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Computers and Composition 20/20: A Conversation Piece, or What Some Very Smart People Have to Say about the Future

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Abstract

At the 2011 Computers and Writing Conference, Town Hall speakers were asked to envision the future. This piece extends that conversation, with contributors presenting a range of ideas, often looking backward at our history before gazing into their crystal balls to envision what the future might bring. The pieces included here discuss writing, teaching writing, writing assessment, publishing, robotics, mobility, and other aspects of the field loosely termed computers and composition as it was, is, or may come to be in what we hope will be only the start of an ongoing conversation.

Keywords: Writing, teaching writing, writing assessment, publishing, robots, mobility, literacy, Web 3.0

Many readers of this issue attended the annual Computers and Writing Conference in May 2011 in Ann Arbor, Michigan. The various speakers at the Town Halls at the conference began by looking backward at our history and ended by looking toward the future, toward what might be. As part of this special issue, Randall and I invited several people to get out their crystal balls and envision the future.

What we received in response to this request was an embarrassment of riches, running the gamut from well-thought-out arguments to poetic crystal ball gazing, and everything in between. We decided to include these

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pieces with very little editorializing. Due to space constrictions, we are not able to include all of the responses we received, so we had to make some tough choices, of course. Even so, it is our hope that this special issue will spark a conversation that will continue until the present becomes the past and the future becomes the present. We hope you enjoy this foray into "future world" as we look through and beyond the matrix!

1. Douglas Eyman, George Mason University

Rather than imagining how the world will change over the next decade, and how that might impact the way we teach writing, I am going to take a stance that might appear a bit retrograde and begin by looking back before looking forward. I will focus not so much on what may or should or must change; rather, I will point out what should *not* change—and that is a series of questions that we should continue to ask of our discipline and its object of study.

Even though the pace of technological change appears to be incredibly fast, I think that perception is brought about more by social uses of specific technologies (particularly networks and multimedia tools) than by technological advances alone. What is changing most rapidly are the literacy practices that we and our students are developing and deploying—practices made possible by a particular kind of technological infrastructure. But the development of that infrastructure has been taking place since at least the 1940s; it hasn't happened overnight (even though it may appear so when focusing on particular uses, such as Facebook and Twitter). Thus, looking forward to 2020 may be too short a window in which to imagine significant technological change. Even with a longer future ahead of us, there is a danger in forecasting large-scale technological changes (or even large-scale social changes) because future developments depend upon current practices and the systems—social, technological, legal—that are currently in place to support (or undermine) continued development.

Consider the case of the flying car: in the 1950s, it was assumed that personal transportation would be via air rather than land and that everyone would have their own flying machine. And while such vehicles have been developed, they certainly aren't available. It's not because we don't have the technology to make them work—what we don't have is an appropriate infrastructure (technical, legal, and social) to allow that technology to be put into use and to flourish. We can imagine equally possible technologies for writing and communication in a digital age, but we should also remember that, just as sixty years have passed with no flying cars, our imaginations should be tempered by an awareness of the kinds of infrastructure and social changes such technologies will require.

I generally see myself as an optimist and an advocate for engaging new forms of digital communication, so it seems a bit at odds to be taking what may appear to be a curmudgeonly stance vis-à-vis how we might imagine the future of computers and writing. I would suggest that while it is appropriate to try to imagine the future (and indeed to help build new systems and develop appropriate pedagogies for teaching within these systems), I believe it is critical to remember the primary questions that we need to ask—the answers may change, but the questions nevertheless will help us to negotiate the tensions between new technologies and their impact on writing and our traditional foundations in rhetorical theory and composition pedagogy.

One of the first computers and writing texts that I read (and that sparked my interest in the field, even before I knew that it existed as a field) was *Evolving Perspectives on Computers and Composition Studies: Questions for the 1990s* edited by Gail Hawisher and Cindy Selfe (1991). Many of the questions that were posed in this collection are still relevant (and in some cases even more pressing):

- How can we "provide equitable access to technology for all students"?
- How can we "prevent plans to use computers as inappropriate and ineffective teacher substitutes"?
- How can we ensure "adequate and competent preparation for teachers who will be using computers"?
- How can we "fulfill the promise of hypertext"?
- How can we "meet the challenges presented by the changing nature of literacy in the electronic age"? (Hawisher & Selfe, p. 3)

I see these questions, concerned as they are with probabilities rather than certainties and whose answers come often in the form of recommendations for social action, as squarely within the purview of rhetoric. As a rhetorician, I am interested in drawing on rhetorical theory and methods to help answer these questions. I also see the primary interest of our field as what I term digital rhetoric—the application of rhetorical theory and practice in and through digital media. I make a distinction, too, between digital literacy (being able to effectively use semiotic resources to accomplish

particular tasks) and digital rhetoric (making use of semiotic resources in the process of invention—not just *using*, but actually *making* digital texts).

Considering a theoretical framework that draws on digital rhetoric as a starting point, and keeping in mind the role played by the development and availability of effective infrastructure for new kinds of writing, I suggest that we should ask the following three questions as we consider the future of writing instruction:

- What is "writing"? How do we define it and, perhaps as important, what should we consider outside the purview of writing instruction as writing itself takes advantage of multimedia and multimodal semiotic resources?
- Where is writing? And how do the contexts and networks within which writing takes place structure the affordances and constraints of writing practice and rhetorical action?
- What does writing *do*? How does our understanding of rhetoric-as-persuasion and writing-as-action shape our pedagogical goals?

In the following sections, I consider each of these questions and the current systems and technologies that come into play when we try to answer them. It's important to note that I believe the answers are always changing, always in flux as writing technologies and digital rhetoric practices evolve—which is precisely why we need to remember to continue to ask the questions in the first place.

