however, that limits at times may be productively recognized in three ways:

- First, through establishing them when it is necessary to maintain the deepest possible use of resources (as when, for example, an instructor may limit enrollment in an online class to ensure that the students receive as much individualized instruction as possible).
- Second, through identifying social limits that result in fewer women and or students of color engaging with technology; these limits need to be identified and called into question as direct contradictions of an institution's mission, rather than being seen as indicators of "natural" inclination or impediments only to technical facility.[4]
- Third, identifying and engaging with groups who might pose individual limits to the commons because of their reluctance to adopt digital technologies is paramount. Engaging those who actively resist adopting technologies—playing what Peter Elbow referred to as the "doubting game" and what Wayne Booth termed "the rhetoric of assent," will entail actively listening—not with the intent of "winning" the technology argument but with the intent of understanding and, ideally, moving to a position acceptable to both.

This next section examines how constructing some limits (such as access to computer labs) helps to preserve digital ecologies, while identifying, unmasking, and engaging seemingly unproductive limits may be the best way to make use of them.

[4] The field of composition and rhetoric at its core, is a democratic field founded on principles of equality and access. Work undertaken to develop the field, by extension, adheres to the same principles. By contrast, limits placed for the purpose of consolidating power and limiting education to any select and/or privileged group, are at their core anti-democratic. The challenge, of course, lies in identifying hidden limits—if one is surrounded by individuals who have ready access to technology, it is easy to forget the variability in both depth and breadth of access to software, hardware, and the knowledge to use the two effectively.

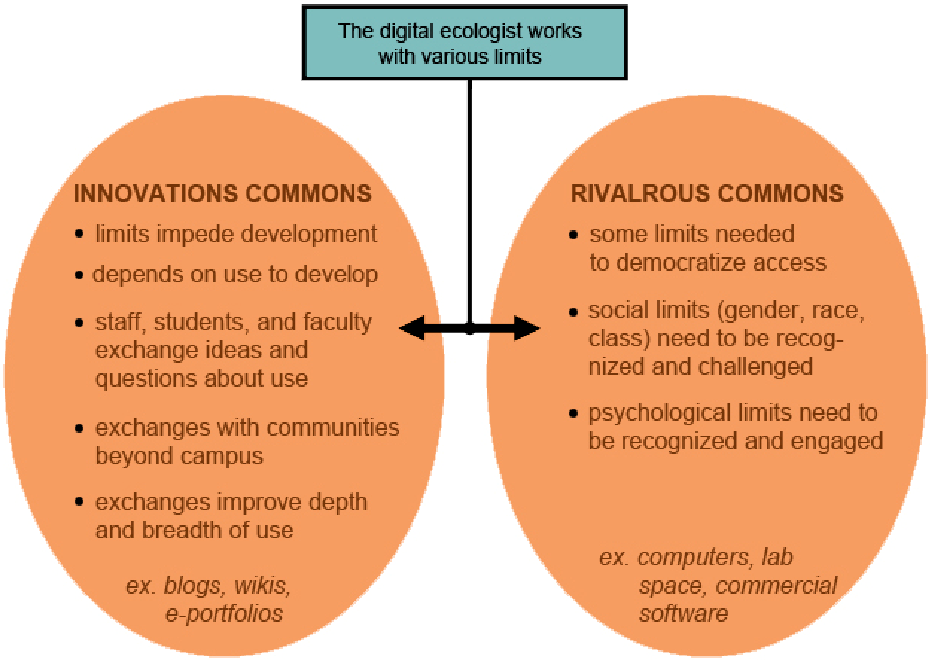

Figure 2. The digital ecologist works in two commons

The Potential Benefits of Material Limits for Rivalrous Resources

The systems of regulation that we devise for rivalrous resources, such as rules controlling access to computer labs or policies related to borrowing laptops, may impede the production of non-rivalrous resources, but also may be necessary to ensure access to the commons. At times, limits are needed to protect the corporeal elements of the cyber commons. Institutions with limited computer resources may find it necessary to limit the amount of time students can spend on a computer or may limit the types of activities students can engage in so that as many students as possible can access those facilities. It may also be necessary to construct limits proscribing the type of commons usage. Computer labs may restrict students from using chatrooms or accessing email on designated research computers. In these instances, the regulation of a computer lab functions very differently than the privatization of software. Although intellectual property—like software—restricts use to only those who can afford it and results in fewer people using it, limits on the amount of time or the ways in which public computers can be used are intended to maximize the number of users gaining access to a resource. For digital ecologists, limits on material resources democratize rather than privatize the digital commons.

Limits designed by digital ecologists to protect and democratize the use of computer resources, like environmental laws used to preserve natural resources, are key to sustainable development. But other limits—such as small or non-existent budgets for hardware, software, staff, and training—restrain the development of the cyber commons. At first, it may appear that such limits are purely material (e.g., in the case of a shortage of funding). If, for example, a college had endless appropriate computer lab space, it would not need to place any limits on use. But underlying these seemingly material limits are decisions, decisions that are the products of psychological forces and social structures. As this next section explains, the innovation commons depends on use to build and sustain it.

The Drawbacks of Limits on Non-Rivalrous Resources

As Lessig (2001) noted, innovations commons depend on the free exchange of diverse ideas in order to grow, and such is the case with the digital ecologies of educational institutions. To build the innovation commons of their home institutions, digital ecologists must continually promote extensive and creative uses of their cyber commons. The more faculty who build digital work into their pedagogy—promoting multimodal composition, assigning blogs, teaching students to use wikis for collaborative writing, for instance—the more likely it is that other faculty will use and innovate with these technologies. But when digital ecologies go unused, the cyber commons is not merely unused and resting at steady state, it actually risks depletion. An extended example may help to illustrate this point.

Imagine that a college receives an external grant to support technological innovation and invests initially in laptops, software, and workshops to teach faculty and staff to incorporate the most recent technologies into their teaching. Through careful planning, the college makes internal grants available to faculty and staff willing to revise their pedagogies and share approaches within the community. The digital ecologists involved in administering the grant have the prescience to require that applicants document how they will evaluate and disseminate the results of their pedagogical innovations. As a result of this careful planning, the first wave of faculty and staff receiving the internal grants enthusiastically design and post Web pages about their efforts. They participate in conferences (e.g., EDUCAUSE, Computers and Writing), attend computing and teaching with technology symposia, and offer workshops to colleagues. They devote a summer to writing descriptions of their changed teaching practices for campus publications, and attend a summer institute devoted to teaching with technology. But all of this success, however commendable, does not guarantee that the digital ecology of the institution will be sustained. If the innovations commons has not been extended beyond the initial grant recipients or first wave of digital ecologists, it will, over time, deteriorate. The innovation commons depends on use to build it; those who do not use the commons actually deplete the digital ecology of their institution. The reasons behind such non-use may very well be at least partially rooted in the ways that digital ecologies are framed.

Impediments to Participation: Human Limits in the Digital Commons

Digital ecologists often confront seemingly technological limits that, at their roots, are actually quite human. Return, for a moment, to the hypothetical example of a college that receives a grant designed to promote technological education. Imagine that a staff member has lost interest in updating an online peer-tutoring schedule. After finding outdated information on the page, students stop looking there for information. The number of hits recorded for the page decreases, and eventually the staff members in charge of the page argue that there is no need for it because “no one uses it.” And, from one perspective, the staff members are absolutely correct. Just as innovation breeds innovation in the digital commons, stagnation breeds stagnation. In another pocket of the campus, feeling, like Jacques Ellul (1976), that “there can be no human autonomy in the face of technical autonomy” (p. 138), some faculty see no reason to attend the technology workshops provided by their colleagues, and, deep down, fear the potential loss of control that technological change might bring to their curriculum. Both of these instances, in different ways, deplete the innovation commons of the grant-receiving college because each instance represents a kind of non-participation. By identifying, challenging, and sometimes even working with the social and psychological limitations of the innovations commons, digital ecologists work to build sustainability.

Grazing in the cyber commons, whether the grazing consists of rethinking student orientation to online research or teaching students to write collaboratively using a wiki, involves embracing innovation—walking, running, or even falling into the unknown. It means either trying something that one has never tried before or perhaps trying something that no one else has tried before. Ultimately, grazing in and thereby sustaining a cyber commons involves maximizing innovation, the degree of which depends on individual users. Individuals have different comfort levels with innovation, so it stands to reason that they have different comfort levels with digital ecologies and that the movement of innovation through an institution—and thus its ability to sustain a digital ecology—depends in part on each individual's orientation to innovation, which may present formidable limits.

Everett Rogers' (1995) theory of innovation diffusion offers a way of understanding one element of human limits confronting digital ecologists. According to Rogers, innovation diffusion is "the process by which an innovation is communicated through certain channels over time among the members of a social system" (p. 5). Such innovation, as Michele Jacobsen (1997) pointed out, depends on the degree of and the relation to time of that particular innovation: "Because individuals in a social system do not adopt an innovation at the same time, 'innovativeness' is the degree to which an individual is relatively earlier in adopting new ideas than other members of a system" (p. 3). The type of innovation also impacts its degree of diffusion; an innovation such as course-management software, for example, might be more readily adopted and diffused than the integration of student-authored Web pages. But it is important to note that innovation for the mere sake of innovation is not what sustains a digital commons: rather, communication is the sustaining factor. And, although Rogers' theory has been used to interpret practices ranging from the adoption of farm equipment to instructional technology, it is, at its core, a theory of communication—in particular, communication among various categories of adaptors: early adopters, early majority users, late majority users, and laggards.

Rogers' (1995) taxonomy, like all taxonomies, is most beneficial if it is used to promote communication and understanding rather than static boundary construction or blame. For example, while the laggards (who appear to reject innovation entirely) could be viewed as a threat to a commons because they do not engage with it, they might also be viewed as valuable sources of information and understanding. The seeming limits to the sustenance posed by these individuals can be recast as opportunities to practice Wayne Booth and Peter Elbows' (2005) "rhetoric of assent"—opportunities to "find moments of genuine listening that do not naively surrender" (p. 386). Individuals have many reasons for rejecting technology, but until we listen to their objections we cannot know what those reasons are, nor can we appropriately address or negotiate them. Additionally, laggards can provide valuable insight into the reluctance of other users—perhaps they fear what a technical failure might do to a particular class lesson or they fear that posting student writing to the world through blogs would invite criticism of student work and consequently of their teaching. But until we listen to them, we cannot know.

Components of Participation in the Digital Commons

As Heidi Grunwald (2002) argued, Rogers' (1995) model of diffusion, though contested in some ways, has been commonly used as an explanatory construct in understanding—and, to a lesser extent, predicting—the extent to which faculty in higher education adopt instructional technologies. In addition to an individual's technological personality, the context of the technology itself will limit (or enhance) the digital commons. Rogers has identified five components of the technological context that impact the extent to which faculty adopt a particular technology: "relative advantage, compatibility, complexity, trialability and observability" (Grunwald, p. 22).

Relative Advantage

The relative advantage of instructional technology is the degree to which it is perceived as being an improvement over the pedagogy preceding it; *perceived* is crucial here. Some faculty have reacted against the promotion of cyberspace rather than against cyberspace itself. Andrew Ross (1994), for example, criticized an "Information Age boosterism" that seemingly offers no advantage whatsoever. Ross is representative of at least one form of resistance to digital ecologies when he asks,

> who really needs to be in the constant state of bounteous hypercommunication promised by all the ads? The blessed-out invitations to venture into cyberspace carry an undertow of retribution for those rash or obstinate enough to decline the Info Love Boat. Refuse this abundance and you will be perceived as obsolete: a citizen with no information access. (p. 273)

For Ross, commercial representations of cyberspace offer more peril than promise. At the same time, however, educational representations of technology may be more successful in explaining relative advantages. Course-management software, such as WebCT and Blackboard, for example, succeeds in contexts in which it is perceived as an improvement over previous practices. For some faculty, such improvements might be relegated to the software's ability to make course documents accessible to students—an improvement over hard-copy accessibility, which required students to carry materials with them (as opposed to being able to access them from any networked computer) and which made the replacement of lost materials more complicated for instructor and student alike. For faculty who had designed their own course Web pages, such software might not be an improvement, and might, for instance, provide them with fewer choices about the ways in which they make material available to their students.

Compatibility

The compatibility element of technology addresses the extent to which technology "is consistent with present values, past experiences or needs" (Grunwald, 2002, p. 22). Humanists who identify themselves with social justice issues may feel that technology has little, if anything, in common with their values as educators or with the overall mission of their institution. They may be unaware of the digital divide (Compaine, 2001; Norris, 2001) separating social classes and races, and that their technologically anchored pedagogy provides a means of narrowing the gap between those who are familiar with digital technologies (usually white and affluent) and those who are not (often people of color from lower-income households). However, humanists who rejects technology because of its incompatibility with their social justice values may actually be doing a disservice to the very students whose access to power they wish to increase. In these instances, the role of the digital ecologist may be to identify and explain the social limits placed on technological access to the individual who rejects technology out of hand. It is conceivable that the limit to the digital commons in this instance—an assumed incompatibility with social justice values—might be challenged by explaining that implementing educational technologies help to break down certain social inequities. It might also be helpful to provide instances in which digital technologies are helping to perpetuate democratic values.

It is also possible that educational technologies will be rejected for being incompatible with a humanist mission if they are perceived to diminish human expression or individual choice. As Nardi and O'Day (1999) explained, the "rhetoric of inevitability" that characterizes so many technological discussions forms a limit to its adoption and an impairment of agency in how that adoption happens: "We are concerned about the ascendance of a rhetoric of inevitability that limits our thinking about how we should shape the use of technology in our society" (p. 17). The idea that computers and digital life have arrived and are here to stay is an intimidating one that can disempower those who most need to be brought into the commons. In an interesting twist, this rhetoric of inevitability can be considered in terms of the discourse of limitlessness—that is, the ubiquity of technological advance means that it has no limits. It is unstoppable. Although the "limitless" potential of technology is a positive value for some, for others, "limitlessness" conjures images of conquest and subjugation.

Historically, the rhetoric of limitlessness has played a significant role in expansion and domination narratives—think of the notion of a vast and seemingly limitless frontier and images of expansion and conquest (Slotkin, 1985). Quite possibly, the narratives surrounding cyber expansion evoke similarly negative images of domination and control—values incompatible with the democratic objectives of education. Digital ecologists need to address this very real concern as they seek to sustain the cyber commons. It is quite possible that some virulent resistance is borne out of a reaction against the threat of being left behind and of being excluded. Luddite/technophile dichotomies have been well-documented, but this polarization, particularly for those seeking to sustain digital ecologies, can lead only to the "culture of blame" that Richard Selfe (2005) enjoined us to avoid. Arguing, for example, that faculty should adopt a particular technology because technology is everywhere or because it can do "anything" may actually diminish faculty's capacity to conceive of how technology can be used to perpetuate democratic values.

Complexity

A third element identified by Rogers as impacting faculty use of technology involves its complexity. As Grunwald (2002) observed, complexity refers to "how difficult a technology is to use and understand" (p. 22). Digital ecologists can address this limit to the digital commons by reducing technological complexity for those who are uncomfortable with it. Wheaton College's Web Director, David Caldwell (2007), who has spent decades helping individuals overcome various limits, noted that "academics are not particularly adventurous types." At Wheaton College, Caldwell's solution was to recognize faculty's limited comfort level using technologies and then to wait for demand to "bubble up." The demand, in this case, was for the kinds of objectives achieved by course-management software: "We had faculty using distribution lists, threaded discussions and e-discussions with no consistency." Once the demand was clearer, Caldwell was able to advocate for Blackboard and Frontier, a software that provides a template for creating Web pages. Here the faculty's limited ability and comfort level with technology was not an obstacle to contributing to the commons, but was instead a point of entry into it. There was a kind of tradeoff in this instance between limited functionality and accessibility, but in this instance the trade-off allowed for a greater diffusion of the technology. Faculty and staff had a springboard from which to innovate.[5]

Trialability and Observation

"Trialability," is another of Rogers' key concepts and refers to the fact that individuals are more likely to adopt technology when they are encouraged to test it. A limit to the extent to which faculty can test-run something is a limit to its adoption. A college that receives grant funding to support technology-enhanced teaching, for example, would do well to build ongoing workshops for experimentation. Rather than describing their successes and/or failures incorporating technology into their classrooms, the individual grant recipients might encourage colleagues to try out particular software in workshops. Such workshops permit the novice to experiment, slip, and even fall in a low-risk setting. The same experimentation and play that we encourage writing students to engage in should be used in sustaining the digital commons.

A fifth component of Rogers' innovation taxonomy pertains to the degree to which faculty can observe the technology at work. Faculty are more likely to adopt a technology if they can see the results of their work. Increasing such visibility includes practices such as encouraging faculty to request short reflective pieces from students about the technology; featuring work with technology in newsletters, announcements, and on Web sites[6]; and even using technological experimentation as a factor in tenure and promotion are all potential ways of making work visible.

Social Limits to the Digital Commons

Although Rogers' (1995) theory of innovation diffusion provides us with insight into how the digital commons may be limited through individual resistance to technological innovation, existing social structures may also provide limits that impede the commons. This next section argues that, in addition to working with and through individual limits, digital ecologists also need to address potential social limits to what they might achieve. These social limits also present opportunities for re-thinking, re-forming, and reengaging our educational mission and, in some cases, for remaking some tacit social divisions.