1.1. What is writing?

It is my contention that writing serves as a means to design a rhetorical act of communication, and this work of designing the rhetorical act can utilize a broad range of semiotic resources, not just printed text. As Gunther Kress (1998) argued:

> Design takes for granted competence in the use of resources, but beyond that it requires the orchestration and remaking of these resources in the services of frameworks and models that express the maker's intentions in shaping the social and cultural environment. While critique looks at the present through the means of past production, design shapes the future through deliberate deployment of representational resources in the designer's interest. (p. 77)

If we take such a broad view of what writing is, then our pedagogical approaches can take into account new forms of writing, including texts, tweets, blog postings, podcasts, video arguments, multimedia and multimodal works that frame interaction as a form of reading, and new forms that we have yet to encounter or imagine. Writing takes place in short bursts and in longer projects; it takes place in print and in other media.

When we teach writing (in this broad sense), it is critical that we teach writers to make informed choices about what medium best suits their purpose for writing and best serves their audiences. No matter what set of semiotic resources is put into play in a particular composition, the fundamental principles of rhetoric can help to ensure successful communication.

1.2. Where is writing?

In some respects, I would argue that the future of writing in the next decade will become more independent of the Web as we know it now; as networked technologies become fully ubiquitous and mobile, the sense of connected networks will shift from a system that is served well by the metaphor of "the Web" to one that is more likely be described by atmospheric terms (we already have "the cloud," for instance). Drawing on fields like media ecology, we may end up with a communications ecosphere, where it is no longer possible to tease apart the individual strands of the Web and where we are required to see our work as part of rich, complex systems of inseparable and inter-related elements.

Two locations of writing that I think will become more prevalent and more important to our development of writing pedagogies are on mobile devices and within virtual environments (including digital games). Indeed, these two locations may well intersect, as the practices and literacies of gaming move fluidly from the virtual space of the game to the physical realm. The ubiquity of the network and the mobility of the writers who are in and use the network require us to reconsider the rhetorical situation and the choices writers make about style and delivery. Luckily, rhetorical theory is robust enough, and flexible enough, to take on the challenges posed by mobility and ubiquity.

1.3. What does writing do?

Writing is performative—it is designed to accomplish tasks, move audiences to take action, respond to a specific exigence. Writing can perform social action, or it can be utilized to support personal activity for an individual writer. In any given case, successful writing is writing that *does* something. All writing is rhetorical by virtue of the exercise of communication as a means to an end, and we would do well to continuously examine what the goals and outcomes of new forms of writing might be. I fear that we sometimes view new forms as a kind of novelty, and while we are delighted by the newness of it, we may not yet be seeing what action these new kinds of writing can perform (and, conversely, the actions to which these forms are unsuitable).

My sense is that writing will more and more be used for collective action, for supporting social performances rather than individual moves to persuasion. Network-enabled collaboration will provide new means for writing to perform social action, and our pedagogies should acknowledge and engage such collaborations (only recently becoming the norm in our classrooms, despite a great deal of research on the processes and value of collaborative writing).

. . .

Regardless of what the future holds, I don't foresee a time when rhetorical theories and methods will cease to serve as the foundation of our work, nor do I believe that more traditional forms of reading and writing will become obsolete. The foundations remain the same, even as we must continue to take into account new opportunities for expression and persuasion that are made possible by new writing technologies.

2. Fred Kemp, Texas Tech University

Clay Shirky (2010) in his recent *Cognitive Surplus* drew a fault line between the ways society engages and employs "societal knowledge" before and after the widespread use of the Internet. Societal knowledge distributed by printed artifacts, broadcast media, and teachers experienced finite limits of replication and distribution. But after the Internet, whatever can be digitized is no longer limited by the constraints on material production and distribution. Digits, as Nicholas Negroponte (1996) so clearly described in *Being Digital*, can be replicated almost infinitely and distributed almost instantaneously for almost zero cost. A digital replication is not a "copy" in the usual sense, but a new instantiation, a kind of complete reconstruction of the words, audio, or video. . . a sort of re-origination. This "re-origination" is not an insignificant point, at least theoretically, as we increasingly discover that with digital representation the idea of an "original" or foundational existence becomes blurred. The idea of knowledge itself becomes less a pouring forth from some initial generative portal and more a kind of cloud of understanding that emerges from communities.

The well of human knowledge can be suddenly sipped by almost everybody at a miniscule cost. The centuries-old market constraints on print publication that required careful calculation and editorial judgment to be profitable have been suddenly lifted, and publishers (and librarians) are growing properly skittish. The need to decide what should be and can be put before the masses stops being a need.

This means that the traditionally assumed instructional mission of tightly funneling the "right stuff" to students has been circumvented. Most any individual in society now has a new agency of access to almost everything anybody has ever thought or written. Equally important, most any individual in society now has a new agency of publishing to the world. These new agencies are not complete, as the knowledge industry undergoes transition, but the handwriting is definitely on the wall. The editorial mandarins who have previously decided what does or does not get out to the population as a whole find themselves managing a control panel that is blinking nothing but red.

New problems arise. Now that anybody can access almost any information, the problem becomes what to pay attention to and what to believe: the "eyeballs" that Richard A. Lanham (2006) in *The Economics of Attention* talked about. But along with the eyeballs, we need criteria to judge what is valuable and what is junk. The nature of "how to think" becomes a different game from when we were fed professionally vetted information; we now individually have to decide at the point of access the value of what we encounter.

Teachers are inherently and sometimes egotistically managers of the knowledge they have dominion over. There will be a somewhat painful "letting go" of this managerial role, however, as learners increasingly need not so much a "what" to know as a "how" to know, and this shift will significantly affect the teacher's role. Predicting the character of this new role is a risky business, but the significant transitions provoked by the Internet beg for such prognostication. So I will try.

Composition instruction will no longer be driven by formal models of exposition, as it remains in most writing classrooms in spite of decades of professional admonition to the contrary. Teachers will increasingly find ways to encourage what to many of them and to outside critics will seem a sloppy knowledge pastiche or collage, as students learn to wrestle with making sense of what they encounter on the Internet. The forms of student presentation will look pretty strange to those who romance the formalisms of the 19th-century academic essay and the charming pieces of E. B. White. The traditional patterns of thesis and support will blur into what will seem to many like a kind of blather, and will probably be pretty much blather at first, the blog-dump that so irritates English teachers. We are in for a decade of intense English-teacher irritation.

What makes blogs appealing, however, is not usually the precise prose and formal diction, nor the validity of the assertions. It is the heart. Many more people in this country are reading blogs than academic essays, mostly because of the heart. The role of the writing instructor will be to bring responsibility to how information is appropriated and a measure of coherency to the written product, by modeling how people can use the Internet, but without stifling the heart. They can't do this, of course, by rejecting Wikipedia as a source and proclaiming self-righteous ignorance of blogging and wikis in a kind of desperate rear-guard action.

Back to the risky business. Teachers will start not by showing students what to write but by asking them to find something on the Web they are interested in. Post it to the class in a wiki or email or wherever. It should be anything not illegal or immoral. Anything, even if it makes the teacher grind his teeth. Once a body of "research" has been gathered, posted, and possibly discussed online, then the teacher should ask her students to make sense of what they have gathered. The teacher will be asked what "make sense of" means, and here is the principal teachable moment. Here is where the skill and generosity of the teacher should be fully brought to bear. Here is the fulcrum of 21st-century writing instruction.

I can think of many ways to discuss and teach "make sense of," but so can anybody who has taught for a while. The point is "make sense of" is the lynchpin of a writing instruction arising from an information-saturated society. I love beautiful prose as much as anybody, and those students who for whatever reason engage their own writing seriously will probably develop a similar affection and naturally incorporate it into their own writing. The vast majority of students will not, a reality that gnaws at those English teachers who want to create or discover wonderful writers.

But the real point is "make sense of." Society enjoys beautiful prose. Making sense of, in a productive and responsible way, the fire hose of knowledge coming out of the Internet is what society needs. The first job of all writing instructors is to inculcate a recognition of the need for managing responsibly and critically the vast knowledge resources of the Internet. Students need to make sense of what they are being swamped by. And, given the right instruction, they can.

A successful society, of course, is the product of successful institutions, so it does no good to claim (or accuse) some sort of Timothy Leary "tune out" benefit to the Internet. In the end, the distributive influence of the Internet on societal knowledge must support our society's institutions, so my particular advocacy is not an abandonment of the sort of thing teaching has been doing in the last 200 years in our country, but a relatively serious paradigm shift to a different instructional game plan. A valuable part of this paradigm shift lies in listening to students as they talk to each other online and then taking their interaction seriously. Teachers are not used to listening to students talk amongst themselves, or listening to students much at all, so the pedagogical value is probably strange but oddly compelling, once engaged. This interactive online discourse has its herky jerky, apparently irrational character, but the irrationality after a while becomes recognized more as our structural prejudices than their structural disability. People make sense with each other, inherently and inevitably, whatever their maturity or educational level. The composition teacher just wants students to make sense in a larger expressive domain.

And that's a reasonable requirement, but it must be accumulated as a skill from inherently communicative tendencies now enabled on the Internet. The Internet is the most appealing and expressive technology that humanity has ever encountered; the point for teachers is not to push that round peg into our square hole, but to make the Internet a productive technology for what people inherently want to do, make sense with each other.

3. Mike Palmquist, Colorado State University

For more than a century, the most ubiquitous form of information technology in writing courses has been the textbook (with apologies to pencils, pens, paper, and word processors). In coming years, that will continue. But what we mean by "textbook" will change.

We've seen the beginning of this change in the growing use of open-access instructional materials through sites such as the Purdue OWL <http://owl.english.purdue.edu/>, the Writing Spaces book series <http://writingspaces.org/>, <http://Writing@CSU/> and its Writing Studio <http://writing.colostate.edu/>, and the WAC Clearinghouse <http://wac.colostate.edu>. At Colorado State University, where the materials available through Writing@CSU have been used in courses since the early 1990s, several colleagues have told me they use those materials in place of a textbook. And why not? For instructors whose needs are not met by textbooks currently on the market, or who seek to offer a constructive response to the growing cost of a college education, these materials offer an inexpensive (read: free) means of assembling what becomes, in effect, a custom textbook.

As a textbook author, I'm well aware of the value of commercial textbooks. The careful peer-review process that textbooks go through (a process, by the way, that makes the review process for scholarly books and journal articles seem somewhat cursory in comparison) helps keep each new book or edition current and responsive to the needs of a wide group of students and instructors. Moreover, the significant time, effort, and insights that editors and technology specialists bring to the development of new and revised textbooks adds significantly to their quality. Perhaps I'm a less efficient writer than most, but I spent years on the first editions of my two major textbooks, and the revision of each new edition has involved at least a year of additional effort. It's difficult for me to see how, as scholars with significant demands on our time, we can develop textbooks (or materials that might be used in their place) of comparable quality.

Difficult... but not impossible. For more than two decades, beginning with the Writing@CSU project in 1991 and continuing through the latest instantiation of the WAC Clearinghouse and the recently reconfigured Research Exchange (researchexchange.colostate.edu), I've worked with a large number of colleagues on open-access publishing projects that suggest how we might work together to create alternatives to commercial textbooks, scholarly books, and scholarly journals. In 2003, in a presentation to the Research Network Forum at the annual meeting of the Conference on College Composition and Communication, I characterized these efforts as leading to what could be called publishing collaboratives (Palmquist, 2003). I pointed out then—and I'll repeat myself here because the essential outlines of that framework apply now even more than they did then—that transforming scholarly publishing in ways that will lead to the wider and more timely dissemination of our work would require relatively small changes to our publishing practices. Those changes involve, in a nutshell, changing the barter arrangement we've entered into with publishers, an arrangement in which we've assigned copyright to our work to publishers in exchange for what was once the significant cost of investing in the means of production that turns our words into printed books and journal articles. That arrangement has also involved significant contributions of our time to the communal work of reviewing proposals for new books, reviewing book manuscripts and journal articles, and serving on the editorial boards of journals and books series.