Henry Jenkins and David Thorburn (2004) have successfully drawn on the work of Raymond Williams to argue that electronic environments do not radically alter social contexts but instead emphasize existing tensions:

> the introduction of a new medium will engender debate about political culture but cannot by itself significantly alter the society in which it appears. Instead, the new medium generates an extended negotiation or contestation among

[5] Since then, Wheaton's digital ecologists, led by Scott Hamlin, have been able to design a pilot using Moodle, an open-source course-management software, for approximately eight faculty and their information technology liaisons. With backgrounds in a simpler technology (Blackboard) and knowledgeable support personnel, the pilot faculty are ready to work with a more complex technology.

[6] Organizations such as NERCOMP and Educause feature numerous activities for making this kind of work visible. Journals such as *Computers and Composition* and *Kairos: A Journal of Rhetoric, Technology, and Pedagogy* provide additional fora, as do electronic discussion groups like RhetNet-L and blogs such as Interversity.org.

> competing forces—some emergent, some well-established; some encouraging change, others resisting it; some publicly visible, others operating covertly (p. 5).

With an educational digital commons, such tensions generally emerge over curriculum—what students should be learning and how. A composition instructor who receives grant money to infuse a writing course with technology may very well find herself confronting what Fred Kemp (2005) described as the "aesthetic anvil" of traditional English departments. Bringing digital technologies to her class may actually bring to the fore long-standing debates about the teaching of "English"— to what extent it should conserve and preserve all that is good and true about English literature, and to what extent it should progress, consider new forms, and interrogate new modes of communication. As she moves ahead with her efforts, the digital ecologist may do well to engage her colleagues in what they value in student learning—that is, what their collective goals for students should be. This particular limit to the digital commons—what Kemp argued is a centuries-old disciplinary resistance to innovation—may also provide a much-needed opportunity for discussion, dissensus, and debate.

In advocating for an environmentally sustainable pedagogy, Owens (2001) noted that "a sustainable society cannot be created without sustainability-conscious curricula" (p.27). To sustain a digital commons thoroughly, institutions of higher education need to change their curriculum—by altering general education requirements, by changing requirements for majors, and by reconceptualizing new majors. Without reform, curriculum constitutes a negative limit to the digital commons and an impediment to innovation. Digital ecologists should devote some of their efforts to working with colleagues to overcome individual limits or resistance to technology, but they cannot ignore the power of structural elements to their work.

THE COMPLEX INTERCONNECTEDNESS OF DIGITAL ECOLOGIES

Given the proliferation of an electronic consumer culture emphasizing acquisition and immediacy, it is tempting for educators to become caught in a mad, monolithic rush of expansion: more bandwidth, more computers, bigger facilities. But digital ecologies are based on a complex interconnectedness of computer networks, of personnel, of shared ideas, and of access to information. If we extend Lawrence Lessig's (2001) construction of the digital commons to digital ecologies that depend on innovation rather than competition for sustenance, we can consider the obstacles to such sustenance more fruitfully. Digital ecologists become keepers of their own innovation commons and in so doing are obligated to recognize the dual role limits play. When deployed in the interest of increasing accessibility and democratizing the digital commons, some limits (such as those allowing only certain kinds of use on public computers) maximize the educational opportunities available to students. Other limits, which restrict creativity and communication (such as blanketly prohibiting certain acts of composing and sharing on public computers)—which are usually grounded in issues of property and ownership—threaten the commons.

Still other limits, such as faculty resistance to adopting technologies, need to be broken down into constituent factors. All entries into the digital commons involve forays into innovation. Limits to innovation, then, are potential obstacles to the sustenance of the digital commons. Rogers' work—which identifies relative advantage, compatibility, complexity, trialability, and observability as key factors impacting faculty adoption of technology—provides key points of entry for digital ecologists wishing to develop dialogue in, around and about the digital commons.

In a postmodern arena characterized by surveillance and commodification, it is easy to see the potential dangers of limits—threats to freedom of speech, the exchange of information, and the ability to experiment. When used to consolidate ownership and power, and thereby to prevent access to information and understanding, limits diminish a digital commons. Conversely, limits placed in the interest of stewardship—of maximizing access to the available technological resources—will protect the commons. Limits at the material level are based in resources: rooms, spaces, and even labor that has been commodified. Where resources are scarce, digital ecologists may indeed need to place limits to ensure that the broadest spectrum of individuals have the best possible access.

At the same time, a different kind of approach for ideational limits is warranted. The psychological propensities that lead some to embrace technology wholeheartedly while others reject it with equal passion need not be seen as obstacles. Rather, if we choose to group individuals along the innovation taxonomy developed by Rogers, it is quite possible that the limits become opportunities for dialogue and for genuine insight and understanding into why particular educational technologies will not work for some individuals. Listening to the most resistant individuals may provide ways for us to modify our practices and our positions to reach positions that are neither dogmatic nor skeptical but instead formed in the best possible space of critical thought.

In the case of socio-cultural limits that reduce access, digital ecologists may work best by naming and unmasking these limits, repeatedly demonstrating that supporting and sustaining the commons provides a way to address larger social inequities. By extension, failing to sustain the commons may mean that entry is left increasingly to those who already have the greatest and easiest access to power and privilege. The largest potential limit to digital commons everywhere lies in the risk of perpetuating social inequities. As cyberspace plays an ever-expanding role in who has access to information—and, ultimately, knowledge—those with the greatest and easiest entry to cyberspace will also be those with the greatest power. Their lives will at once be the most mutable, in the ways they are able to adopt cyber identities that tap into the most extensive storehouses of human understanding, and also the most enduring, in the ways they are able to write themselves into digitized memories and electronic history. Those without such access, those at the borders of cyberspace, may very well disappear. The digital ecologists who recognize such limits for their inequity and their constructedness already have access to the cyber commons even as they make it. They have the opportunity, then, to shape the commons in their own images: open, curious, diverse, and democratic. We can ask no more, nor can we commit the injustice of asking less.

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CHAPTER	16
TITLE	Old World Successes and New World Challenges: Reducing the Computer Waste Stream in the United States
AUTHORS	Shawn Apostel Kristi Apostel
OVERVIEW	This chapter considers the toxic waste stream of computers and computer components, and encourages us (i.e., technology-inclined academics) to consider even more carefully what sort of environmental impact we will be making as our projects and programs succeed. The current picture, incidentally, is both bleak and hopeful. The Environmental Protection Agency (EPA) says that from 2000 to 2007, upwards of 500 million personal computers will enter the municipal solid waste stream in America. This is a crisis not only because of the amount of computers for disposal, but also because of their toxic byproducts, including lead, mercury, and cadmium. This chapter looks at current techno-ecology patterns in the United States, identifying their potential and shortfalls, and, in order to find a solution to the challenges of the technology waste stream, compares them to similar activities in Europe, with a focus on Sweden, the most progressive nation on this issue. Unlike the top-down approach of the Europeans, North American consumers have formed grassroots organizations to confront the escalating computer waste stream crisis. We examine ideas and activities of American grassroots groups and suggest further approaches based on established European models to enrich technological sustainability in our institutions.
TAGS	Apple, authorization, BAN, Basel Action Network, Basel Convention, California, chemicals, chemicals, China, collection, Computers, consumers, corporate, Dell, developing, electronic, El-KretsenEU, European Union, evaluation, ewaste, e-waste, global, Gordon Moore, grassroots, hazardous, Kristi Apostel, Moore's Law, Norway, producers, REACH, recycle, registration, Shawn Apostel, toxic, toxin, trash, United States, Waste Electrical and Electronic Equipment, waste management, waste stream, WEEE
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Old World Successes and New World Challenges: Reducing the Computer Waste Stream in the United States

Kristi Apostel
Shawn Apostel

These words began their journey on a patched together, 8-year-old home computer (see Figure 1), and they continue on a PC that is one in a line of several, all of which differ in appearance, function, and speed. Like our home computer, the one that hosted these words as we composed this chapter was a mix of components from other, now dysfunctional, computers. This computer lived in the Finlandia University Teaching and Learning Center, a tutoring facility equipped with many hand-me-down machines from various offices and departments in the school. These machines include one that serves as a reading tool for students with disabilities, and one that never quite works correctly and usually has a sign taped to the front that reads “being rebooted,” followed by the most recent maintenance date available. Another computer hosts an old set of headphones used more for pleasure than for teaching.

Figure 1. Our patched-together desktop is now in storage, awaiting the completion of our vacation home, where it will once again host our ideas—as well as our children’s software. Photo by Shawn Apostel.

Although the computers in this facility are not the same as when originally purchased, they are, in fact, anomalies, according to “Moore’s Law,” born out of Gordon Moore’s (1965) observations that the average computer becomes obsolete within a 2-year time span. Moore, the co-founder of Intel, even predicted that this 2-year factor could surpass itself: “Certainly over the short term this rate can be expected to continue, if not to increase” (online). Writing for *The National Geographic*, Chris Carroll (2008), took this idea one step further by pointing out that “an unstated corollary to ‘Moore's law’ is that at any given time, all the machines considered state-of-the-art are simultaneously on the verge of obsolescence.” Similarly, trueCycle (2005), a self-proclaimed leader in asset management and recycling services, commented that “in 1997, the average life span of a computer was four to six years” (online). With such short life spans, computers—and their mounds of miscellaneous equipment—make up a rapidly growing amount of waste in today’s landfills. Not only are they filler for landfills across countries and continents, computers also carry with them an array of issues that every computer user should consider when contemplating the disposal of the old and the bringing in of the new. From hazardous substances inside computers to legislation on how, where, and who should recycle them, and from homes to businesses to schools, computers and the burgeoning electronic waste stream they help create are an undeniable part of the trash we produce.

Surprisingly, the amount of computers recycled each year in the United States is on a downturn in comparison to the increasing number of computers purchased. This imbalance creates a computer waste stream crisis, especially dangerous due to the hazardous chemicals—such as lead and mercury—that litter computer waste. The crisis has a “trickle-down effect”: Poor countries often receive old computers and the waste they generate from wealthier countries (Carroll, 2008). Some areas of the world are, however, confronting the computer waste stream head-on. The European Union (E.U.) has been a forerunner in this arena since 2003 with its Waste Electrical and Electronic Equipment (WEEE) Directive, which helps regulate hazardous electronic waste disposal while also working with producers and consumers to create a model system for responsible electronic waste disposal. Unfortunately, the United States (U.S.) has been slow to design similar federal laws, so some states, such as California and Massachusetts, are taking matters into their own hands. Several computer manufacturers—monitored by independent watchdogs—have also claimed some responsibility, while grassroots organizations design and enact their own methods of electronics recycling. Moreover, suggestions and solutions for how to take responsibility for our outdated computers demonstrate that the computer waste stream is a significant issue that, with time and willpower, can best—and sustainably—addressed.

In this chapter, we discuss the perilous global landscape of e-waste, perhaps one of the most critical sustainability-related issues we face. If we continue to erode our natural environment, then sustaining our workplace environments—our computers labs, our classrooms, and the other spaces in which we teach and research—is much more than a local matter, especially when viewed from a global, ecological perspective, such as we propose here. After discussing the perils of e-waste, we review some of the innovative directions taken by the E.U. for regulating waste, and we examine some of the steps being taken by U.S. state governments, by U.S. corporations, and by U.S. grassroots organizations. We close with recommendations for ways that educators can seek to reduce their department’s, program’s, and institution’s electronic waste stream. An appendix is included that charts efforts to slow the computer waste stream in the E.U. and in the U.S. (see Appendix 1).

A LOOK AT THE NUMBERS: E-WASTE ON THE RISE

Today, many people are aware that some old and unwanted, even intentionally recycled computers, end up in China, India, and various developing countries, where they are picked apart by hand, exposing impoverished workers to the hazardous components inside. Not until the National Safety Council and Stanford Resources, Inc. combined forces to conduct research on this topic did speculation on these issues become more than guesswork. As noted on the National Safety Council's Web site, "relatively few old PCs are being recycled and…most are stored in warehouses, basements, or closets or have met their end in municipal landfills or incinerators." The research, compiled in a 2006 report titled *Electronic Product Recovery and Recycling Baseline Report: Recycling of Selected Electronic Products in the United States*, "used data from 123 firms, including recyclers, third-party organizations that accept equipment for refurbishment and subsequent resale or donation, original equipment manufacturers (OEMs), and large corporate users of electronic equipment" (online). In 1998, 20.6 million computers in the United States became outdated; out of those, only 2.3 million were pledged for recycling. On their eCycling Web site, the U.S. Environmental Protection Agency (EPA; 2006), pointed out that, in the same year, "more than 9.7 million units (275 million pounds) of electronic equipment were recycled" and "6 percent of PC CPUs were recycled" (online). If the *Electronic Product Recovery* report numbers are consistent with those of the EPA, then the truth of the matter is that out of the 20.6 million outdated computers, the 6% actually recycled amounted to only 1.2 million. Indeed, as the EPA admitted, "the actual percentage of electronics recycled is low" (online). Over the past decade, these numbers have remained relatively unchanged.

Although the EPA predicted recycling in the electronics industry to increase 18% each year between 1998 and 2007, the amount of computers entering the waste stream has also risen dramatically. In her book *Garbage Land: On the Secret Trail of Trash*, Elizabeth Royte (2005) authenticated these numbers when she reported that the electronic waste stream in America is growing practically three times faster than the entire municipal waste stream, and, "according to the National Safety Council, nearly 250 million computers will become obsolete between 2004 and 2009" (p. 165). Furthermore, the Basel Action Network (2005), or BAN—which is the sole global organization concentrating its focus on "Toxic Trade," including trade in toxic wastes, toxic products, and toxic technologies—also reported that:

> The electronics and information technology industry is the world's largest and fastest growing manufacturing industry. As a consequence of this remarkable growth, combined with the phenomenon of rapid product obsolescence, discarded electronic equipment, or e-waste, is now recognized as the fastest growing waste stream in the industrialized world. (online)

Beyond waste stream growth and recycling predictions is the reality of what must be done with the refuse—discarded monitors, keyboards, printers, and mice. Recycling of e-waste is no easy task, and the difficulties of this job rise exponentially when we realize the amount of toxins people come into contact with every day when recycling old computer equipment.

THE TOXIC TRAIL: THE DANGERS OF IMPROPER RECYCLING OF E-WASTE

Exploring the nature of recycling computers and accessories, BAN (2005) recognized the problem of sugarcoating the task while overlooking very real dangers, noting that:

> too often, justifications of "building bridges over the digital divide" are used as excuses to obscure and ignore the fact that these bridges double as toxic waste pipelines to some of the poorest communities and countries in the world. While supposedly closing the "digital divide," we are opening a "digital dump." (online)

In many cases, the wealthiest countries are unknowingly dumping unusable and toxic e-waste products by sending supposedly recycled computer shipments to countries without the facilities to adequately dispose of the by-products. Assuming these products will be reused and recycled, wealthier countries are actually contributing to polluted air and contaminated drinking water—problems that obviously affect local areas, but also expand quickly beyond local borders to pose global problems. BAN led the effort to address this issue with the Basel Convention, ratified by 165 countries and signed by 168 (the three who signed the document but failed to ratify it were Afghanistan, Haiti, and the United States—the U.S. being the largest global producer of waste per capita; BAN, 2007, online).

Tam Harbert (2006) explored the issue of toxic e-waste in a recent online article in *OnEarth* magazine, a publication of the Natural Resources Defense Council. According to Harbert, too often the developing countries engaged in computer recycling "are increasingly victimized by a disproportionate burden of the world's toxic cyber waste" (online). As the United Nations Environment Programme (2004) has reported, 4 million personal computers end up in China every year. Furthermore, out of the mass of "recycled" computers that find their way to Nigeria, BAN (2005) detailed that:

> as much as 75% of the imported used computer equipment is "junk" and not economically repairable or resalable. And according to other local experts on the trade, an estimated 500 containers of used computer scrap of various condition and age, enter the country each month. Each container is said to contain about 800 computers or monitors, thus representing about 400,000 arriving each month. (online)

As overwhelming as the sheer amount of obsolete computers is, even more distressing is the amount of toxins released when these computers are broken down for recycling. Ill-equipped laborers in developing countries are exposed to toxins when they disassemble computers and other electronics. BAN (2005) has given an account of toxic trash heaps, official and unofficial, in Nigeria, where toxins leach "into the near-surface groundwater and are routinely burned, emitting airborne toxic chemicals such as dioxins, polycyclic aromatic hydrocarbons and heavy metals" (online). Like Nigeria, Ghana is also struggling with massive amounts of damaging e-waste, as Greenpeace (2008) reported in a YouTube publication. Finally, it is notable that such chemical hazards not only affect individual workers and local communities, but these toxic threats can also affect an entire country by hindering development of the country's recycling infrastructure. (For more detailed discussion of the impact of e-waste on developing countries, see Carroll, 2008.)

STEPS TOWARD RESPONSIBLE E-WASTE MANAGEMENT: THE EUROPEAN UNION EXAMPLE

Regulating the E-Waste Stream

Some areas of the world have sought to make immediate changes to their waste management systems. The E.U., for example, passed legislation in 2003 that, in part, requires careful watch of toxins contained in electronics and electrical equipment. The legislation, known as the Directive on Waste Electrical and Electronic Equipment (WEEE), allows for disposal of hazardous chemicals contained in electrical equipment. The Directive, in Annex II, notes that substances including polychlorinated biphenyls (PCB), mercury, batteries, cathode ray tubes (CRTs), chlorofluorocarbons (CFC), hydrochlorofluorocarbons (HCFC), hydrocarbons (HC), and asbestos must be removed before the equipment is landfilled.

Figure 2. Hazardous materials are separated at this collection site in the E.U. country of Sweden. These signs indicate that paint, batteries, oil, solvents, pesticides, and corrosive substances may be responsibly disposed of here. Photo by Shawn Apostel.

The E.U. continues to see a need for restrictions when dealing with hazardous chemicals. Two additional pieces of legislation, known as Registration, Evaluation, and Authorization of Chemicals (REACH) and Restrictions of Hazardous Substances (RoHS) have already passed and, as Harbert (2006) proclaimed, foster a positive example in the global landscape, where countries like Nigeria have faltered. According to Harbert, “a worldwide wave of legislation may not only stem the tide of e-waste but ultimately force manufacturers to change the way electronics are designed. The European Union was the first to adopt these new laws, and China is now following suit” (online). Specifically, RoHS restricts the amount of toxins manufacturers can use in an extensive range of products with electronic circuitry. Companies have to, instead, use non-hazardous components, such as “lead solder with tin, silver, or copper alloys” (Harbert, online).

REACH, ratified December 18, 2006, by the Council of Environment Ministers, was enforced in June 2007 (European Commission, 2007). The goal of REACH is to provide a means for the earlier detection of harmful chemical substances to protect both human life and the environment. What makes REACH stand above its predecessors is the freedom it permits manufacturers, a freedom that might not exist had the E.U. not formulated the WEEE Directive. In particular, REACH:

> gives greater responsibility to industry to manage the risks from chemicals and to provide safety information on the substances. Manufacturers and importers will be required to gather information on the properties of their substances, which will help them manage them safely, and to register the information in a central database. A Chemicals Agency will act as the central point in the REACH system: it will run the databases necessary to operate the system, co-ordinate the in-depth evaluation of suspicious chemicals and run a

> public database in which consumers and professionals can find hazard information. (European Commission, online)

REACH also encourages for gradual substitution of the most hazardous chemicals when appropriate alternatives have been identified. The emphasis on restriction, care, and stewardship is thus balanced by an emphasis on capability and competitiveness. That is, encouraging research and development activities to encourage all producers to devote development efforts to appropriate alternatives.

Legislating Consumers and Producers

Legislation in Europe goes well beyond regulating chemical substances—it also touches the individual consumer. The WEEE Directive (2003) extends to “all operators involved in the life cycle of electrical and electronic equipment, e.g., producers, distributors and consumers” (p. 26). The Directive includes consumers in electronic waste stream reduction. Measurements of success are also laid out in the Directive, for all E.U. member states must have ensured, by December 31, 2006, a collection amount of at least four kilograms, or just under two pounds, of WEEE on average per inhabitant per year. Plans are also in the works to increase this target number within the next 2 years. For these numbers to become a reality for the average inhabitant of a European home, the Directive requires that “convenient facilities should be set up for the return of WEEE… where private households should be able to return their waste at least free of charge” (p. 25).

WEEE standards carry over to producers, who must “provide at least for the financing of the collection, treatment, recovery and environmentally sound disposal of WEEE from private households deposited at collection facilities” (Directive, 2003, p. 30). Producer responsibility is, in part, what makes WEEE such a radical and innovative regulation. To abide by the Directive, producers must be responsible for the costs of recycling their products, and these costs must already be covered at the time a new product is placed on the market. Producer responsibility is essential to the recycling of WEEE, but recycling may not be the only option for electronic equipment seemingly at the end of its cycle—reuse, upgrade, and repair are other possibilities.

Providing for so many items and so many different stakeholders in the electronic waste stream is a daunting task for one legislative council to enforce. The European Parliament thought of this as well, and, consequently, delegated the responsibility of enforcement to the E.U. member states and their communities.

Sweden: An Exemplary Model of Enforcement

As a member of the E.U., Sweden has been a model for enacting the essential criteria outlined in the Directive. To reach exemplary status, Sweden began enforcing the Directive well before the deadline of August 2005. Working through its own service company, El-Kretsen (“the electricity circuit”), in 2004 Swedish collection sites acquired 87,000 tons of electrical waste—equal to 22 pounds per person in Sweden. This waste was recycled in 32 different treatment facilities located in Sweden and Norway, and contracted by El-Kretsen. In line with the WEEE Directive, El-Kretsen (2005) focuses on producer responsibility, making “Swedish companies who import, manufacture, or sell electrical products liable to offer its customers, households as well as businesses, an opportunity to leave corresponding discarded products for recycling” (p. 3; see Figures 2 and 3).

Figure 3. A “Farligt Avfall” (Hazardous Waste) collection site in Sweden. Collection sites like this one (just outside Vetlanda in Smäland) are located throughout the country and do not charge a disposal fee. Photo by Shawn Apostel.

El-Kretsen (2006) also includes private individuals, small businesses, and municipalities in its efforts. Cooperation among different stakeholders is, therefore, integral to reducing the electronic waste stream in Sweden, where even small neighborhoods in rural areas work with their municipalities to utilize collection sites, where anyone can go to drop off electronic waste free of charge. This has led to landmarks such as Sweden and El-Kretsen setting a world record in 2005 for recycling electronics, when 35.2 pounds of products per person were diverted from landfills.

When an end-of-life electronic product is brought to an El-Kretsen collection site in Sweden, it takes an extensive and careful journey down the stream toward recycling. At the collection sites, all electrical products are sorted into six different categories and then transported to a specialized recycling plant. The electronic product is then disassembled and the toxins are removed and organized for special treatment. When these tasks are completed, the separated materials are finally recycled. In 2004, the amount recycled increased by 10%; in 2005, the increase jumped to 28% (El-Kretsen, 2006, p. 8).

Efforts to Regulate E-Waste in Other Countries

Fortunately, Sweden is not a lone success. Even non-E.U. countries are combating the growing problem of electronic waste. Consider China, which has recently introduced and is in the process of approving new laws, proposed in tandem with enforcement approaches:

> China's RoHS directive may be even more stringent than the European version; it restricts the use of the same six materials—lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBBs), and polybrominated diphenyl ethers (PBDEs)—but allows fewer exemptions in the range of products affected. (Harbert, 2006, online)

Covering more than the restriction of hazardous chemicals, producers must include a disclosure with their products and must submit them to Chinese labs for certification. The disclosure will inform consumers whether or not the products contain toxic substances and "how long before these start breaking down and leaching into the environment, and whether the product[s] can be recycled" (Harbert, online). However, even these positive signs in China do not mean all is well. As a recent *National Geographic* report noted, the stricter regulations in China have led to the increase in e-waste in other Asian countries such as Malaysia due to illegal shipment of e-waste and toxic chemicals out of China (Carroll, 2008, p. 75).

THE SITUATION IN THE UNITED STATES

Legislation at the State Level

Unlike the E.U., China, and Australia, the U.S. government has been reluctant to pass top-down legislation regarding the reuse and recycling of computer waste. Instead, the U.S. prefers that companies and consumers take action; getting companies to agree, however, has proven difficult. For example, in 2004, after years of negotiating, personal computer and television manufacturers abandoned an effort by industry leaders, environmental groups, and government agencies to find a way to reduce electronic waste, because they couldn't agree on how the recycling fee should be passed on to consumers: at the point of purchase (preferred by television manufacturers) or when these products reached the end of their usefulness (preferred by the PC industry; Harbert, 2006, online).

With no federal laws governing the disposal of electronic waste, individual states are forced to implement their own plans, a highly inefficient method from a business standpoint (i.e., potentially 50 different laws for computer manufacturers to follow). A handful of states have passed laws prohibiting the disposal of cathode ray tubes (CRTs) in landfills, requiring that they be recycled at state-certified locations, and roughly half of the states in the U.S. have passed or are working on some form of electronic recycling laws (Harbert, 2006). One of the more progressive states is Massachusetts, which, with its state contract with ElectroniCycle, recycles all televisions and computers disposed of in the state, to recover 10 million pounds of electronics per year:

> technicians refurbish between 5 and 10 percent of their computers for resale; send another 5 to 10 percent to specialty repair houses; and smash the rest into fifty different categories of scrap, including plastic, copper, aluminum, barium glass, and leaded and mixed glass (which is recycled back into cathode-ray tubes). Reusable integrate circuits and memory cards are gleaned, then circuit boards are sent off site for recovery of gold, palladium, silver, and copper. Nothing goes overseas. (Royte, 2005, p. 172)

Like Massachusetts, California is concerned with contaminants in discarded electronics. Consequently, recycling of some products is regulated by state health and safety code hazardous waste laws. California also recently approved new laws regarding the management of CRTs in monitors and televisions; companions to this law include two bills on electronic waste passed during the 2001–2002 legislative session (California, 2007).

Other states that have passed or are considering e-legislation include Maine, Michigan, Minnesota, New Jersey, Oregon, Rhode Island, Washington, and Wisconsin. The efforts of states like these are commendable because, as forerunners in television and computer recycling, they encounter opposition from reluctant companies. For example, several major producers of electronics—including Sharp, Panasonic, and Philips—have opposed Massachusetts's e-bills, including a proposed producer take back plan, despite requirements to take-back their products in Europe (Computer TakeBack Campaign, 2006). Ironically, these companies use the WEEE initiatives in Europe to talk about how ecologically friendly they are:

> As an environmentally advanced company, Sharp is taking a proactive role in the global community [and]. . . will be actively involved in the business of recycling. Sharp is also working to accumulate know-how in product design that will facilitate recycling and is pursuing development of new recycling-related technologies for the E.U. region. (Sharp, 2007, online)

Panasonic (2004) has actually agreed to establish a take-back recycling scheme "in each Member State of the E.U. when Industry or Sector related collective schemes are not feasible or not cost competitive, [and to] supervise the entire recycling operations where necessary" (online)—this from the same company that opposed Massachusetts's legislation. Environmental considerations, admittedly, were not historically a major part of the electronics industry, which instead has focused, quite successfully, on developing the smallest, cheapest, and most quickly produced electrical equipment possible. The same ingenuity can be applied to reducing and recycling electronic waste; some promising moves in this area are made by producers of computer equipment, including Hewlett Packard (HP), Apple, and Dell.

U.S. Corporate and Grassroots Organization Efforts

HP operates a trade-in site that gives consumers credit for old computer equipment, including non-HP products. Consumers receive coupons for new HP purchases in exchange for their old monitors, central-processing units, and laptops, and also smaller items like PDAs, printers, and digital cameras (ComputerTakeBack Campaign, 2006). Dealtree.com provides a trade-in service for several companies, as well as checks or gift certificates for old computer equipment, depending on the brand.

Apple doesn't offer money or gift certificates for their old products, but they do have an environmentally friendly program. In 2006, Apple announced an expansion of its recycling program to include free computer take backs with the purchase of a new Macintosh system. However, these purchases have to be made at the Apple Store online or at an Apple retail store. When customers purchase a new Mac from these locations, they can request free, postage-paid packaging in which to ship their old Macs for environmentally friendly recycling, without the fear of their used computers being shipped overseas.

Dell offers more than Apple in its recycling plan, with free recycling for any brand computer products with the purchase of a new Dell, as well as free recycling of any Dell product whether a consumer is purchasing a new product or not. In addition, Dell (2007) has pledged to employ the same standards globally, and would like other computer companies to follow suit:

> To ensure a level playing field amongst all producers, Dell supports legislation under which all producers are responsible for proper end-of-life management of their electronic products consistent with our policy. Dell supports a policy framework that provides for individual producer responsibility for electronic products at the end of their useful lives. Individual responsibility requires each producer to work with consumers to properly collect and manage that producer's electronic products in an environmentally responsible manner. (online)

Which company is the best at recycling its own products is up for debate, largely because there is no uniform way to report what electronic waste is recycled. The As You Sow Foundation, an organization committed to ensuring that corporations and other institutions act responsibly toward sustaining both the human condition and a healthy environment, has conducted research on the recycling records of several large companies. The Foundation (2006) discovered that

> five major companies had disclosed electronics take back figures for portions of 2002, 2003 and 2004. They are Apple, Dell, Fujitsu, HP and IBM. Complete estimates for all five were available for only 2003. Our tally indicated that in absolute numbers of computer equipment measured by weight recycled in 2003, HP led its peers followed by IBM, Fujitsu, Dell and Apple. But looking at a rate of return analysis compared to sales for each company 7 years ago, we found that IBM was the take back leader, recycling 19% of equipment sold in 1996 followed by Fujitsu (13%), HP (7%), Dell (4%) and finally Apple (2%). Only Dell and HP have released data for 2004. Dell appears to have significantly improved its take back rate in 2004 to 9%. (online)

The problem with these numbers, according to As You Sow, is that each company had a different way of measuring what they recycled. For instance, IBM includes industrial products—large server units, for instance—in its weight tallies, and HP counted printers. Dell's numbers included electronic waste collected at recycling drives they funded.

Until a standard matrix is agreed upon, it will be difficult to measure and, therefore, evaluate the progress of companies producing electronic and computer equipment; several grassroots organizations, however, are attempting to address this issue. Among them are the Silicon Valley Toxics Coalition, the Basel Action Network (BAN), and the Computer TakeBack Campaign. These organizations created the "Electronics Recyclers Pledge of True Stewardship," which companies can sign, and, in return, have their name distributed to recyclers as a guarantee that the company follows "the best industry practices in environmentally sound management" (Computer TakeBack Campaign, 2002, online). Included in the nine-point pledge are promises regarding appropriately treating hazardous electronic waste, using the least polluting options for intermediaries, obtaining bonds to cover costs associated with closing an electronic waste facility, and continuing support for Extended Producer Responsibility (EPR) programs and laws. EPR is the credo of the Computer TakeBack Campaign, an organization formed by several environmental and social justice groups. The idea behind EPR is to encourage companies to design electronic equipment that can be easily repaired, packaged to reduce waste, and manufactured to contain fewer toxins; in addition, the EPR champions company responsibility for recycling and disposing of products it produces. Items cheap to disassemble, repair, and recycle will be cheaper to purchase, or will be more profitable for the company producing them.

Although the Computer TakeBack Campaign is focused mainly on domestic problems, other organizations in the United States, like BAN (2007), concern themselves with international issues:

> BAN works both domestically in the USA as well as globally with particular focus in Europe (due to strong leadership in global environmental initiatives), Asia (due to being primary victim area of toxic trade) and in the USA (due to poor record of global stewardship and their indiscriminate dumping of toxic wastes such as electronic waste and toxic ships). (online)

By working across borders, BAN is able to provide significant insight into electronic waste stream solutions. BAN is also able to call attention to the results of U.S. exportation of electronic waste to poor countries. Even in the absence of U.S. federal policy, there is significant momentum across grassroots organizations; in fact, many of these programs could serve (and many do) as world-wide models of electronic waste prevention.

The first organization formed to tackle computer recycling in the United States is the California-based non-profit Computers & Education and Computer Recycling Corporation. Started in 1991, this corporation works with municipalities and businesses to keep electronic waste out of landfills, while providing community and after-school training programs. In 2003, they diverted 6 million pounds of computer equipment from landfills. The organization began when three individuals saw two 20,000 square foot warehouses full of slightly outdated computer equipment go to waste after schools and nonprofits were told they were available. Initially, the founders—Wil Marshman, Mark Hass, and Steven Wyatt—faced the problem of getting people to accept a “recycled” computer. Today their facility serves as a model for world-wide reuse initiatives.

Another approach to computer recycling is to, ideally, create a computer-trained community of workers by offering inexpensive computers to low-income families as well as to the schools serving those families. Per Scholas was founded in 1995 with that intent; today, in addition to plucking some 200,000 tons of electronics from the waste stream each year, Per Scholas offers vocational training to help people obtain living-wage careers. Its facilities in the South Bronx and Miami employ 50 people, and provide services to 150 organizations, including JP Morgan Chase, the IRS, and Deutsche Bank (Per Scholas, 2007). Not only does this organization provide jobs, technology training, and low-price computer equipment, but it also provides environmentally responsible recycling for end-of-life equipment.

The approaches outlined above are exemplary, but do not even scratch the surface of the grassroots movement in the United States. Other examples include iRethink, whose members recycle smaller items, like printer cartridges and cell phones, for reward points. Schools and non-profits can use iRethink for fundraising, while encouraging electronic waste reduction (iRethink, 2007; Computers & Education, 2004). Also, the Computer Reruns program, administered by New Mexico Technet, Inc., is a good example of an organization providing a computer reuse service to a large corporation—Intel, in this case—and using the service to offer computer rebuilding training to high school and college students (Computer Reruns, 2007). Once refurbished, the computers are distributed within New Mexico’s school system.

RECOMMENDATIONS

Although numerous organizations and individuals in the U.S. are finding innovative ways to reduce and reuse electronic waste, all players in the recycling scheme must be diligent in researching companies and their approaches to computer recycling or disposal. Until the U.S. government, cooperating with producers and consumers, devises a system of standards for the proper disposal of electronic waste, we, as consumers, must take responsibility. As BAN (2005) warned,

> All businesses and citizens must ensure that none of their electronic waste discards are directed to the thousands of e-waste brokers and so-called recyclers now offering cheap rates and empty promises. Pains must be taken to uncover what may be false promises of “recycling or repair” and the ability to take your old computer “away.” That magical place called “away” might just be a burning dump on the other side of the world. (online)

Stemming the computer waste stream starts locally, as Americans stop discarding computers and their accessories without heed and, instead, look to examples overseas as well as in their own communities. Government models—like the WEEE Directive, El-Kretsen in Sweden, and the policies a handful of American states have adopted—provide appropriate approaches that assist consumers in working together with their government representatives to reduce the growing computer waste stream. In addition, U.S. consumers should consider supporting or joining grassroots efforts.