As the means of producing books and journals have changed, so has our need to enter into this kind of barter arrangement. Add the calls from librarians, professional organizations, and government agencies to ensure open access to our scholarly work, and it seems even more sensible today than it did at the start of this decade to use new publishing technologies to ensure that our work finds the widest possible audience. In essence, we can use our personal computers, institutional Web sites, and various forms of Web 2.0 technologies to develop and distribute our work in a wide range of digital formats, and we can enter into direct relationships with printers to ensure access for those who wish to read print documents.

This process has been proven to work by projects such as the WAC Clearinghouse (home to more than 40 open-access books, of which nearly half are original monographs and collections and the rest are available as digital "reprints" of books that have gone out of print), the Writing Spaces book series, and the Computers and Composition Digital Press. These projects indicate, as well, that reducing costs and increasing access to our work need not require abandoning our relationships with commercial and university presses. Each of these projects has variously worked with publishers including Parlor Press, Utah State University Press, the University of Wisconsin Press, and the National Council of Teachers of English, among others. We are almost certain to see more of these projects emerge in the coming years, and I fully expect their scope and sophistication to increase markedly over what we've accomplished so far.

Among the most promising areas of expansion are textbooks. I've suggested that the significant resources commercial publishers bring to the development of textbooks will be difficult, if not impossible, to replicate in non-commercial ventures. Yet, with appropriate planning, institutional support, and some reasonable changes to our scholarly reward structures, we might come close. We can certainly offer alternatives that will be acceptable to a significant number of instructors.

A number of open-access textbook projects have been initiated over the past several years. Some projects, such as Joe Moxley's Writing Commons <http://writing commons.org/>), Steven Krause's *The Process of Research Writing* <http://www.stevendkrause.com/tprw/>, and Chuck Guilford's *Paradigm Online Writing Assistant* <http://www.powa.org/>, have been essentially solo efforts emerging from traditional textbook publishing projects. Others, such as the Writing Spaces series and the Open-Access Textbooks Initiative launched in 2009 as part of the Writing@CSU project, have been designed to produce larger collections of teaching and learning resources. The latter projects fit well into the framework of publishing collaboratives. They allow distributed groups to work together effectively without the need for tight control over individual action; employ technologies to reduce production, distribution, and marketing costs; and provide structures within which members of the collaboratives can claim credit for their work within existing scholarly rewards systems (for activity theory analyses of publishing collaboratives, see Palmquist, Kiefer, & Salahub, 2009; Palmquist, Mullins, & Blaylock, 2011).

Over the next few years, I look forward to working with the strong group of scholars who have joined me on the Open-Access Textbooks Project. Our goals include reviewing and improving the materials currently on the Writing@CSU Web site; developing tools that allow individual teachers to build custom textbooks from these and other peer-reviewed, open-access instructional materials (as well as their own materials); and creating tools for distributing these textbooks in digital and printable forms. By adopting the editorial board/editorial staff/contributing member approach that has proven to work well in the WAC Clearinghouse project, we anticipate that we'll be able to develop a sustainable textbook project that has the potential to benefit a wide range of students and instructors.

Creating a system for distributing open-access, customizable textbooks (customizable to the point where they could also be reconfigured and extended by other instructors) offers a number of benefits. In addition to the obvious benefit of supporting instruction, the development process will help us understand how to build better systems down the road. As new systems are built, we will most likely look back on current efforts as quaint, but well intentioned. In this case, however, our intentions might be the most important aspect of the project because they will lay the foundation for more robust publishing collaboratives (and more effective and useful open-access textbooks) in the future.

4. Bill Hart-Davidson, Mike McLeod, Jeff Grabill, The WIDE Research Center

Answer: Robots

That is the simple answer, at least, to all of the questions posed here: robots. Allow us to clarify.

We believe we are already seeing the beginning of the next wave of technologies that will bring about large-scale changes in how written communication is practiced and how it is valued. It will not be a single lynchpin technology like the printing press (Eisenstein, 1980) nor will it be a platform like the Internet. It won't even be a protocol like HTTP (Berners-Lee, 1989). It will be a class of small (or small-ish) automated analytic functions assigned to do tasks that are incredibly tedious, repetitive, distributed in space (and perhaps time). This will be a new class of "little machines" (Johnson-Eilola, 2001) driven by logic but put to work for explicitly rhetorical purposes. Robots.

As bits of code, these robots will live in the same cloud where content lives and will be accessible in all the ways we have begun to be accustomed to contributing content to the cloud: via a browser on a desktop or laptop, via a mobile device on a wireless network. But robots will also be triggered by sensors embedded in all sorts of physical devices as well—smartphones, sure, but also cars, doorframes, asthma inhalers, and just about any other object humans might interact with in some fashion.

"Hold on a second," we hear you saying. How is all of that *writing*? Good question. First, let us reiterate a point made by computer-supported cooperative work researcher and theorist Paul Dourish (2001) in his book *Where the Action Is*. Dourish explained that with the advent of wireless networks and mobile devices, computing, more than ever, becomes not something that people do but rather the medium that supports what people do. Computing, itself, is invisible, forming the deep substrate of a rich set of delightfully diverse and chaotically social action (see, e.g., MySpace, Farmville, SMS messaging, etc.). Nobody using a computer or a mobile device would answer the question "So. . .what are you doing?" with the response "I'm computing." Computing, instead, forms the phenomenological infrastructure that permits humans to go on being human, more free from the

tethers of time and space, and free to all but ignore the mathematics going on to resolve the transmission of network packets, to translate a video codec, or to reconcile a user's identity with a bank account and, thus, a consumer identity.

Writing, too, is a medium. Writing is where the action is but isn't what the action is *about*. For most people writing is as invisible and as tedious in its day-to-day incarnations as the math that our computing machines do. Writing is a means to an end. A way to get things done. Where the action is but not what the action is about. Genres of written discourse—and here we invoke Carolyn Miller's (1984) and Catherine Schryer's (1993) conception of genres as routinized social action recognizable post-hoc as relatively stable textual forms—are often a necessity by custom, but not necessarily by motive. You understand: if we don't have to fill out a form, or if a robot can fill it for us, for example by sensing our smartphone when we walk into an emergency room and pulling our electronic medical record to complete a patient intake procedure. . .well, you get the idea.