As educators, we should anticipate the waste stream future and request a computer recycling kit at the time of purchase (see Appendices 2 and 3 for a list of organizations and corporations that provide tools and kits). Of those mentioned here, Apple's program and Dell's Recycling Kit seem to be the most user-friendly. However, no matter the manufacturer, we must take the time to research what happens to the outdated machines that those kits help to package so nicely for recycling. At our institutions, we should look for under-funded departments or offices, and pass on a computer, printer, or keyboard when a newer model is purchased. In the event of a mass exodus of computers from any academic institution, there will always be another school that can use a ready-made lab. Even machines outfitted with discipline-specific hardware and programs can find a second (or even third) life (see Figure 4). We should use the technology we've come to know so well and get on email lists and discussion forums to set up our own virtual freecycling; sites like craigslist can help facilitate this work. University email lists can also be helpful when old computer parts pile up and need a new home. Moreover, we cannot forget the pull our institutions sometimes have in state and local government. We should encourage or, even better, become part of a coalition to lobby for stronger, safer computer and electronic waste stream recycling laws. Finally, across the United States and internationally, we must look from one government to the next to extract ideas that work and, consequently, use them to continue to build laws—such as REACH, RoHS, and, of course, WEEE—that lower the rising stream, thereby reducing the hazards a toxic flood will undeniably bring.

And, so, even though the words of this chapter have traversed across computers in our home and the labs in which we work, they end their journey on the 8-year-old desktop. Similar to its counterparts in the facility we described in our introduction, there will soon be a time when such machines will no longer be patchable. When this time comes, we, as consumers, must carefully evaluate the toxic potential of new computers and laptops on the market; by doing so, we will be following paradigms set by electronic waste reduction advocates everywhere. Even as a journey starts at the beginning, it must also find an end. At this end, we will help to begin again by performing the same level of research and care with a computer's disposal as we do with its purchase.

Figure 4. Computer parts and monitors await recycling at a collection site. Photo by Shawn Apostel.

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Appendix 1. Efforts to slow the computer waste stream in the European Union and the United States.

Europe and the Global Community			
Legislation/Effort	**Responsible Entity**	**Description**	**Date**
Basel Convention	BAN and global Community (168 countries)	Regulates post-consumer electronic waste to protect against damaging toxic trade	Late 1980s
Electronics Recyclers Pledge of True Stewardship	BAN, SVTC, Computer TakeBack Campaign	Encourages extended producer responsibility when manufacturing electronics	2002
WEEE Directive	E.U.	Regulates disposal of hazardous chemical waste; provides recycling standards for government, producers, and consumers	2003
RoHS Directive	E.U.	Limits amount of toxics producers can use in electronics	Adopted 2003; enforced 2006
REACH	E.U.	Requires manufacturers to register chemicals used in product creation	Ratified 2006; enforced 2007
State and Grass Roots efforts in the U.S.			
U.S.-based computer recycling	Computers & Education and Computer Recycling Corporation	Works with cities and businesses to divert e-waste from landfills	1991
U.S.-based computer recycling	Per Scholas	Offers inexpensive refurbished computers to low-income families and schools in their areas	1995
CRT ban	California	Regulates CRT disposal through state health and safety code hazardous waste laws	2001
eCycling partnership	A 10-state consortia, Electronicycle, and Recycle America Alliance	Work together to recycle all computers and televisions disposed of in 10 northeast states	2003

Appendix 2. Organizations that assist consumers with computer recycling.

Earth 911
https://earth911.com/recycling-guide/how-to-recycle-computers/
This well-known site offers a helpful list of links to articles, information, events, and locations about and for eCycling.

e-Stewards Responsible eCyclers
https://www.ban.org/find-recyclers
The Basal Action Network provides a list of companies that have signed the Electronic Recycler's Pledge of True Stewardship, BAN's most rigorous criteria for sustainable and socially just electronics recycling. The site also includes a state-by-state as well as international directory of these companies, including locations in Canada and South America.

Free Geek
https://www.freegeek.org/take-action/donate-technology
Any computer equipment, working or not, can be donated to Free Geek, which will repair usable computers. Free Greek promises that the computers which are not usable will be recycled responsibly. In addition, Free Geek also provides links to other eCyclers and information about eCycling.

National Technology Recycling Project
https://www.electronicsrecycling.org
The NTRP maintains a seemingly exhaustive database of computer recycling facilities in the U.S.

Plug-In to eCycling
https://www.epa.gov/recycle/electronics-donation-and-recycling
Plug-In to eCycling is a partnership between the EPA and consumer electronics manufacturers, retailers, and service providers. The program offers opportunities to donate or recycle used electronics to promote shared responsibility for safe electronics recycling.

Rethink Initiative
https://pages.ebay.com/pr/en-us/rethink/
The Rethink Initiative, hosted by eBay, brings together industry, government, and environmental organizations to confront the challenge of e-waste. The site presents information, tools, and solutions that make finding new users for idle computers and electronics easy.

"Ten tips for donating a computer: How to donate your used equipment"
http://www.techsoup.org/learningcenter/hardware/archives/page9675.cfm
A helpful resource by Jim Lynch.

TIA E-Cycling Central
http://www.eiae.org/
The Telecommunications Industry Association (TIA) is a leading trade association representing global information and communications technology (ICT) industries. The site provides links to eCycling in individual states.

Appendix 3. Corporations that assist consumers with computer recycling.

Apple, Inc.
https://www.apple.com/me/recycling/
Apple's recycling program allows customers to receive free recycling of an old computer and monitor regardless of manufacturer when they purchase a qualifying Apple computer or monitor.

Best Buy
https://www.bestbuy.com/site/services/recycling/pcmcat149900050025.c?id=pcmcat149900050025
Best Buy helps consumers dispose of the devices they use in their daily lives. In 2006 alone, more than 20 million pounds of e-waste were recycled through Best Buy programs. Best Buy stores offer free kiosks for depositing recyclables, and information on e-cycling grants, awarded to deserving communities in the United States, is available on the site.

Computer Reruns
http://www.reruns.nm.org/
New Mexico Technet's Computer Reruns has, since 1995, rebuilt computers donated by companies, organizations, and individuals, to place them in eligible schools and non-profit organizations.

Dell, Inc.
https://www.dell.com/en-us/lp/dt/dell-reconnect

When customers are ready to dispose of old PC and computer-related devices, Dell helps recycle Dell-branded products for free.

Hewlett Packard
http://www.hp.com/hpinfo/globalcitizenship/environment/return/index.html
HP offers its customers several choices—trade in, return for cash, recycle, or donate—to manage unwanted computers while simultaneously benefiting the environment.

CHAPTER	17
TITLE	Sustaining Scholarly Efforts: The Challenge of Digital Media
AUTHORS	Cynthia L. Selfe Gail E. Hawisher Patrick W. Berry
OVERVIEW	Increasingly, scholarship in English studies is dependent on the digital creation, exchange, interpretation, and manipulation of information, all processes that tend to demand collaborative authorship. Yet many scholars resist moves to accommodate new electronic forms of scholarship and collaborative work, fearing that work in the humanities may suffer irrevocably. In this chapter, we draw on our experience as scholars—two women, both senior, both in a relatively unconventional field within English studies, and one man versed in electronic forms of scholarship and part of a new group of scholars entering the profession. Our goal is to identify a small set of principles that describe what we consider to be a productive middle ground between the historically informed values of the humanities and the changes currently informing emerging information ecologies in digital environments.
TAGS	Ablex, CCDP, circulation, collaboration, Computers and Composition Digital Press, Computers and Composition Online, Computers and Composition, computers and writing, Cynthia L. Selfe, DALN, delivery, Digital Archive of Literacy Narratives, digital, ecology, English, feminist, Gail E. Hawisher, Hampton Press,information design, knowledge production, maintenance, media, MLA, Modern Language Association, organization, Patrick W. Berry, peer review, production, professional, research, scholarly, scholarship, social network, sustain*, technolog*, traditional
AUTHOR BIOGRAPHIES	Cynthia L. Selfe is Humanities Distinguished Professor in the Department of English at Ohio State University, and the co-editor, with Gail Hawisher, of *Computers and Composition: An International Journal*. In 1996, Selfe was recognized as an EDUCOM award winner for innovative computer use in higher education—the first woman and the first English teacher ever to receive this award. In 2000, Selfe, along with long-time collaborator Gail Hawisher, was presented with the Outstanding Technology Innovator award by the CCCC Committee on Computers. Selfe has served as the chair of the Conference on College Composition and Communication and the chair of the College Section of the National Council of Teachers of English. Gail E. Hawisher is professor of English and founding director of the Center for Writing Studies at the University of Illinois at Urbana-Champaign. She is widely published in digital media and literacy studies, and, co-edits, with Cynthia Selfe, the international journal *Computers and Composition*. Hawisher's publications include *Global Literacies and the World Wide Web* (Routledge, 2000) and *Passions, Pedagogies, and 21st Century Technologies* (Utah State University Press, 1999), which won the 2000 Distinguished Book Award at Computers and Writing. She and co-author, Cynthia Selfe, have also published the book-length study *Literate Lives in the Information Age* (Erlbaum, 2004), which uses life history interviews to look at how people of different generations have come to digital literacies, and, most recently, the coedited *Gaming Lives in the 21st Century: Literate Connections* (Palgrave, 2007). Current projects that she and Selfe are working on include *Transnational Literate Lives*, a multimodal book-length study that relies on video as a research, authoring, and presentation tool. In the past several years, Hawisher has been honored to receive from her department the Robert Schneider Award for Outstanding Teaching

	and Service (2000). Her university has also recognized her work with the Lynn M. Martin Award for Distinguished Women Faculty (2004), the Campuswide Award for Excellence in Undergraduate Teaching (2004), and the University Distinguished Teacher/Scholar Award (2005). Patrick W. Berry is a PhD candidate in the Center for Writing Studies and Department of English at the University of Illinois at Urbana-Champaign. His research concentrates on English teachers' literacy narratives as a family of genres to explore the intersections among literacy, personal experience, technology, and social class. His “Critical Remediation: Locating Eliza” appeared in *Kairos: A Journal of Rhetoric, Technology, and Pedagogy* in 2007.
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Sustaining Scholarly Efforts: The Challenge of Digital Media

Cynthia L. Selfe
Gail E. Hawisher
Patrick W. Berry

Organizations and institutions, intellectual work and global communication, computer networks and electronic environments have all converged in the past decade or so. The changes have altered models of work and information in a range of sectors—many of which are increasingly dependent on the digital creation, exchange, interpretation, and manipulation of information. Among these changes are a growing recognition of the value of collaborative groups and their role in knowledge production (Nardi, Whittaker, & Schwartz, 2000); a new appreciation of sharing and building associations as powerful and underappreciated tools in information economies (Johnson-Eilola, 1995); an acknowledgment of new semiotic channels and modalities for conveying meaning (e.g., digital audio, video, animation, multimedia); and a focus on the efficacy of digital informational resources leveraged by peer production (Benkler, 2004).

Although these trends are increasingly visible and influential in a range of public, business, and governmental sectors, they have yet to fully permeate the humanities, or, more specifically, departments of English, with which we are most familiar.[1] Many of these academic units retain long-standing historical and cultural values that seem highly resistant to new forms of knowledge production, especially those situated within digital environments—among these, a value on the scholarly and research performance of individuals rather than teams; a value on conventional forms of information exchange, particularly printed books and journal articles; and a value on models of scholarly production tied to institutional capital in university presses and professional journals (MLA Task Force, 2007).

For those scholars who recognize the strengths of both *conventional* and *emerging* forms of knowledge production, this situation is becoming increasingly problematic to negotiate, especially for junior scholars working toward tenure. Indeed, the current situation presents senior scholars with an important ethical challenge: to establish an increasingly sustainable system of scholarly production in English departments—one that works both for scholars who want to retain traditional values of humanist scholarship and those who see needed changes in such values. Although some of this work can be undertaken by revising departmental guidelines for tenure and promotion (e.g., updating them to accommodate new electronic forms of scholarship and collaborative work) other approaches, for instance, may be more complex and may involve scholarly leadership that bridges the local, micro-level sites of departments, the medial-level institutional environments within which such departments function, and the macro-level national contexts that help shape our professional values.

[1] Because many of our colleagues reside, if not in departments of English, in humanities programs, we specifically discuss these departments in this chapter. We intend, nevertheless, for our discussion to apply to those computers and writing colleagues who make their academic homes in other disciplinary units across the university.

In this chapter, we draw on our experiences as scholars—two women, both senior, both in a relatively unconventional field within English studies, both committed to collaborative work, and one man versed in the electronic forms of scholarship and part of a new group of scholars entering the profession. Our goal is to identify a small set of principles that describe what we consider to be a productive middle ground between the historically informed values of the humanities and the changes currently informing emerging information ecologies in digital environments. These principles also serve as guides to the kinds of scholarly leadership efforts that we mention above—efforts that seek to bridge micro, medial, and macro-levels of our professional work—and that help to establish increasingly sustainable systems of scholarly production for other scholars and for ourselves. In short form, these are as follows:

1. The profession of English can retain its traditional value on scholarship that is original, innovative, intellectual, and sustained, peer-reviewed and published, while acknowledging that scholarly fields, forms, and values change.

2. Scholarly models of production and form are not fixed. Rather, they are fluid—socially and technologically shaped and contingent. Contemporary scholarship, increasingly, is created, maintained, and circulated in a range of electronic environments that extend the intellectual reach of ideas and the development of academic fields and subfields.

3. Given electronic contexts, current scholarship can increasingly employ multiple semiotic modalities (words, still and moving images, video, audio) to convey meaning in increasingly effective and robust ways.

4. Social networks and collaborative scholarship, especially when they are informed by feminist values on sharing and connection, can multiply and leverage the innovative contributions of new scholarly projects. They can also help increase the sustainability of such projects.

These principles—heavily inflected by feminist values, emerging models of work in digital environments, and long-standing ideals in composition studies—have provided us a way of sustaining research and scholarly efforts over a period of decades. Importantly, informed by the work of Donna Haraway, we consider these principles partial, contingent, fluid, and situated. They are neither objective nor generalizable, but rather our own form of coyote knowledge that others may, or may not, choose to stitch into their professional lives—in various transformed, partial, and complex ways (Haraway, 1988).

THE CHANGING CONTEXT OF DIGITAL KNOWLEDGE MAKING AND INFORMATION COMMUNICATION

The backdrop for the intellectual work of this chapter is complex and woven from multiple and related contexts. In part, it has emerged from our location in an area of composition studies—computers and writing—that focuses on the study of information technologies and their use in literacy instruction and practices. From this position, for instance, we have followed a series of related trends in information production and exchange that have emerged from a converging set of technological changes and practices we mentioned above.

The multiplied power of peer collaboration, which has been a consistently valued practice in composition studies since the initial interest in social constructivism (Berger & Luckmann, 1966; Bruffee, 1984), has enjoyed a similar emphasis within the corporate sector since the early phases of globalization in the 1980s, when U.S. businesses began to emulate the team-based practices of Japanese communication styles. In the 1990s, however, collaborative practices experienced even more rapid growth as new digital networks and digital work environments expanded in their international reach and importance. Moreover, personal social networks across workplaces continue to assume increasing importance. As Bonnie Nardi and her colleagues (2000) pointed out, personal networking is not necessarily new—it has been explicitly identified since 1940 to denote the cultivation of “useful others”—but what is new “is the intensity and absolute necessity of networking for practically everyone” (n.p.).

By the 1990s, and within ever-changing social, historical, and technological contexts, as Deborah Brandt (1995) pointed out, digital literacies were accumulating rapidly. Manuel Castells (1997) described a range of groups that had begun to assemble and communicate online—within digital networks that were contributing to the breakdown of conventional geopolitical borders and the rise of globalized politics. Within such environments, Castells described social groups that not only worked online—for emerging multinational corporations had to connect workers across conventional linguistic and cultural borders—but that also involved offline self-sponsored literacy activities related to new kinds of identity politics. Within digital environments, these social groups and networks formed interest groups; political action groups; and groups focused on feminist, racial, environmental, or religious issues. Also forming in such spaces were social groups focused around gaming, dating, genealogy, films, music, and other interests. Importantly, Castells noted that as people were exchanging ideas and work within and among such groups—and often taking action collectively—they were also involved in contesting, negotiating, and re-writing the new “social codes” under which societies would be “re-thought, and re-established” (p. 360) in the coming decades.

Communicative practices, it was clear, were beginning to change dramatically within globalized online environments where texts were, increasingly, crossing national borders, time zones, language groups, and geographic distances. As scholars from the New London Group (Cope & Kalantzis, 2000; Kress, 1999; Kress & van Leeuwen, 1996) and others noted, people could no longer afford to think of texts in monolingual, monocultural, or monomodal terms. Within online globalized environments for composing and communication, texts needed to resist the limitations of a single symbolic system and its attendant conventions, taking increased advantage of multimodalities of expression: visual, aural, and kinesthetic elements, as well as alphabetic components. To increase their effectiveness, texts also had to become highly intertextual in terms of their resonance across media types.

By the beginning of the new century, digital environments had begun to spawn not only new forms of composing and communicating, but also new models of information design and production, maintenance and organization, delivery and circulation. Of particular interest for the purposes of this chapter are new practices of collaborative peer production that have resulted in the emergence and growth of social-networking phenomena like Wikipedia, YouTube, de.li.cious, LinkedIn, MySpace, and Flickr. Such projects depend on the personal contributions and investments by large and far-flung social networks of people who choose to come together to create online “commons” (Benkler, 2003) that are defined, variously, by an expanded freedom to shape involvement, including the timing, extent, and conditions of involvement; value as and to contributors; freedom from some of the constraints normally accepted as “necessary preconditions to functional markets,” and by “more or less elaborate rules—some formal, some social conventional—governing the use of the resources” (Benkler, 2003, pp. 6–7).