Robots will be engaged in conjunction with many—likely most—writing practices, augmenting and extending human capability across what we have accepted for thousands of years to be the range of rhetorical performance: invention, arrangement, style, memory, and delivery. They won't automate all types of writing—though there are some already building robots to do that sort of thing. No, the writing robots that will populate most of our lives will be set upon much more mundane work than, say, writing haiku (Koehler & Mishra, 2002). They will spend most of their time simply listening, gathering up what humans are doing and saying to one another across a variety of media, and applying some analytics meant to make this or that commonly repeated human action visible, understandable, sharable, easier, more reliable, or more efficient.

Writing teachers and researchers should not fear the coming swarm. As we engage these bits of code to do what is operationally necessary, we will have an expanding scope of rhetorical action to investigate, embrace, and yes, teach. We'll let others convince you of this point, perhaps.

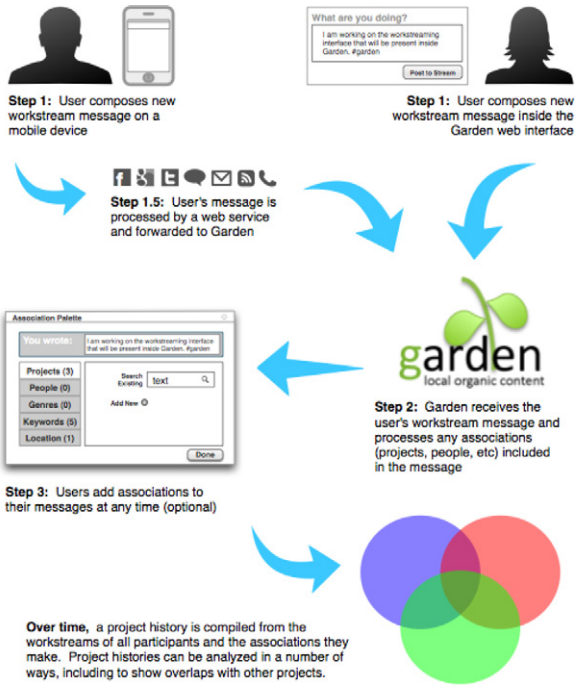
We want to convince you of something else: you should be building robots. Robots need direction. Someone who knows writing practices and how they work in social structures must be the brains that set them in motion, tell them how to listen and how to respond, tell them when they are going too far and when they could be doing something more. To make this case, we want to show you something: a robot that we have built in the research center where we work.[1] We think of this robot in terms of the service that it helps to provide folks who are working as part of a collaborative team. We call it "Garden workstreaming" [here, you'll pardon the shift in tone to something similar to Neil Patrick Harris á la faux newsreel-speak in *Starship Troopers*].

Garden workstreaming is primarily a *listening* service. A workstream is our name for the ambient data produced when team members collaborate—documents, messages sent by email or SMS, status updates posted to a social networking service, updates to files stored in a shared content-management repository, calendar events entered or milestones achieved in a project-management timeline. Garden workstreaming permits a team of people working together to assemble a detailed project history that includes all of these bits of information, as determined by the team, so that team managers and members may better coordinate project activity. They contribute to the stream simply by carrying out their work as they normally would. The workstreaming robot listens and remembers, sorts and analyzes, gathers and presents views of that activity per the requests and preferences of team members. Workstreams constitute rich data sets that can be analyzed to provide strategies for better achieving team productivity goals. But assembling and analyzing them is a job for robots. Why? It's too tedious for humans. And we have more important rhetorical work to be doing in the meantime.

4.1. Coordinating team activity with garden workstreaming

A workstream exists for a specific project, where a project is defined as collections of people (e.g., project team members), objects (digital files), and their collective actions. As these actions produce texts or are transformed into texts, these are subsequently collected and assembled into a workstream.

[1] The Writing in Digital Environments Research Center at Michigan State University is where Bill, Mike, & Jeff have built Garden Workstreaming and other robots.



Our analytic approach to workstreaming allows for better *coordination* among team members:

- Many team members may contribute to many workstreams
- Distributed creation, updating, and monitoring of project status through the use of mobile devices and multiple command, updating, and reporting protocols
- Management of associations among digital objects (e.g., files) and workstream updates to build context for objects in a shared repository
- Ability to analyze and view project histories over time
- Ability to view individuals' contributions across a variety of projects

A key advantage to our system is the ability to update a workstream via a number of methods, including many of those that knowledge workers already use. Our method involves the ability for the listening robot to parse commands (e.g., create a new project, send a status report) as well as receive updates and content objects such as photos or video clips via mobile devices. Team members can also connect via various third-party services (e.g., Twitter, Facebook, FourSquare) as well as through direct methods (e.g., email, SMS, or a Web portal).

4.2. Analyzing team productivity

Our robot assists people engaged in collaborative work with understanding team work patterns via analysis of workstreams. Based on a mathematical model for achieving *equilibrium* in physical systems, the robot can account for repeated patterns of productive behavior that correlate with a team's metrics for success (e.g., successful bids or proposals). We also look for new or disruptive patterns, as these can be sources of innovation or trouble, depending on the outcome. Imagine what our sales pitch might be like. . .

> With workstream analytics, our robot can alert you when your team has created a new pattern of behavior that bears repeating. We can also let you know when the team may be heading off course with enough time to call a meeting or take other corrective action.
>
> How does something like that work? Equilibrium is directly measurable as a function of actions taken to "balance the books"—that's what the word means in Latin! Repeated actions that represent successful team strategies,

over time, become noticeable as stable patterns of written communication. They become familiar, they require less individual effort, and they arise in sequences of activity that are predictable, too. We watch for indicators of these patterns and show you in simple visual notation what individuals and teams are doing in particular projects or across several projects. We can then recommend specific actions to achieve more stable (i.e., repeatable with less effort) patterns of work that achieve the same ends.