THE CONTEXT OF ENGLISH DEPARTMENTS

If English departments and related programs in the humanities have yet to embrace fully many of these new patterns of information design, production, and exchange that have come to characterize globalized digital environments, they have, nevertheless, been fundamentally affected by these trends. The recent report of the MLA Task Force on Evaluating Scholarship for Tenure and Promotion (2007), for example, identified a related set of concerns in the profession—among them, increasing demands for scholarly productivity within universities engaged in a "prestige economy" (Chait, 2002, qtd. in MLA, 2007, p. 11); shrinking resources for humanities publishing, especially among university presses; and an almost single-minded focus on the scholarly monograph as the "gold standard" (p. 5) of academic excellence.

The "widespread anxiety" (p. 1) prompting the 2007 MLA report has considerable basis in fact. As the report acknowledges, over 62% of the departments responding to an MLA survey "reported that publication has increased in importance in tenure decisions over the last ten years" (p. 4), with 88.9% of the departments in Carnegie doctorate-granting, 44.4% in Carnegie master's, and 48% in Carnegie baccalaureate institutions ranking the "publication of a monograph as 'very important' or 'important' for tenure" (p. 4). In addition, 32.9% of all departments and 49.8% of departments in doctoral-granting institutions expect "progress toward the completion of a second book for tenure" (p. 4). A related value is placed on articles in refereed scholarly journals, which only 1.6% of departments characterized as "not important" (p. 5).

Fueling anxieties about such requirements, the report found, were several factors. First, the report noted the gradual but persistent decrease of funding for higher education, which has resulted in the "corporatization of the university" along "business models of efficiency and output" (MLA, 2007, p. 16). For university presses, the report points to the work of the MLA Ad Hoc Committee on the Future of Scholarly Publishing (2002) and Phil Pochada's statement that "these presses have increasingly been asked to operate as businesses that must cover their costs and had lost or sharply reduced their subsidies from the institution" (qtd. in MLA, p. 16). Presses have responded, in part, by "discontinuing publication in certain Humanities subjects altogether" or "reducing the humanities list," thus "narrowing... publishing possibilities, especially in fields viewed as marginal" (p. 16).

A second source of anxiety is the disconnect between the profession's increasing dependence on electronic scholarly resources and its lack of experience in evaluating such materials. Indeed, 4.8% of departments in doctoral-granting institutions report "no experience evaluating refereed articles in electronic formats" and 65.7% report "no experience evaluating monographs in electronic formats" (p. 5). While neglecting new electronic publications as a source for tenure, many in English departments have also come to see new digital networks and electronic forms as heralding the "end of… [the page's] influential reign. Old document forms and institutions—books, journals, and newspapers, on the one hand, publishers, and librarians, on the other, seem about to dissolve" (Brown & Duguid, 1996, p. 14).

A third source of concern is the recognition that faculty are working harder than ever. Referencing work by Jack Schuster and Martin Finklestein, the MLA report noted, "the weekly work effort of faculty members across institutional types increased from 40 hours per week in 1972 to 48.6 hours in 1998, and it increased most dramatically to 50.6 hours, at research universities where faculty have been subjected to both increasing instructional and research demands" (p. 14). We would argue that these statistics are especially alarming for junior faculty who struggle to establish a series of sustainable scholarly, teaching, and service practices.

PRINCIPLES OF FEMINIST SCHOLARSHIP AND SUSTAINABILITY

What strategies, then, might help senior scholars bridge the complex series of gaps between the new systems of digital knowledge production and the more historically informed values that shape departments of English—in ways that make scholarly effort sustainable for both senior and junior colleagues? In this section, we focus on three principles that have guided our thinking and scholarly efforts, and that may, or may not, work in modified ways for others. In explaining these principles, we focus on our situated experiences as scholars and on the tenets of feminist theory that have shaped our thinking. Once again, we offer important cautions to readers:

First, the story of how we identified these principles is, in part, a fiction necessitated by the context of this writing task, one composed by memory and, thus, highly susceptible to selective perception and editing. In short, these principles have emerged not fully formed, but in fits and starts, wrong turns and returns, revisions and rethinking, over time. Indeed, they are still emerging and changing.

Second, we do not consider these principles generalizable in their specifics; rather, their value, if they have any, rests in their ability to sketch the general topography of a third way, a middle ground between the historical values that continue to inform departments of English and the rapidly changing contexts for scholarship that provide exciting potential for new generations of scholars.

Finally, our intent in this chapter is to promote multiplicity, flexibility, and sustainability—in part by resisting the adoption of any single model, any single standard, or any single approach to scholarship, scholarly efforts, or scholarly careers.

Our hope, then, is that somewhere between the personal situatedness of experience and the explanatory power of theory, others might find ways to use and modify the principles we have identified; that others might articulate their own ways of working toward a sustainable and flexible set of approaches to scholarship; and that they might discover new ways of addressing the needs of both junior and senior faculty, recognizing the innovative contributions of colleagues with both conventional and unconventional approaches to knowledge production, exchange, and distribution.

Principle #1: The profession of English can retain its traditional value on scholarship that is original, innovative, intellectual and sustained, peer reviewed, and published, while acknowledging that scholarly fields, forms, and values change.

Change, we are convinced, produces less anxiety and less resistance when individuals and groups—both those who *support* change and those who are *resistant* to change—can focus on shared values. It is within the context of this middle, and more sustainable ground, that much of our work as journal and book series editors has proceeded over the past decades. For us, this understanding does not imply a reluctance to support and embrace change, especially of the kind inflected by feminist theory and practice. It has, however, allowed us to pursue change in ways that our colleagues and departments have accepted and supported, even in institutions often dominated by historically informed values on scholarly forms and productivity standards, and in a rapidly changing technological field that is also occasionally influenced by such values.

When we first began work in this field in the early 1980s, for example, few journals or presses specializing in English studies were willing to publish work on technology and fewer were willing to do so on a frequent basis. In the minds of many colleagues, this emerging field seemed antithetical to humanist values and scholarly traditions that focused primarily on historical and print-based texts. At the same time, English departments placed value on scholarship that was intellectually innovative and sustained, on refereed print publications, and on rising standards of productivity for scholarly projects. Our challenge, then, in response to such an environment, was to acknowledge the continuing value of published scholarship in print-based environments, while identifying peer review processes and social networks that could help us make such scholarly projects better, and more sustainable than relying on our own efforts alone. Four kinds of approaches grew out of these related realizations. The first approach we found to be of value—despite the prevailing academic value on single-authored scholarship in many departments of English—was a commitment to scholarly projects that involved collaboration and social networks. In part, this approach was made possible in the early 1980s by personal computers and the exchange of floppy disks, then later by digital networks and the exchange of email messages, and even later by the exchange and electronic editing of files (Hawisher & Selfe, 1998).

Using these particular technological tactics, we worked with colleagues across the country to edit an early set of anthologies that focused on issues of importance to the increasing numbers of teacher/scholars who were beginning to use and study information technologies in English composition classrooms (see Hawisher & LeBlanc, 1992; Hawisher & Selfe, 1991; Holdstein & Selfe, 1990; Selfe & Hilligoss, 1994). Authors in these anthologies focused on the best ways of integrating computer technology into humanist classrooms; the effects that such technology seemed to be having on the literacy practices and products of teachers and students; the need for professional development and departmental support; and our call to develop critical perspectives on technology. In completing these early co-edited book projects, we followed a commitment to collaborative scholarship that drew on the talents of multiple authors, but that were also refereed through the conventional peer review processes valued within English departments at that time. Importantly, for us, this work also involved building *intensional networks* (Brown & Duguid, 1996) of colleagues around the country who helped extend our personal interests in computers and writing more broadly and extensively, and who could be counted on to understand, appreciate, and formulate critical perspectives on our work. These intensional networks—that is, networks that grew out of intense and productive communication among individuals across boundaries—eventually took an international turn, with colleagues in Australia, Greece, Egypt, and Norway participating and extending the reach of emerging communities of practice (Wenger, 1998).

In a second social and scholarly effort, we began and edited a new print journal, *Computers and Composition*[2]*,* which focused on the needs of teachers experimenting with technology in English composition classrooms. This journal, too, was made possible, in part, by the support of far-sighted departmental chairs and, in part, by a changing technological environment that put the power of design, layout, and production within our reach as scholars. Early issues of the journal were created on an IBM Selectric and duplicated; later editions were produced on

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[2] The original founders and editors of *Computers and Composition* were Kathleen Kiefer, Colorado State University, and Cynthia L. Selfe, Michigan Tech University. In 1988, Gail Hawisher, University of Illinois, Urbana–Champaign, became co-editor of the journal with Cynthia Selfe. This collaborative continues to edit the journal at present, although the editorship is aided on a continual basis by talented graduate student associate editors at their respective institutions and a series of innovative guest editors who propose special issues, which are published regularly.

a personal computer using word-processing and page-layout software. As the journal developed, communication with authors and reviewers was conducted by email as well. As a scholarly project, *Computers and Composition* was both conventional and revolutionary. The print form of the journal and, as it developed, its reliance on accepted peer review processes and its eventual association with established scholarly presses (e.g., Ablex and Elsevier) acknowledged existing scholarly values in departments of English. At the same time, the journal's emphasis on computer use in composition studies, technological experimentation, and emerging forms of scholarship helped push the boundaries of the field in ways prized by colleagues who placed value on technological innovation. The journal further extended the intensional networks we had established around our scholarly efforts, drawing on the many talents of colleagues at other institutions who reviewed contributions, wrote articles, recruited authors, and read the journal's contents.

As we gained experience with various kinds of collaborative scholarly projects, accumulated the required cultural capital of published work, and extended the professional networks on which our work depended, we noted that other scholars in the emerging field of computers and writing had similar needs. To meet these needs, and to accommodate longer-sustained scholarly projects, we began a third major scholarly effort involving the editing of three different book series—the first with the National Council of Teachers of English, and the second and third with Ablex and Hampton Press, respectively. Like many of our projects, these series have incorporated both conventional and unconventional features. They have all recognized, for instance, existing and historical values on excellent, peer-reviewed scholarship in the form of printed books, and, importantly we believe, the role of the single-authored scholarly monograph. Several of the volumes published in the series, however, have also made room for the collaborative scholarship and edited collections that scholars entering the profession have used to establish their own scholarly identities and social networks (titles in print as of our writing of this chapter include Alexander, 2005; Alexander & Dickson, 2006; Allen, 2002; Blair & Takayoshi, 1999; Coogan, 1999; Crow, 2006; Grabill, 2007; Gruber, 2007; Hawisher, LeBlanc, Moran, & Selfe, 1996; Howard, 1997; Johnson-Eilola, 1999, 2005; Kalmbach, 1996; McKee & DeVoss, 2007; Palmquist, Keifer, Hartvigsen, & Goodlew, 1998; Porter, 1998; Rouzie, 2005; Samuels, 2006; C. Selfe, 2007; R. Selfe, 2005; Sloane, 2000; Snyder & Beavis, 2004; Sullivan & Porter, 1997; Takayoshi & Sullivan, 2007).

These series, too, have increasingly taken advantage of digital networks and electronic forms of exchanging information. Most of the authors involved, for example, wrote in digital environments, corresponded with us as editors and their colleagues via these networks, and focused their scholarship on the literacy practices characterizing such networks. A recent book in the Hampton series, moreover, includes a DVD that features student-made examples of digital video and audio compositions, and makes room for digital media formats within the conventional form of the book (Selfe, 2007).

A fourth project that we undertook to accommodate conventional academic values—and, to, at the same time, pursue a commitment to the changing forms of knowledge production in digital environments—involved identifying a series of national awards for print and, more recently, digital publications. These awards had, and still have, multiple goals. On one level, they are designed to acknowledge the academy's historical focus on scholarship characterized by innovation, reach, and intellectual excellence. On the other hand, they are designed to recognize the work of scholars struggling to publish in an emerging area within English studies. We began in 1990 with the annual Ellen Nold Award for the best article in computers and writing, along with the Hugh Burns Award for the best dissertation. In 1998, we introduced the *Computers and Composition* Distinguished Book Award, suggested by Johndan Johnson-Eilola, to recognize the book-length contributions that sustain scholarly projects within the field. In 2005, we added the Charles Moran Award for Distinguished Contributions to the Field, to recognize significant pioneering work that often goes unrecognized. Most recently, we have begun awarding the Michelle Kendrick Prize for Digital Production/Scholarship. With this award, we are seeking to honor and call attention to new forms of scholarship, and new forms of digital production and exchange that graduate students and faculty members in digital media studies are finding of increasing interest.

Although these awards carry relatively modest prizes, their effect has been magnified by their national competitiveness, the involvement of respected scholars serving as judges, and the recognition of their import by members both within and outside the computers and writing community. As a result, these awards have added considerable weight to the profiles of ground-breaking individuals and their outstanding work. These awards have convinced us that when a community of knowledgeable scholars pays positive attention to outstanding work, others colleagues are prompted to do so as well.

Principle #2: Scholarly models of production are not fixed. Rather, they are fluid, and socially and technologically shaped and contingent. Scholarship, increasingly, is created, maintained, and circulated in a range of electronic environments that can be used to extend the intellectual reach of ideas and the development of academic fields and subfields.

By the beginning of the 21st century, the use of scholarly materials in digital forms had become commonplace for English faculty: electronic databases of digital materials (e.g., The Wilfred Owen Multimedia Digital Archive, Project Perseus, The Vergil Project at the University of Pennsylvania, the Rossetti Archive, The William Blake Archive), online journals (*Kairos: Rhetoric, Technology, and Pedagogy; Enculturation*; *Computers and Composition Online*), and digital tools for searching and finding information, conducting original scholarship, and composing (Google Scholar, HyperResearcher and InterClipper, Microsoft Word, Adobe Dreamweaver, Windows MovieMaker and Apple iMovie, among many others). It remained less common, however, for departments of English to value scholarship published in digital venues, using digital forms of collaborative production and adopting emerging digital formats.

In responding to this dynamic context, we attempted to balance conservative and not-so-conservative values in ways that seemed sustainable at the time and within the situated contexts of our academic lives. We continued to recognize the disparate models of scholarship in play at the time, as well as to recognize the profession's value on peer review and intellectual excellence in scholarly projects while taking advantage of changing digital environments to support new models of design, production, exchange, and circulation.

More specifically, during the 1990s, we initiated an online version of the print journal, which came to be called *Computers and Composition Online*. Various iterations of this journal, edited first by Keith Comer, then in Sweden, and Margaret Syverson, at the University of Texas, have been in existence since 1996. Sustaining this effort, however, has not always been easy, especially in the 1990s. As much as we believed that the profession was ready for online publication, academic departments still viewed electronic articles as less rigorous than their print counterparts, and authors were understandably cautious in publishing online. In 2002, however, when Kristine Blair, at Bowling Green State University, assumed the editorship, the journal began to focus on texts that could not be fully or adequately accommodated by print publications. These pieces included articles that featured video and audio content, hypermedia documents, and webbed text. Although we still worry about adequately preserving early issues of the journal, thanks to Blair's farsighted-leadership, *Computers and Composition Online* provides a valuable instantiation of arguments being articulated by scholars in the New London Group (among them Cope & Kalantzis, 2000; Kress, 1999, 2000; Kress & Van Leeuwen, 1996), who had begun to recognize the contributions that various semiotic modalities made to complex communication tasks and the inability of any one modality to fully convey meaning. To sustain the considerable effort associated with *Computers and Composition Online,* Blair, too, relied on tenets of feminist networking and involvement: encouraging talented graduate students seeking editorial experience to participate on the journal's staff, weaving the journal and its operations into the institutional fabric of her university, and using her extensive personal networks to recruit outstanding scholarship and encourage scholars. Blair's key strength in this effort is her recognition that sustainability factors will continue to figure centrally in the rapidly changing technological landscape the journal inhabits. She understands, as do we, that sustainability is an ongoing concern, not a short term project. With Blair's always-conscientious attention to the journal, we continue to search for additional ways to ensure both the online journal's history and its future.

Establishing *Computers and Composition Online* gave new intellectual definition to the print journal and provided scholars and practitioners in the field another valuable venue for new forms of digital media scholarship[3], one that retained a value on peer review and excellence while accommodating new forms of academic projects responsive to the new communicative and scholarly forms created, exchanged, and circulated in extended electronic networks. *Computers and Composition Online*, for example, published a special issue on sound as a compositional space in fall 2006 (edited by Cheryl Ball, Illinois State University, and Byron Hawk, George Mason University) that included a range of sound files and examples that could not have been reproduced in a print format.

The rapid extension of digital networks was also having effects on the print journal, *Computers and Composition*, which continued to transform itself in response to changing and contingent digital contexts. When the journal was acquired first by Ablex in 1994 and then by Elsevier in 1999, for instance, its international reach became even more pronounced. Elsevier moved to a new electronic editing and delivery system in 2005, creating a new set of challenges and possibilities for the journal. As an Elsevier journal, for example, *Computers and Composition* was bundled into the publisher's ScienceDirect offerings, which were marketed to libraries as a consolidated group for a considerable subscription fee. This strategy—when coupled with increases in production costs and journal subscription costs experienced by other presses and journals—stretched already overtaxed library budgets in ways that have, at times, been painful to observe.

At the same time, however, the fact that the print journal was available in an electronic venue as well as in print meant that increasing numbers of libraries around the world had access to the information contained in the journal in a timely manner. As the journal became increasingly available online, for instance, subscriptions outside the United States rose dramatically, as did opportunities to encourage submissions from scholars in other countries. In 2007, for example, *Computers and Composition* was not only being read in more than 64 countries around the world, but also published special issues focusing on international contributions (edited by Taku Sugimoto at Chiba Institute of Technology, Japan) and on computer gaming (co-edited by Matthew Johnson, Southern Illinois University at Edwardsville, and Pilar Lacasa, University of Alcalá, Spain). Elsevier's electronic delivery system also allowed subscribers to download individual articles from various journal issues, and thus provided scholars with another means of identifying the ways in which—and the extent to which—their work was being circulated and read, ensuring additional evidence for their tenure and promotion portfolios.

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[3] In this effort, we were inspired, in part, by three similar efforts: *Postmodern Culture*, first published online in 1990 and edited by John Unsworth and Eyal Amiran; *Kairos*: *A Journal of Rhetoric, Technology, and Pedagogy*, which published its first issue in 1996, edited by Mick Doherty, Elizabeth Pass, Michael Salvo, Jason Teaugue, Amy Hanson, Greg Siering, and Corey Wick; and, *Enculturation: An Electric Journal for Cultural Studies and Theory*, which published its first issue in 1997 under the editorial leadership of Byron Hawk and Thomas Rickert.

These new electronic environments, then, through various intensional networks, worked to accelerate the already-rapid spread of information and encouraged emerging disciplinary communities, such as computers and writing, to extend themselves over large distances (Brown & Duguid, 1996; Castells, 1997). Indeed, as John Brown and Paul Duguid pointed out, such communities are increasingly held together, at least in part, by digital networks that promote “documents circulating among members, keeping each other conscious of being a member and aware of what others are up to” (p. 4). There is every indication that this disciplinary networking, now occurring many years after Brown and Duguid’s historic article, continues to grow and expand as scholarship moves more and more into digital contexts.

Principle #3: Social networks and collaborative scholarship—especially when informed by feminist values on sharing and connection—can multiply and leverage the innovation and contributions of new scholarly projects. They can also help increase the sustainability of such projects and the community at large.

Although social networks have grounded the collaborative projects we have undertaken with the journal, various book series, and edited collections, feminist perspectives also continue to inform our scholarly work. Our most recent co-authored book, *Literate Lives in the Information Age* (2004), provides an important example of how feminist values on connection and an ethics of care (Noddings, 1984) can contribute meaningfully to collaborative scholarship and function to sustain the projects and disciplinary community from which they emerge. The goal for this book project was to gather information about literate practices as they occurred in peoples’ lives and, then, to analyze the information gathered within the larger contexts of the historical, political, economic, and ideological movements that had shaped these same people’s lives. We were—and continue to be—interested not only in how people acquire and develop digital literacies but also in how we can do justice to participants’ words while recounting their stories and, at the same time, holding ourselves accountable (Britzman, 2000). Following the lead of feminist scholars such as Caroline Brettell (1996), Patti Lather (2000), Deborah Britzman (2000), Shulamit Reinharz (1992), and Kamala Visweswaren (1994), we attempted to develop a research methodology that worked toward an ethical understanding of agency that honors all individuals involved in our study—a methodology that allowed us to write with and about those in our study in a manner that suits all parties.

With these concerns in mind, we invited participants to co-author their chapters with us to develop a feminist framework for doing such work and inviting truly collaborative processes between researchers and study participants. We were influenced in this decision by Caroline Brettell’s (1996) collection *When They Read What We Write*, which presents a series of perspectives on studies like ours—anthropological projects, ethnographies, and life histories—and talks about the ways in which approaches to such writing have suffered from the limited and often modernist perspectives of academics and professional scholars who, as Schoen (1983) noted, still cling to an understanding of “the superior academic value of ‘pure knowledge’ inherited from the ‘model of technical rationality’ that has been influential in all American social sciences” (p. 27). In many respects, we see this attitude as a part of the conservative forces that authors in disciplines outside the humanities encounter and, which, as we’ve noted, tends to challenge models of scholarship that privilege collaborative authorship. As we thought through our research practices, we came to the conclusion, however, that co-authorship—as a refinement in method—would give participants more say in the politics of interpretation. When we turned to the participants, finally, and asked if they would be willing to co-author their chapters, the great majority of those whom we approached accepted, only a few preferring to maintain their anonymity and privacy.

Although we began our project with the intent to sample a representative group of people within the United States, we inevitably came in contact with those in other parts of the world who had their own rich digital literacy stories to tell. Thus, what began as research focusing primarily on a network of participants from the United States quickly spun out into other projects that now include people from China, Taiwan, Nigeria, Egypt, Norway, and other countries (see Hawisher, Selfe, Guo, & Liu, 2006; Hawisher, Selfe, Coffield, & El-Wakil, 2006; Selfe, Hawisher, Lashore, & Song, 2006). This scholarship continues with recent presentations we have given at Australia's University of New South Wales and China's Peking University.In all this work, we have found that the more we engage in collaboration informed by feminist values between ourselves and among the many that contribute to the computers and writing community, the richer and more sustainable the scholarship becomes. These collaborative configurations tend to encourage, in addition, the circulation, exchange, and the social sharing of new knowledge in ways that exponentially increase the membership of disciplinary communities, encourage new collaborations among those who come together however briefly, and, ultimately, we hope, provide sustenance for a young, expanding field (Benkler, 2004; Johnson-Eilola, 1995).

These collaborative configurations are having a similar effect on another research project that grew out of our work with *Literate Lives in the Information Age* (2004). Recognizing that far too many literacy stories remained uncollected, unheard, and unappreciated, we began talking about the possibility of an archive to house the many digital literacy narratives that were yet to be told. When one of the authors moved to Ohio State University, the project began to take on a life of its own. Led by Cynthia Selfe, H. Lewis Ulman, and Richard Selfe, the Digital Archives of Literacy Narratives (DALN) project was designed to develop a searchable, public archive of literacy narratives—autobiographical recollections of how individuals acquired the ability to read and write; the conditions under which they did so; and what familial, educational, economic, technological, and historical influences have shaped their literate practices. Depending on the preferences of individual contributors, these literacy narratives may be written documents, video-taped recollections, or audio recordings. The DALN is available on the web, both for individuals to contribute their narratives and for scholars, educators, and literacy program workers to search and use, thus extending the reach of research possibilities.

To plan for the sustainability of the DALN, the Ohio State University team partnered with an established state-wide project—OhioLink's Digital Resource Commons, which is committed to maintaining electronic collections of information for educators across the State. This partnership leverages local efforts by taking advantage of an established technological infrastructure that will continue to support the DALN project in coming years. Most significantly, the project recognizes that although our continuing international research is important, today's new technologies allow—indeed demand—a much wider circulation of documents and other materials. In other words, DALN is responding to trends of informatization and globalization, and the ways these trends have converged in the 21st century to transform communication and literacy practices, which increasingly occur within and around globalized computer networks (Brandt 1995, 2001; Castells, 1996, 1997, 1998; Kress, 1999, 2003). Within this context, communicative practices and values have become increasingly international, cross-cultural, and digital; they have also, in many cases, become increasingly multimodal. In globalized computer environments, texts designed to carry meaning across geopolitical, linguistic, and cultural borders must take full advantage of not only words, but also of still images, video, animation, and audio (Selfe & Hawisher, 2004).

These changes in literacy practices and values are both dramatic in scope and far reaching in effect, and they pose enormous challenges for humanities scholars. The need to focus on new forms and practices of literacy and to provide an historical trace of literacy practices as they continue to migrate from print to digital environments, has become acute—for humanities scholars, librarians, historians, and educators among many others. Once fully implemented, the DALN will invite citizens of all ages, races, genders, and backgrounds to tell their literacy histories—using print, audio, or video—in response to a series of prompting questions and then to submit these narratives to a public, web-based archive, along with any literacy artifacts (e.g., poems, song lyrics, essays, photographs, video clips) that have a bearing on these stories. Because the archive's historical value will increase in direct proportion to the number of people who voluntarily contribute their literacy narratives, a series of DALN centers will be set up at various locations to encourage a broad range of citizens to tell their stories about literacy, and to describe the literacy values and practices of their families, their peer groups, and their communities. As the archives expand, we hope to fund additional projects aimed at targeting specific groups of citizens whose stories are under-represented. The DALN project can best be compared to the Mass Observation project in Britain, which has been in existence since 1937. The Mass Observation project, like the DALN, has the goal of tracing the everyday literacy practices of ordinary people that often remain invisible in our culture—especially during times of dynamic change (Sheridan, Street, & Bloome, 2000).

Finally, as we write this chapter, we have very much on our minds the most recent of our projects, Computers and Composition Digital Press (CCDP), which is designed to address more thoroughly those problems in publication we have enumerated. CCDP has in place an impressive international editorial board of scholars and, with the help of good colleagues from Miami University, the Illinois Institute of Technology, as well as the University of Illinois and Ohio State University, we have begun to solicit ebook proposals like *Technological Ecologies and Sustainability* in which this chapter appears. Recognizing the dilemma that junior faculty face in finding publication venues for their digital media scholarship, CCDP is committed to publishing innovative, peer-reviewed ebooks and multimodal scholarly projects in an open-access, online venue. We seek digital academic publishing projects that have the same gravity as books, but not always necessarily the specific form of books. That is, the press will publish print texts in electronic form available for downloading, but we are also particularly interested in digital projects that cannot be printed on paper, yet have the same intellectual heft as a book. Most recently, Utah State University Press (USUP) has signed on to host the imprint of CCDP. The collaboration between Michael Spooner, the Director of USUP, and ourselves marks an attempt to institutionalize CCDP for the future. Unsurprisingly, we have also teamed up with the Institute for the Future of the Book, a group “investigating the evolution of intellectual discourse as it shifts from printed pages to networked screens.” One of its major projects is developing the software *Sophie*, a media-rich program for everyday web authors that we hope will prove useful to CCDP authors.

The goal of the digital press is to honor the traditional academic values of rigorous peer review and intellectual excellence, but also to combine such work with a commitment to open access and innovative digital scholarship. For us, the digital press represents an important kind of scholarship and scholarly activism—an effort to circulate the best work of digital media scholars in a timely fashion and on a global scale made possible by digital distribution. We acknowledge that starting these projects has required an enormous amount of work and, even more important, that sustaining them remains the real challenge. To some extent, the long-term continuation of these projects will depend on luck and good timing, as such things always do. We hope that these factors will exert a relatively minor and manageable influence if we can focus on careful planning and the collective efforts of talented and committed people that make up our intensional networks.

The colleagues and graduate students with whom we have worked have made all the difference in providing the needed sustenance for the many projects in which we have been involved. Although we didn’t set out to participate in Brown and Duguid’s intensional networks, the extraordinary times in which we live, the technology-rich environments in which we work, and the generosity of colleagues in the expanding fields of literacy and technology studies have sustained us and the projects we have undertaken.

THINKING ABOUT THE FUTURE

Certainly, it will not be our own limited efforts and projects that shape the profession’s ongoing negotiation of stasis and change. As scholars, we work among a community of individuals, with similar and different experiences and commitments, who will continue to define their own balancing points within departmental, institutional, and professional contexts. And these contexts, in turn, will continue to respond to—and shape—emerging practices in digital communication environments. Indeed, the MLA Task Force (2007) report, citing David Damrosch (1995) among others, noted that emerging technologies are already demanding our attention, creativity, and intellectual flexibility. The increasingly common practice of distributing dissertations in electronic formats, for instance, has already de-stabilized the historical understanding of the dissertation as a “protobook” (p. 67), creating both exciting possibilities and worrisome problems for junior scholars in departments of English. Similarly, changing digital venues for collaborative knowledge construction, exchange, and distribution, as well as emergent forms of multimodal scholarship, have already affected our professional understanding of scholarship in fundamental ways—both exciting and challenging.

Our goal, however, will be to continue our scholarly efforts, informed by feminist values and undertaken in ways sustainable within the contexts of our own lived experiences as scholars. For us, this means that we will continue to respect the judgment and input of colleagues who, as mentioned, maintain values on scholarly projects characterized by excellence, intellectual reach, and peer review. At the same time, however, we are also determined to push for change—to push our departments, our institutions, and our profession to recognize new forms of excellent digital scholarship; to push our tenure and promotion committees to understand the work of scholars exploring new digitally inspired ways of making meaning; to push ourselves to explore ways of producing, exchanging, and distributing ideas in digitally supported systems.

We believe that this balancing act demands ethically rigorous and sustainable forms of professional discipline within English departments. In this work, it would be dangerous to indulge either in unthinking digital boosterism or to succumb to defensive intellectual conservativism. If, for instance, we think it important to retain our historically informed value on scholarship that is original and innovative, smart and sustained, peer reviewed and published, we must also take on the responsibility of acknowledging that scholarly fields and forms change; and we must consider carefully how traditional values can be applied to emerging scholarly projects as well as conventional ones. Similarly, if we think it important to codify scholarly production standards in tenure and production documents, we must also be open to revising such documents on a regular basis so that they allow for a more “capacious conception of scholarship” (MLA Task Force, 2007, p. 5) that better accommodates the work of junior scholars breaking productive new intellectual ground. We cannot allow ourselves to be content with guidelines just because they worked for us at the historical moment of our own tenure.

And if we are intent on retaining our conventional scholarly values, we must also remain intellectually active in our thinking. We must commit ourselves to avoiding ossification by being receptive to multiple new forms of knowledge production and new genres of scholarship—considering, among others, those forms that employ multiple semiotic channels to make and convey meaning, and collaborative systems of knowledge production that have proven generative and useful to scholars within digital environments. Making our way in this middle territory—by whatever tactics we adopt and strategies we negotiate (de Certeau, 1984)—will not be easy but may yield and sustain digital scholarly efforts, and, if we are lucky, valuable new forms of intellectual work.

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Afterword
Sustainable Writing Programs: A Continuing Agenda

Charles Moran

This is a book about the relationship of computers-and-writing programs to “place”: the institutions that house these programs, the stakeholders who together constitute these institutions, and the institutional and human motives that drive these stakeholders. In 1995, when Gail Hawisher, Cynthia Selfe, Paul LeBlanc, and I finished the manuscript of *Computers and the Teaching of Writing in American Higher Education, 1979–1994: A History*, we saw that another, parallel book needed to be written, a book organized around place. And here, after 12 years, it is. We chose chronology as the armature for our book. Chronology gave us the benefits of a narrative structure, and allowed us to tell a story of the general development and growth of our field from our collaborative, combined perspective. To expand and diversify this perspective—to make the story more collective, less idiosyncratic and individual—we brought in other narrators (Lillian Bridwell-Bowles, High Burns, Locke Carter, Eric Crump, Michael Day, Lisa Gerrard, Johndan Johnson-Eilola, Michael Joyce, Rebecca Rickly, Helen Schwartz, Patricia Sullivan, Myron Tuman, Pamela Takayoshi) So we had multiple narratives—better for truth-telling than a single narrative—but, still, fast-paced stories driven by the clock.

I’m proud of what we did. Yet we were forced, by our choice of a chronological narrative, to stay very much on the surface of things. Yes, program directors at all sites had to scramble for funds—but who, at a given institution, did the scrambling? With what tactics? Competing against what institutional and personal agendas? And with what failures, and what successes? This present book, *Technological Ecologies and Sustainabilit*y, with each chapter firmly located in a place (i.e., a particular institution of post-secondary education), looks at program development with the depth that we could not achieve in our chronological history. At the center of each chapter are institutional dynamics, personalities, motives, stakeholder-profiles—the gritty elements of a program’s struggle for the resources it needs to survive and, if it is smart and lucky, grow.

The chapters in this book give us situated models of programs that have been able to sustain themselves over time. Implicitly or explicitly, they give us advice about how one needs to go about building a sustainable computers-and-writing program.

I wish that we had had these models, and this advice, when colleagues and I at the University of Massachusetts, Amherst, launched our first computer-equipped classrooms in 1984—first with IBM PC’s on loan from IBM; then with Digital’s gift of 55 obsolescent DecMates, then Novell-networked Leading Edge PC clones—each workstation equipped with its own Epson dot-matrix printer. Who among us now remembers the incredible buzzing of 24 dot-matrix printers running simultaneously at the end of class? Loud, clumsy printers; hand-me-down computers; and reliance on gifts of obsolete technologies from companies was intolerable and certainly unsustainable. Marcia Curtis and I put in hours—if not days—learning to make our local area network one that would support our primary purpose: sharing texts. We were forced to create hundreds of batch files that let us work around the document security that Novell assumed we’d need. Very exciting, but not, long-term, a sustainable level of effort and commitment. Yet our computer classrooms, and our integration of computers into our writing curriculum, have continued into the present. Somehow we survived, and even prospered a bit. The chapters in this book make me think about the choices we made, some good, some less so. They also make me think about the choices that we will be making in the future as we attempt to sustain our program and, as possible, foster its growth.

* * * *

If we had known then what we know now, however, we might not have begun at all. The book reminds me of our struggles to find space and funding for our computer-equipped writing classrooms in a university system already strapped for space and money. We found grants that paid for the computers, but who would pay to air-condition the rooms themselves? Who would pay to replace a machine when it went down? Who would perform or pay for maintenance? Depreciation? Paper for the printers? Lab monitors or consultants for the computer classrooms during open hours at night? These were all expenses new to our English Department, a department that had functioned well for some 50 years without an equipment line in its budget. Given the struggles depicted in some of the chapters in this book, apparently this problem continues to plague writing programs, particularly those housed in English departments.