Won't you help us? You see, the robots are coming. And they want us to tell them what to do.

5. James P. Purdy, Duquesne University

Enhancements in portability and mobility will continue to change our—and our students'—expectations regarding accessibility—to texts, to information, and to one another. Being online (in developed nations with Internet connectivity) will be an ever-present state, not a locationally dependent activity, as more and more people carry communication devices (e.g., smartphones, e-readers) that are networked computers. Writing, reading, and researching activities will happen from anywhere, which will continue to make these practices more frequent, less controllable, and less bounded. Recent WIDE (Grabill & Pigg et al., 2010) and Pew Internet and American Life Project (Lenhart et al., 2010; Lenhart et al., 2008) studies support anthropologist Susan D. Blum's (2009) assertion that "In some ways this is the *wordiest* and most *writerly* generation in a long while. These students are writing all the time, reading all the time" (p. 4, emphasis in original). The frequency and freeness of these writing, reading, and researching activities will heighten students' sense that the best texts are those that are quickly accessible and always available—two clicks away on an iPhone, downloadable on a Kindle, the first or second result on a Google search. In fact, this is already happening (Hargittai, Fullerton, Menchen-Trevino, & Thomas, 2010; Head, 2007; Purdy, under review) and, I would argue, not (primarily) because students are lazy but rather because they are used to (somewhat) open access. As the future Web makes access easier, students will develop less patience for "gatekept" information. The idea of restricted access may come to seem not only curmudgeonly, but also unproductive for knowledge work.

Take, for example, archives, research spaces previously primarily accessible to only professional researchers. When moved online and reachable through mobile computers, archives remove temporal and spatial obstacles to conducting archival research. This claim, perhaps optimistically, assumes that digital archives are accessible to differently abled people, for instance, those who have visual or hearing impairments, and, regrettably, not all Web sites, let alone digital archives, provide such accessibility (see Slatin, 2001; Zdenek, 2009). In digital archives, however, researchers can access materials quickly whenever they want as source retrieval can take seconds and searching is not limited to business hours. Researchers, moreover, can access contents of digital archives from any computer with the necessary connectivity and configuration. They need not have special credentials or travel to particular physical locations to view archival artifacts. For instance, researchers can access at 3 a.m. from the comfort of their living rooms literacy narratives of students and faculty of color in the Digital Archive of Literacy Narratives, historical maps of Los Angeles in the HyperCities project, or paintings from the Cleveland Museum of Art in ARTstor. The resulting convenience can make archival work more attractive to both seasoned and beginner researchers, which can make them more likely to use digital archival materials and even to include their own texts in digital archives, allowing more people to see themselves as researchers and research contributors.

Indeed, the research opportunities provided to vast populations are perhaps some of the most significant changes brought by Web 2.0 and computer portability. The WikiLeaks phenomenon—thousands of protected government documents freely available online—would have been impossible just a few years ago. While many people understandably do not see this particular example as a positive development, the possibility for what were previously highly guarded texts to be accessed in seconds by millions is nothing if not revolutionary. With the proliferation of such occurrences, our students' default notion of "text" will increasingly be one that is freely available, potentially circulated widely, and viewed by unknown (and even unintended) readers. As computers and composition teacher-scholars, we will be called upon to help students understand the evolving notions of delivery, audience, citation, and plagiarism brought by such developments.

The convenience afforded by networked computer portability will also continue to change expectations for what constitutes successful research. Ease of use, for example, will continue to be valued, particularly by students dubbed millennials and digital natives. In a survey conducted of over 500 first-year composition students at a mid-sized Midwestern University, students offered ease of use as the primary reason—by a margin of over 2:1—why they

identified a particular research resource as their favorite (Purdy, under review). We will, then, need to understand better what features and characteristics students associate with ease of use.

But even among academics, expectations—and practices—will change. They have started to already. For example, in their survey of scientists regarding their article researching and reading behaviors, Carol Tenopir and Donald W. King (2008) learned that over half of the texts scientists read in 2005 and over 90% of searches they conducted that same year were from Web-accessible sources ("Analysis"). Cultural studies theorist Gary Hall (2008) similarly affirmed that "research published open access is somewhere between two and four times more likely to be read and cited than if it is just published in ink-on-paper form" (p. 47). As more texts are digitized and born digital, these numbers will likely increase—across all disciplines. Though resistance to digital research and writing will certainly not disappear in the next decade, its acceptance will be more widespread. As teacher-scholars with expertise in digital research and writing, we will be called upon to explain and justify such work—not only within English studies, as we have begun to do (e.g., Ball, 2010; Ball & Moeller, 2008; Purdy & Walker, 2010; Purdy & Walker, forthcoming), but across the University and to non-academic publics.

6. Madeleine Sorapure, University of California, Santa Barbara

In trying to envision what we might be doing in our classrooms a decade from now, I'm drawn to thinking about what I was doing a decade ago. Of course, given the frantic pace of technological development, ten years in the past might enable us to see only a few years into the future. On the other hand, pedagogical and curricular change doesn't happen at an exponential rate, and in classrooms as in all other venues in our lives, we keep up with technological change variably and unevenly. Although some developments cause rapid, significant shifts in our everyday practices, others register hardly at all, or at least not at the level of conscious recognition.

Notwithstanding the complexities of technology's impact on our lives, I feel confident in saying that changes in the landscape of software have had and will continue to have a major impact on our field. In particular, the development of Web-based and Web-distributed applications to augment or replace single-user, proprietary desktop applications provides composition teachers with new possibilities as well as new problems. The ongoing development of the Web as a platform for software—the idea, in Joseph Feller's (n.d.) words, that "a Web site can deliver the same, or better, functionality than the equivalent application on the desktop"—has many potential ramifications for composition teachers. This is true for those of us who teach courses entirely devoted to multimodal production as well as for the vast majority of teachers who ask their students to produce work primarily in print but who are exploring ways to expand into other modes.

As recently as 2008, I would spend much of my ten-week "Writing in New Media" course teaching students specific applications: Photoshop, Dreamweaver, and Flash—Adobe's triumviri. These were the industry standards and there were few other viable options that students could use to create and edit graphics, produce Web sites, and experiment with animation and interactivity. However, ten weeks to gain proficiency with three sophisticated programs was clearly insufficient. Moreover, students were very unlikely to own these programs, and there was a good deal of inconvenience associated with going to the university's computer labs to work on projects in the evenings and on weekends.

More tools gradually became available, including open source programs that provide most of the functionality of proprietary programs (e.g., Open Office, GIMP for image editing, Nvu for creating Web pages). Although these and other open source programs certainly have advocates within and outside of our field, I found them difficult to integrate into my courses, largely because they weren't available in the computer labs in which I taught. As Stuart Selber (2009) noted, "No literacy event is an island unto itself; writers depend on such institutional resources as Internet backbones, email servers, library databases, wireless networks, spam filters, and more" (p. 12). Having Adobe and Microsoft software installed on the computers in my classrooms and being discouraged from installing other programs certainly influenced my decision to teach these programs and to design assignments based on their features and capabilities.

Using the Web as a platform for software applications removes the constraints associated with downloading and installing proprietary or open source software. With an Internet connection, students can access many different types of programs from computer labs as well as from their own computers. For instance, rather than using Photoshop or GIMP, students can create, upload, edit, and store images using online image editors such as Pixlr <http://pixlr.com/>, Aviary <http://www.aviary.com/>, SumoPaint <http://www.sumopaint.com/home/>, and Picnik <http://www.Picnik.com/> (there are many more). For presentation software, Prezi has become a viable, if dizzying, option with some clear advantages over PowerPoint; a Web-based presentation application written in Flash/ActionScript, Prezi facilitates the

collaborative creation and sharing of non-linear, zooming and twisting, highly designable though not always well designed multimedia presentations. Some Web-based applications are free (for now, at least), others are free-ish (that is, they come with advertising or require registration), and still others (like Prezi) are monetized via subscriptions and optional premium packages.

In addition to using these applications, I've recently begun incorporating smaller, Web-delivered, niche programs, so to speak: downloadable, free programs that enable specific kinds of compositions. For instance, Megazine <http://www.megazine3.de/home.html> is a Flash-driven pageflip engine; students can create and upload digital books with pageflip and other visual effects by modifying the XML code associated with this application. Nivo Slider <http://ww5.nivoslider.com/> is one of a number of free slideshow applications that can be downloaded from the Web; students create slideshows by modifying some of the code and inserting their own images. Because they use common Web technologies (e.g., Flash, JavaScript), these applications don't need the same level of administrative approval to work on lab computers, and students can download the applications onto their own computers as well. Furthermore, like wikis, these applications encourage a bit of tinkering and low-level coding, and they offer online documentation and support to make the process relatively painless.

If the development of Web-based and Web-delivered applications continues, as it seems likely to do, our teaching practices will ultimately have to shift and adapt. With more choices, we need to teach skills and strategies that transfer across applications rather than (or in addition to) specific step-by-step procedures for specific applications. As Kevin Kelly wrote in "Achieving Techno-literacy" (2010), "Before you can master a device, program or invention, it will be superseded; you will always be a beginner. Get good at it." Although this isn't altogether true—after all, technologies have different lifespans, and it's certainly worth spending the time to master some of them—Kelly is right to suggest that we need to develop in ourselves and in our students a more general technological proficiency. In the past, there were certain default applications that were institutionally supported and widely used in businesses and organizations. In the future, this may no longer be the case and we may instead increasingly be asked to perform a first step of selecting from a range of possible applications, matching the tool closely to the context of its use. For instance, a relatively unsophisticated application with minimal features may actually be preferable to an application full of bells and whistles, if the goal is a low learning curve and low cost. In short, we need to refine techniques of searching for and assessing our software options.

As a pedagogical resource, it would be helpful to have a wiki where teachers could post annotated links to Web applications they've used, sharing their experience and assessment of the application along with tutorials, assignments, and even student work created with the application. Over the past year, I've built a wiki like this for my courses, and I know that other colleagues have as well. But, a broader collaborative undertaking could help us all to stay current with Web-based applications and to have a clearer sense of our options.

One important factor in assessing Web-based applications is determining their cost. Whereas the costs of proprietary and open source applications are a fairly straightforward matter, Web-based applications cost differently, so to speak. We need to consider—individually, institutionally, and collectively— which costs are acceptable to pass along to students and which are not. A subscription that lasts only as long as the course is offered may be less expensive in the short term than buying desktop software; ultimately, though, the student is left with nothing once the subscription runs out. Moreover, Web applications change their services and fees regularly, so that a free feature today may incur a fee tomorrow. This makes course planning quite tricky, and it may tie students to ongoing fees in the future if they want to continue to create multimodal compositions after the course is over.

Non-monetary costs of Web-based applications are also an important factor in their assessment. Advertisements that accompany a composition, registration that leads to junk mail or intrusions of privacy, limited control over what students post online—these are all costs of software that is "free," and we must attend to them carefully as we decide what we can reasonably, ethically require of our students. Web-based applications also have different constraints that impact their use. In many instances, these programs yield what Kristen Arola (2010) described as a "loss of design agency" (p. 6). While Arola referred primarily to the design limitations imposed by templates in Facebook and MySpace, other Web-based applications impose limitations and constrain the kinds of compositions that students can produce.

Ultimately, though, the most compelling appeal of Web-based and Web-delivered applications is that they make it easier to ask students to work on multimodal projects and therefore make production more likely. I appreciate the optimism struck by Daniel Anderson (2008) in his description of the low-bridge, prosumer media technologies: "Unknown technical things create ideal situations in which literacy-enriching problem solving activities might play out." (p. 43). There's no telling, really, how we'll be using the Web in our classrooms a decade from now; my literal

and conceptual vision is far from 20/20 at this point. But our current path of expanded opportunities seems to me to be a very promising one.