Yet the chapters in the book remind me as well of the excitement and enthusiasm generated by our new facilities. As program director feeling responsible for the facility, on a dark winter night in 1986 I drove to campus to see what these classrooms looked like after hours. In the first room I visited some student writers were in clusters, looking at one another's screens; others were working solo. The student lab monitor's boom-box was playing softly. Someone had ordered in pizza. The monitor, a poet with an MFA, was conferring with a student about her poem. This was another world—a writing place, in violation of the no-food-and-drink rules of our computer center (to say nothing about the boom-box)—a room filled with writers plying their craft, in a positive, home-like atmosphere. For the first time on our campus, we had a real writing place, a set of rooms dedicated to the activity of writing.

* * * *

Just as this book fills a gap left by our 1996 history of the field, it leaves its own gaps to be filled by the next generation of scholars. In the section that follows, I describe three areas that, in my view, need to be explored if our writing programs, our institutions, and spaceship earth itself are to survive. In doing this I am explicitly encouraging young scholars in our field to begin thinking along one or more of these three lines as they shape their research and prepare conference presentations and submit publications into the near-term future. I see each of these three areas as equally important. Given my choice to write this Foreword in linear form, I have to begin with one of these areas. But the sequence here is not of increasing or decreasing importance; it is how the areas came to be written.

To begin: If we are to sustain our programs, we need to focus on the assessment of the learning that takes place, in, around, and because of our computer-equipped facilities. Our institutions and our students have all spent a lot of money on the computing facilities available on our campuses, and in particular on the computer components of our writing programs. Would this money, if spent on live instructors and face-to-face instruction, produce more learning? Less learning? Different learning? We do not know. There is very little talk about assessment in the chapters of this book, and for good reason: There has been very little done in this area. If we want to have sustainable computers-and-writing programs, we have to be able to say, with some credibility, that the dollars we spend—and those that our students spend through equipment purchase, tuition, and fees—are dollars well spent, and that there is an outcome that is worth the investment. In the 1980s and 1990s we believed that computers, especially word-processor machines, improved student writing, but despite our best efforts, we could never credibly support that argument. Now, in what may be the waning days of our national assessment frenzy, we need to think seriously about assessing the learning that we can legitimately attribute to our expensive machines. If our argument is that today's students, writing and composing online, are learning differently—not to write better five-paragraph themes, but to compose flexibly in multiple media—then we need to try to measure this new learning and to establish its value, in terms of personal growth, earning power, ability to collaborate, or some other outcome. This book begins to describe the new learning and to devise instruments that will assess it. It is hard to imagine a sustainable program of teaching and learning that does not seriously attempt to assess student learning.

A second need is research and scholarship that helps us determine "good" and "bad" uses of technology, given particular goals for our students' learning. I'm thinking of the push by ETS and others to sell our institutions the services of machines that will 'read' and score our students' writing. These programs, and the marketing muscle that lies behind them, are well-described in the chapters of Patricia Freitag Ericsson and Richard Haswell's (2006) *Machine Scoring of Student Essays*. How are writing program directors coping with the threat of these programs, which, on the surface, seem to offer cheap and objective ways of assessing and responding to student writing? These machine-scoring programs give entirely bewildering and often dead-wrong advice and feedback to writers, advice that is not only confusing and inaccurate in its own right but that generates conflict with any feedback given by teachers. As things now stand, a writing teacher, K–college, can be forced to use an administratively mandated service that will give automated feedback to student writers. How are writing programs now dealing with these seductively packaged and powerfully marketed systems? If our writing programs are to be sustainable, and if our uses of technology within those programs are to be sustainable, we have to define and sort out the beneficial and harmful uses of technology, and argue hard for the uses that we believe serve our goals for teaching and student learning. As Anne Herrington and I have argued elsewhere (2001), and as the CCCC Position Statement on Teaching, Learning, and Assessing Writing in Digital Environments (2004) asserts, writing to a machine is not the same act as writing to an audience of human beings. Writing, even journal writing, is ineluctably social. People write to other people for human and social purposes. The machine scoring of writing turns the act of writing into a game, one in which you learn to "trick" the machine to improve your score. How can we, as experts in our field, resist the incursion of these harmful uses of technology into our writing programs? We need careful analyses of the use outcomes of these machine-scoring programs and, assuming that we do not approve of these outcomes, strategies for keeping them at bay in our home institutions.

A third need is suggested by the word *sustainable* in the title of this book. In this present anthology, the chapter authors describe what teachers, students, administrators, scholars, editors, programs, departments, writing centers, and research centers have done and might do to sustain themselves, but with the notable exception of Shawn and Kristi Apostel's chapter, there is little discussion of what we do as sustainable in world terms. According to Tim Pawlenty, chair of the National Governors Association, "the average desktop PC currently wastes half of the power it receives." Pawlenty and his association argue that state offices could and should reduce their energy expenditures on information technologies by half (U.S. Department of Energy, 2007). By extension, writing programs should do the same. When in 1985 we opened our first computer-equipped writing classrooms at my university, we had to have air conditioning installed in the rooms to cope with the heat generated by the computers. The air conditioners are still there, and the computers, too—newer, much more powerful, consuming more power, generating more heat that needs to be cooled with still more power. Not, in world terms, a sustainable practice.

A globally sustainable writing program would begin by installing energy-efficient computers and perhaps moving to laptop classrooms, because laptops use less power than desktops. It would lobby its home institution to follow Stanford University's lead and establish a Sustainable IT Working Group to do an energy use analysis of all IT services and make recommendations for changes in equipment, software, and user-behavior that would reduce energy consumption—and, at least in Stanford's situation—potentially save $400,000 a year

(Dedrick, 2008). But a sustainable writing program would need to go much further than this—and here's where things get interesting. We tend to assume—or at least I and my friends, acquaintances, and colleagues do—that the online world is somehow "free." But it is not. Online banking, for example, uses and transports much less paper than check-based banking did. So one could argue that there have been energy savings in the use and transport of paper. Yet banks need to operate or lease the tremendous server capacity required by their online systems. Servers, just like our desktops, use, in the aggregate, huge amounts of energy, some of which generates waste heat, which then has to be removed by some form of cooling, usually air conditioners powered by electricity. So every online transaction costs our environment something. And so does every online search, whether for the best deal on a pair of socks or information that I need if I am to write this Foreword. As I have worked toward the completion of this essay I have done dozens of Google searches. An amazing capability, really; I've found sources that I'd never been able to find in our paper library, however beautifully indexed. As I was searching, I found a *Business Week* article by Manfred Dworschak (2008), titled "Server Farms as Polluting as Air Traffic." In this article, the author estimates that a single Google search consumes enough electricity to light an 11-watt fluorescent bulb for an hour. By that calculation, in searching the Internet for the purposes of this Foreword, I have used at least 200 watt-hours, which, the power meter on my bicycle tells me, would take me over an hour to generate, pushing as hard as I can.

To make our online searches possible, Google operates and leases vast server farms located throughout the world. The server farms generate waste heat that then needs to be "cooled," or, rather, removed from the computers and added to our already warming world. Google is now building a new server farm—with four-story cooling towers—in Oregon close to the Bonneville Dam, so that it can get all the power it needs and (smart move) claim that its tremendous energy drain comes substantially from renewable resources (i.e., Bonneville's water power). Some of the waste heat will be vented into the atmosphere via the cooling towers and the remainder returned to the Columbia River, warming the lower reaches of the river and further altering its ecology. Dworschak writes that these

> numbers reveal that the sheer, disembodied lightness of the data world is nothing but a pretty illusion. In fact, it is a world built on real world data processing factories that, when it comes to power consumption, are reminiscent of the early days of industrialization. Computing with electrons is just as physical as the melting of steel or rolling of sheet metal. In both cases, no one cared much about resource consumption during the early phases. (p. 2)

That's brutal. How shall writing programs respond? Are there ways in which we can help our students understand the costs, as well as the benefits, of their online research? Paper libraries have an environmental cost as well, a cost that we did not consider when we assigned documented essays and sent our first-year students off on their library tours. But online searches take so much less effort and personal investment: no walk to the building, perhaps late at night; no library card; no uncomfortable chairs and poor lighting. And one can search so easily and quickly for anything—friends and clothing as well as information needed for a project. There seems to be no cost, no limit, but there is. There's an agenda for a third line of research: the costs and benefits of computer technologies insofar as they apply to our work as teachers of digital writing, and a writing program's appropriate response.

* * * *

In this Foreword, inspired by the anthology you are about to read, I have raised three questions that present challenges for all of us in the field of computers and writing:

1. How shall our computers-and-writing programs assess student learning?
2. How shall we defend ourselves against what we feel are improper uses of technology in our work?
3. How shall we cope, personally and institutionally, with the environmental costs of this technology which we love so well?

These questions, and our approaches to answers to these questions, must be part of the research agenda for the next generation of teachers and scholars in our field.

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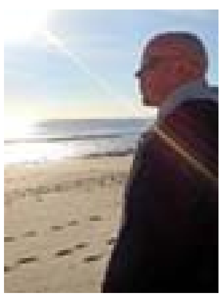
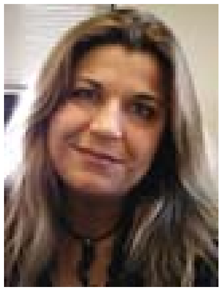
Kristi Apostel is an online writing tutor for Smarthinking, Inc. A former executive director for an environmentally based non-profit, Kristi received her MA in English from Clemson University. She recently completed the Instructor's Manual for *The DK Handbook* and has taught as an English and writing instructor at several colleges and universities in both Georgia and Michigan. Kristi has previously collaborated with Shawn on teaching digital portfolio classes and presenting writing across the curriculum research.

Shawn Apostel is a PhD candidate at Michigan Technological University; he works at the local City Hall to enhance and promote the historic downtown in which their Depression-era home is located in Houghton, Michigan. Shawn received his MA in Professional Communication from Clemson University, where he served as a research assistant for Art Young. He teaches multimodal composition, graphic design, and publication management. Shawn has previously collaborated with Kristi on teaching digital portfolio classes and presenting writing across the curriculum research.

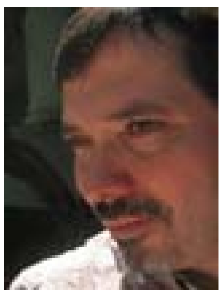


Anthony T. Atkins is an assistant professor at the University of North Carolina at Wilmington where he currently serves as the composition coordinator. He teaches courses and conducts research in professional communication, writing and technology, document design, video and composing, composition theory, and rhetorical theory. He serves on the editorial board for *Kairos: A Journal of Rhetoric, Technology, and Pedagogy* and serves on the executive board for the Carolina affiliate of Writing Program Administrators (WPA).

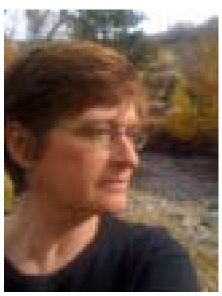
Cheryl Ball teaches and studies new media reading, composing, and evaluation strategies, especially as they relate to digital scholarship. She has a PhD in Rhetoric and Technical Communication from Michigan Tech and an MFA in Poetry from Virginia Commonwealth University. Ball has published in *Computers and Composition*, *Composition Studies*, *Convergence*, *Fibreculture*, and *Computers and Composition Online*. She is editor of *Kairos: A Journal of Rhetoric, Technology, and Pedagogy*. Her online portfolio can be found at http://www.ceball.com.



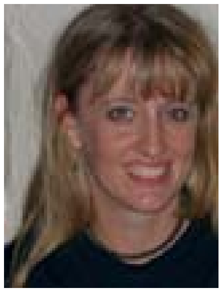
Kristine Blair is professor and chair of the Department of English at Bowling Green State University, where she has taught undergraduate courses in classroom technologies and language arts, and fully online writing courses for adult learners. Blair has also taught doctoral-level courses in computer-mediated writing theory, research methodologies, and online pedagogies. The author of numerous publications on gender and technology, electronic portfolios, the politics of online communication, and cultural studies pedagogies, she currently serves as editor of the journal *Computers and Composition Online*. In 2007, Blair received the Technology Innovator Award from the Conference on College Composition and Communication's Committee on Computers and Composition. Her most recent project is the co-edited *Webbing Cyberfeminist Practice: Communities, Pedagogies, and Social Action* (Hampton Press, 2008), and she currently directs a computer camp for girls in grades 6–8 titled “The Digital Mirror.”



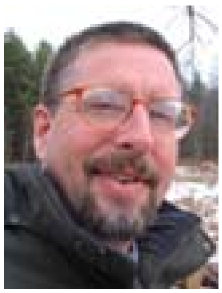
Patrick W. Berry is a PhD candidate in the Center for Writing Studies and Department of English at the University of Illinois at Urbana-Champaign. His research concentrates on English teachers' literacy narratives as a family of genres to explore the intersections among literacy, personal experience, technology, and social class. His “Critical Remediation: Locating Eliza” appeared in *Kairos: A Journal of Rhetoric, Technology, and Pedagogy* in 2007.



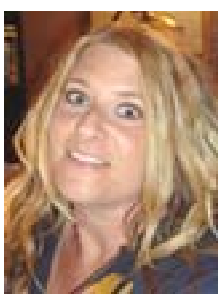
Kelli Cargile Cook is an associate professor in the professional and technical writing program at Utah State University. Her research focuses on technical communication pedagogy, online writing pedagogy, Web-based training, and technical communication program development and assessment. She co-edited *Online Education: Global Questions, Local Answers*, which received NCTE Award for Excellence for Best Collection in Technical and Scientific Communication in 2006. Cook has recently authored a Web-based training program, *Hiring with Excellence*, as part of an NSF ADVANCE grant, and has revised the third edition of *The Elements of Technical Writing*. She has directed both the undergraduate and doctoral programs in professional and technical communication at Utah State. Cook served as the president of the Council for Programs in Technical and Scientific Communication from 2006–2008 and is currently serving as vice president of the Association of Teachers of Technical Writing.



Beth Brunk-Chavez is an assistant professor in the Rhetoric and Writing Studies program and the director of First-Year Composition at the University of Texas at El Paso. Her research is focused on the areas of teaching with technology, writing and technology, and composition pedagogy. With Shawn Miller, her co-author, she has also published in *Kairos: A Journal of Rhetoric, Technology, and Pedagogy*. Additionally, her work has appeared in *WPA: Writing Program Administrator, Teaching English in the Two-Year College,* and other journals. She is co-authoring a composition textbook, *Explorations*: *A Guided Inquiry into Writing*, with UTEP colleague Helen Foster.



Michael Day is an associate professor of English at Northern Illinois University, where he teaches rhetoric, composition, technical writing, and writing for electronic media. Co-founder of the Great Plains Alliance for Computers and Writing and host of the 1999 Computers and Writing Conference, he has presented and published on topics ranging from intercultural rhetoric to Internet communication and online teaching. With Susanmarie Harrington and Rebecca Rickly, he is co-editor of *The Online Writing Classroom* (Hampton Press, 2000), and with Carol Lipson he is co-editor of *Technical Communication and the World Wide Web* (Lawrence Erlbaum Associates, 2005). Day directed the First-Year Composition Program at NIU from 2002 to 2008, and is a past chair of both the Conference on College Composition and Communication (CCCC) Committee on Computers in Composition and Communication and the National Council of Teachers of English Assembly on Computers in English. In 2006, Day was awarded the Charles Moran Award for Distinguished Contributions to the Field by Computers and Composition. In 2007, Day was elected to the CCCC Executive Committee. Day's site is available at http://www.mday.org



Dànielle Nicole DeVoss is an associate professor and director of the Professional Writing Program at Michigan State University. Her research interests include computer/technological literacies; feminist interpretations of and interventions in computer technologies; and intellectual property issues in digital space. DeVoss' work has most recently appeared in *Computers and Composition*; *Computers and Composition Online*; and *Kairos: A Journal of Rhetoric, Technology, and Pedagogy*. DeVoss recently co-edited (with Heidi McKee) *Digital Writing Research: Technologies, Methodologies, and Ethical Issues* (2007, Hampton Press), which won the 2007 Computers and Composition Distinguished Book Award. She is currently working on a National Writing Project book with Troy Hicks, titled *Because Digital Writing Matters* (Jossey-Bass), and an edited collection with Martine Courant Rife and Shaun Slattery, titled *Copy(write): Intellectual Property in the Composition Classroom.*

Lisa Dush is a lecturer in the Writing Across the Curriculum program at the Massachusetts Institute of Technology. At MIT, Dush teaches writing and oral communication in the departments of chemical engineering, biological engineering, and mechanical engineering. She is also the director of Storybuilders (http://www.storybuilders.org/), a business that helps individuals and organizations tell stories with digital media. Through Storybuilders, Dush has worked with public health professionals, youth, and nonprofit organizations, teaching staff and clients to produce digital stories and use these stories for outreach, promotion, and education. Dush recently completed her dissertation on the implementation of digital storytelling in organizations. Her research interests include sociocultural theories that can clarify technology implementation, technology across the disciplines, and the impact that everyday and prosumer technologies have on work and individual creative practice.

Jude Edminster is an associate professor in the Scientific and Technical Writing Program of the English Department at Bowling Green State University and coordinator of the program's Online Graduate Certificate in International Scientific and Technical Communication. Edminster has published articles and book chapters in *Computers and Composition*, *Technology in English Studies: Innovative Professional Paths* (Inman & Hewett, Eds., Lawrence Erlbaum Associates, 2005) and *Composing and Revising the Professional / Technical Writing Program* (Franke & Reid, Eds. Parlour Press, forthcoming). Her work in progress includes qualitative field research on the evolving genres of digital geology field notebooks (GeoPads), electronic multimedia dissertations (ETDs), and most recently, government-mandated electronic medical records (EMR). More about Edminster's work can be viewed at http://personal.bgsu.edu/~jedmins.

Patricia Freitag Ericsson is an assistant professor at Washington State University where she coordinates the Digital Technology and Culture program and teaches undergraduate and graduate courses in digital technology and culture and rhetoric and technical communication. Her research interests include techno-rhetoric, technical writing, and the intersections of technology, education, and agency theory. Ericsson's current research concerns digital communication technologies and transnational families. Her work has appeared in *Computers and Composition*; *Kairos: A Journal of Rhetoric, Technology, and Pedagogy*; *English Education*; *Journal of Teaching Writing*, and several edited collections. She is the co-editor of *Machine Scoring of Student Essays: Truth and Consequences* (Utah State University Press, 2006).

Peter J. Fadde is an assistant professor of Instructional Technology and Instructional Design in the College of Education and Human Services at Southern Illinois University. He teaches courses in instructional Internet applications, interactive multimedia, learning theory for instruction, instructional simulations and games, eLearning, and video production. Fadde's research interests center on training of expertise and expert performance, sustainable educational technology approaches, and the re-emergence of video in Web-based corporate communications and training. Fadde is co-coordinator (with Sebastian Loh) of the Collaboratory for Interactive Learning Research at SIU. Fadde is married to Patricia Sullivan; Peter and Pat are pictured with their children Jae and Elizabeth.

Kristie S. Fleckenstein is associate professor of English at Florida State University where she teaches rhetoric and composition classes in the undergraduate and graduate programs. She is the author of *Visualizing Change: Vision, Rhetoric, and Social Action in the Composition Classroom* (Southern Illinois University Press, 2009) and *Embodied Literacies* (Southern Illinois University Press/National Council of Teachers of English, 2003), which received the 2005 Conference on College Composition and Communication Outstanding Book of the Year Award. She has also co-edited two collections on imagery, rhetoric, and teaching. Her work has appeared in *College English*, *College Composition and Communication, JAC*, *Rhetoric Review*, *Computers and Composition*, and other journals. Currently, she is researching the linkages between nineteenth-century photography—the oldest of the new media— and the rise of current traditional rhetoric.

Gail E. Hawisher is professor of English and founding director of the Center for Writing Studies at the University of Illinois at Urbana-Champaign. She is widely published in digital media and literacy studies, and, co-edits, with Cynthia Selfe, the international journal *Computers and Composition*. Hawisher's publications include *Global Literacies and the World Wide Web* (Routledge, 2000) and *Passions, Pedagogies, and 21st Century Technologies* (Utah State University Press, 1999), which won the 2000 Distinguished Book Award at Computers and Writing. She and co-author, Cynthia Selfe, have also published the book-length study *Literate Lives in the Information Age* (Erlbaum, 2004), which uses life history interviews to look at how people of different generations have come to digital literacies, and, most recently, the coedited *Gaming Lives in the 21st Century: Literate Connections* (Palgrave, 2007). Current projects that she and Selfe are working on include *Transnational Literate Lives*, a multimodal book-length study that relies on video as a research, authoring, and presentation tool. In the past several years, Hawisher has been honored to receive from her department the Robert Schneider Award for Outstanding Teaching and Service (2000). Her university has also recognized her work with the Lynn M. Martin Award for Distinguished Women Faculty (2004), the Campuswide Award for Excellence in Undergraduate Teaching (2004), and the University Distinguished Teacher/Scholar Award (2005).

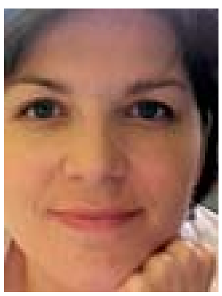
Fred Johnson teaches courses in writing, film, new media, and American literature at Whitworth University. His research and writing explore social-networking theories, particularly focusing on literary representations of social networks, innovation in social networks, and research as a social-networking task.

Kate Kiefer is a professor of English at Colorado State University where she teaches undergraduate composition and graduate composition theory courses. She developed her long-standing interest and expertise in computers and writing in the early 1980s when she co-founded *Computers and Composition*, of which she is still emeritus editor. She continues to research teaching in both physical and virtual computer contexts, but her most recent work has focused on studying the ways in which reading, writing, and thinking can be considered complex adaptive systems.

Lisa Lebduska is an associate professor of English at Wheaton College, where she directs the college writing program and teaches a variety of writing courses. Her work has appeared in *Environmental Politics*, *ISLE*, *Writing on the Edge*, the *Writing Lab Newsletter*, and *Composition Studies*. “The Body Matters of Digitized Contexts”—Lebduska’s chapter examining the material challenges posed by online environments—will be included in Hampton Press’s forthcoming *Teaching Writing in the Twenty-First Century*, edited by Joanna Castner and James Inman.

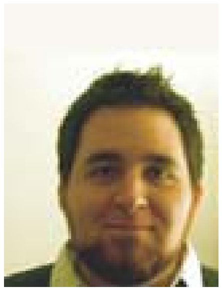
Andrew Mara is an assistant professor at North Dakota State University, where he teaches technical and professional writing, rhetoric, and nineteenth-century American literature. Mara’s research and teaching centers upon a concern with institutional innovation and investigates the convergence of writing practices, institutional design, and community. He has contributed articles to *Technical Communication Quarterly*, the *Journal of Business and Technical Communication*, *IEEE Transactions in Professional Communication*, and *Academe*, as well as several essays for collections. He is currently editing a special issue on posthuman rhetorics and technical communication for *Technical Communication Quarterly* and is working on a book-length manuscript on posthuman desire and rhetorical invention. In an earlier life, he was a technical communicator at Sandia National Laboratories.

Heidi A. McKee is an assistant professor in the Department of English and an affiliate faculty member of the Armstrong Center for Interactive Media Studies at Miami University. Her teaching and research interests include digital literacies, multimodal and digital rhetorics, qualitative research methodologies, and ethical research practices. McKee serves on Miami's human subjects institutional review board, and the ethics committee for the Association of Internet Researchers. With Seth Kahn, she co-chairs the Qualitative Research Network, which meets each year at the Conference on College Composition and Communication. McKee also served for two years as the co-founder and coordinator of Miami's Digital Writing Collaborative. Her work has appeared in numerous journals, including *College Composition and Communication*, *Computers and Composition, Pedagogy*, and *The Community Literacy Journal*. With Dànielle Nicole DeVoss, she co-edited *Digital Writing Research: Technologies, Methodologies, and Ethical Issues* (winner of the Computers and Composition Distinguished Book Award for best book in the field in 2007). With James Porter, she is writing a book-length manuscript titled *The Ethics of Internet Research: A Rhetorical Case-Based Approach* (Peter Lang, 2009).

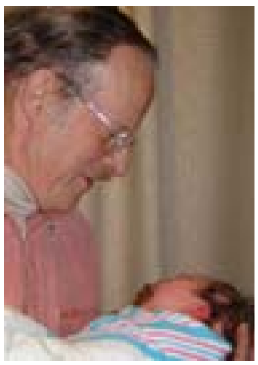


Jackie Grutsch McKinney teaches undergraduate and graduate courses in rhetoric and composition at Ball State University, where she has served as Writing Center Director since 2003. She has publications in *The Writing Center Journal*, *WPA*, *The Journal of Teaching Writing*, and several edited collections. In her current research, she tries to imagine how writing centers will need to evolve to meet 21st-century challenges and to support 21st-century student writers.

Ryan M. (Rylish) Moeller is an assistant professor in the Department of English at Utah State University. He teaches courses in professional writing, rhetorical theory, and the rhetorics of technology. Moeller's research focuses on the effects of technical discourse on human agency, especially within the consumer electronics industry. His work has appeared in *Technical Communication Quarterly*; *Kairos: A Journal of Rhetoric, Technology, and Pedagogy*; *Fibreculture*; *Computers and Composition Online*; *Works and Days*; and in edited collections. He is currently working on a book manuscript that examines the rhetoric of play in professional, consumer-oriented discourse.



Shawn Miller is an academic technology consultant for Duke's Center for Instructional Technology. Miller works with social science faculty on a variety of projects and grants, including strategies for working with flexible learning spaces, the use of data visualization tools, and technologies that improve group collaboration and knowledge sharing. Prior to his current position at Duke, Miller was manager of media production for the University of Texas at El Paso, where he worked with faculty on the design and implementation of hybrid and online courses and managed the development of multimedia projects to support teaching, grant-related activities, and community outreach programs. Miller has published, with Beth Brunk-Chavez, in *Kairos: A Journal of Rhetoric, Technology, and Pedagogy*.



Charles Moran is emeritus professor of English at the University of Massachusetts–Amherst. With Gail Hawisher, Paul LeBlanc, and Cynthia Selfe, he co-authored *Computers and the Teaching of Writing in American Higher Education, 1979–1994* (Ablex, 1995). With Anne Herrington, he co-edited *Genre Across the Curriculum* (Utah State University Press, 2005) and *Writing, Teaching, and Learning Across the Disciplines* (Modern Language Association, 1991). With Anne Herrington and Kevin Hodgson he has co-edited *The New Writing: Technology, Change, and Assessment* (Teachers College Press, forthcoming). He was the founding director of his university's Writing Program, and, with Pat Hunter and June Kuzmeskus, one of the founding directors of the Western Massachusetts Writing Project. Moran is pictured holding one of his grandchildren.

Mike Palmquist is professor of English, Associate Vice Provost for Learning and Teaching, and University Distinguished Teaching Scholar at Colorado State University, where he directs the University's Institute for Learning and Teaching. His scholarly interests include writing across the curriculum, the effects of computer and network technologies on writing instruction, and new approaches to scholarly publishing. His work has appeared in scholarly journals, edited collections, and books (including *Transitions: Teaching Writing in Computer-Supported and Traditional Classrooms,* which was written with Kate Keifer, Jake Hartvigsen, and Barb Godlew). With Jill Salahub and a host of WAC colleagues, he coordinates the development of Writing@CSU (http://writing.colostate.edu/)and the WAC Clearinghouse (http://wac.colostate.edu/).

James E. Porter is a professor in the Department of Writing, Rhetoric, and American Cultures at Michigan State University, where he has served as director of the graduate program and as co-director of the WIDE Research Center. Porter's research focuses on digital writing and rhetoric, particularly issues of audience, ethics, invention, methodology, and delivery. He is completing a book titled The Ethics of Internet Research (co-authored with Heidi McKee). Effective in Fall 2009, he will be a Professor of English and Interactive Media Studies at Miami University.

Colleen Reilly is an associate professor of English at the University of North Carolina at Wilmington. Her teaching and research focus on professional writing theory and pedagogy; electronic composition and citation; computer gaming and literacy; and gender, sexuality, and technology. Her publications include several chapters in edited collections related to writing and technology and digital research practices and articles in *Computers and Composition* and *Innovate.*

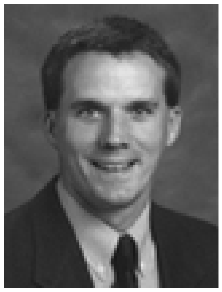
Jill Salahub is the editor and programmer for Writing@CSU (http://writing.colostate.edu/). She also teaches an upper-division composition class focused on writing for the Web. Her research interests include computers and composition, the use of technology and hypertext/hypermedia in the classroom, professional development for teachers, creative nonfiction writing, and writing for the Web. She received an MA in Communication Development from Colorado State University in 2003, having been granted distinction for her thesis, a hypertext entitled "Fear, Happiness and the American Way: The Difficulty of a Simple Life." Her other Web writing projects are teaching and writing guides for CSU's Online Writing Center, Web-based textbook supplements for multiple publishing companies, and Web sites for various writing across the curriculum projects at CSU. Most recently, she's been focusing her efforts on providing professional development opportunities for teachers using such technologies as the Writing Studio to enhance and extend the environment of their writing classes.

Cynthia L. Selfe is Humanities Distinguished Professor in the Department of English at Ohio State University, and the co-editor, with Gail Hawisher, of *Computers and Composition: An International Journal*. In 1996, Selfe was recognized as an EDUCOM award winner for innovative computer use in higher education—the first woman and the first English teacher ever to receive this award. In 2000, Selfe, along with long-time collaborator Gail Hawisher, was presented with the Outstanding Technology Innovator award by the CCCC Committee on Computers. Selfe has served as the chair of the Conference on College Composition and Communication and the chair of the College Section of the National Council of Teachers of English.

Richard (Dickie) Selfe, after 20 years of consulting across the humanities on communication technology projects and support systems, now directs the Center for the Study and Teaching of Writing (CSTW) at Ohio State University. The CSTW conducts research and provides services on writing in 21st century contexts through the Writing Center, WAC & Outreach programs, a Professional Writing Minor, and the Student Technology Consultant program. Selfe's academic interests lie at the intersection of communication pedagogies, programmatic curricula, and the social and institutional influences of digital systems. His most recent book-length project is *Technological Ecologies and Sustainability* (Computers and Composition Digital Press, forthcoming). Selfe's recent publications include *Sustainable Communication Practices: Creating a Culture of Support for Technology-rich Education* (Hampton Press, 2005); "Anticipating the Momentum of Cyborg Communicative Events" (forthcoming); "'Convince me!' Valuing Multimodal Literacies and Composing Public Service Announcements" in *English Studies*; and the "University Experience as Intellectual Property: Commodification and the Spellings Report" in *Computers and Composition Online*.

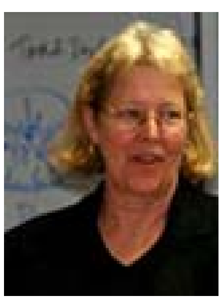
Jay Sloan is an assistant professor of English and director of the Writing Center at Kent State University's Stark campus. His work with writing center theory and practice began in graduate school, and he has published on writing centers in *Dialogue: A Journal for Writing Specialists*, *Praxis*, and *The Writing Lab Newsletter*. His research interests include educational technologies, tutor training, and issues of cultural difference and oppression in the writing center. At Kent State, he is the co-founder and current moderator of a multi-campus committee designed to further writing center development on all eight KSU campuses. He served on the Executive Board of the East Central Writing Centers Association, and is a co-founder of the Northeast Ohio Writing Centers Association.

Jeanne R. Smith teaches in the Writing Program and is the director of the Writing Center at Kent State University. She has taught rhetoric and composition in traditional classrooms, computerized classrooms, distance and distributed education settings, and hybrid-blended technology environments. Her research interests include first-year student experiences, inquiry-based learning, rhetorical invention and revision strategies, interdisciplinary collaboration, technology in composition pedagogy, tutor training, and faculty professional development. She is a co-founder of the Northeast Ohio Writing Centers Association and Vice President of the East Central Writing Centers Association.



Kip Strasma is an associate professor in the Writing Program at Nova Southeastern University; he has also taught writing, English, humanities, literature, and philosophy courses at Illinois Central College, the University of Miami, and Florida International University. Strasma's publications include an edited collection of scholarship on hypertext and writing theory, *Context, Intertext, and Hypertext,* with Scott DeWitt (Hampton Press, 1999); and he has published articles and reviews in *Computers and Composition, Teaching English in the Two-Year College, The Writing Instructor*, and *Eureka Studies in Short Fiction.* A current member of the Executive Council for College Composition and Communication, Strasma also serves as publications review editor for *Teaching English in the Two-Year College*.

Patricia Sullivan is a professor of English at Purdue University, where she directs the graduate program in rhetoric and composition and previously directed the program in technical writing. She teaches public rhetoric, research methodology, professional writing theory, computers and writing, and history of rhetoric. Sullivan was instrumental in starting Purdue's Professional Writing major and in crafting specialized areas of doctoral study at Purdue (Public Rhetoric; Rhetoric, Technology, and Digital Writing; Technical and Professional Writing). Sullivan's scholarly interests include gender and digital communication; the interplay of learned and public communication; disciplinary and institutional history/historiography; method, methodology, and notions of an academic field. Sullivan has published *Electronic Literacies in the Workplace* (with Jennie Dautermann, National Council of Teachers of English, 1996); *Opening Spaces: Writing Technologies and Critical Research Practices* (with James Porter, Ablex, 1997); *Professional Writing Online* (with James Porter and Johndan Johnson-Eilola, AB Longman, 2001, 2004, and 2008); and *Labor, Writing Technologies, and the Shaping of Composition in the Academy* (Pamela Takayoshi, Hampton Press, 2007). Sullivan is pictured with her husband Peter Fadde and their two children.



Kathleen Blake Yancey is Kellogg W. Hunt Professor of English at Florida State University, where she directs the Graduate Program in Rhetoric and Composition. As President of the National Council of Teachers of English, she has focused attention on 21st century literacies and on the role of writing in multiple sites across the country. A Past Chair of the Conference on College Composition and Communication and a Past President of the Council of Writing Program Administrators, Yancey also co-founded and co-directs the International Coalition on Electronic Portfolio Research (http://www.ncepr.org). Yancey's research focuses on composition studies generally; on writing assessment, especially print and electronic portfolios; and on the intersections of culture, literacy and technologies. She has authored, edited, or co-edited ten scholarly books and two textbooks as well as over 65 articles and book chapters; several of those volumes have focused on portfolios, writing assessment, and reflection. Yancey's current projects include *Composition in a New Key* (forthcoming).