7. Kristine Blair, Bowling Green State University

In their 2005 *Kairos* webtext "Why Teaching Digital Writing," The WIDE Research Collective stressed the need to articulate the impact of new media on the material conditions of writing specialists:

> Digital writing makes visible needs that writing courses and curricula and programs that we haven't previously articulated, or needed to articulate. These needs complicate and extend the pressures we already feel and that we already exert—perils and possibilities related to teaching and working spaces, evaluation, class size, access to computer labs, access to wireless teaching spaces, design of curricula, staffing and labor, and more. Many more. (online)

Elsewhere I have also argued (Blair & Monske, 2003; Blair & Hoy, 2006) for a similar need to consider the impact of technology-based pedagogies on the working conditions of faculty, particularly graduate students as future teacher-scholars likely to be working within Departments of English, and to not presume that the "ubiquitous" nature of the Web allows for its equally "ubiquitous" integration into the English studies curriculum. For me, this is one of the continuing obstacles to successfully integrating Web 2.0 pedagogies into 21st century writing pedagogy: (1) that we need to more forcefully advocate for digital literacy training among graduate students who are likely to model practices they observed in both their undergraduate and graduate educational experiences and (2) that we need to work to ensure that such digital literacy training is consistent for a broader constituency of graduate students, not just those interested in computers and writing, or those specializing in rhetoric and composition. My emphasis on graduate students is a pragmatic one: as future faculty and administrators, they will be the ones who need to address the question "Why teach digital writing," and if they are not able to do so, then they will not be able to counteract a digital and ideological divide between those departments and writing programs that integrate Web 2.0 in the teaching of functional, critical, rhetorical literacies, and those that do not.

The WIDE Research Collective acknowledged that "[w]e think that if you are reading this, you are not someone who needs to hear the answer to the overriding question posed: Why Teach Digital Writing? Rather, you are someone who needs to construct an answer to the question, for many different audiences, over and over again." I am such a "someone," a computers and writing specialist, an online journal editor, and most recently, a department chair of a mid-sized English Department with approximately ninety graduate students, most of whom receive little to no training in teaching the digital writing the WIDE group originally advocated and what the guest editors are clearly advocating six years later in the pages of this special issue. Indeed, what I hope to assert here is that in our own such dialogue within the scholarly community of computers and writing, we ultimately may be talking to ourselves at the expense of dialogue with those outside of our own community. For many of us, this includes our colleagues in Departments of English who have had much less opportunity to consider the impact of Web 2.0 on teaching and scholarship within the discipline.

This communication gap is largely due to disciplinary divides within the larger field of English studies that relegate training in digital literacies to either a single course (I teach such a course myself), if that, or as the concern of some programs, such as rhetoric and composition or technical communication, above others, such as literary studies. At the same time these graduate students in English—and likely a far greater number of graduate students outside of English—do not receive such professional development in a consistent or longitudinal manner within their graduate careers, the attention to technology in the literate lives of undergraduates is thriving. The academy often scapegoats these non-academic literacies as the cause for what are increasing deficiencies in traditional print literacies, even as universities hypocritically use those same digital literacies via tools such as Facebook and Twitter to recruit students. Yet far less attention is devoted to the theme of this special issue, e.g., to understand how Web-based literacies will change what it means to read, write, and research in college and K-12 environments.

As a result, the access to and acquisition of Web-based literacies should be a collective concern of faculty in English Studies as we prepare graduate students for the academic job market and to assume responsibilities as teachers of English in the 21st century. Addressing these concerns not only will help graduate students transition from pre-professional to technology-aware faculty but also will help to provide opportunities for Web-based scholarly publication that better fit with the changing discourse conventions of new media research, a factor that will inevitably call for more recognition of these research processes in tenure and promotion processes. We are fortunate in the computers and writing community

to have venues such as the Graduate Research Network (GRN), which provides a safe space for graduate students to align theory and practice in their emerging digital writing research. The GRN ultimately helps these future faculty navigate the inevitable politics within academic departments and to develop answers to the ever-important question, "Why teach digital writing?"

Another significant advantage of Web 2.0 is that many tools available for blogs, wikis, and social networking are free or open source, allowing graduate students to see that there are options beyond the standard course management system that their current institution may support but that smaller institutions may not, as they shift from a technology-rich to what might be a technology-challenged model. As graduate students become more comfortable with these technologies in both personal and academic contexts, there is a chance to bridge the gap that Prensky (2001) has identified between digital natives (students) and digital immigrants (teachers) so that we might consider what role the digital tools universities are providing as recruitment incentives actually can play in our classrooms. Equally important, we can begin to establish what Prensky (2010) referred to in his most recent book *Teaching Digital Natives* as a partnership:

> With the advent of digital technology, and the realization that, in the modern world, young people have a very real and equal contribution to make to their elders—at the same time that they learn from them—new forms of social organization. . . have emerged. . .. This newfound mutual respect between young and old is clearly the way of the future. (online)

Because many readers of this special issue are digital writing specialists, it may seem as if I am "preaching to the converted" in ways that I advocate we need to move beyond. And just as the WIDE Research Collective originally acknowledged, I recognize that I likely won't have disagreement given this primary audience of computers and writing specialists. What I urge those of us in our community to consider, however, is our role in enabling this call to action. How do we talk to our colleagues across programs about the success and job placement of graduate students and the role of technology in this success? How do we foster a critical interrogation of the appropriate pedagogical use of social networking tools that are so much a part of our daily culture that they comprise more reading and writing on the part of the students than traditional print-based academic literacies?

It is increasingly clear that the future relevance of English Studies will rest on the ability to share responsibility for teaching multimodal, Web-based literacies, a responsibility endorsed by the National Council of Teachers of English, the Conference on College Composition and Communication, and even the Modern Language Association. Sharing responsibility isn't easy; our own discipline has frequently acknowledged the impact of technology on academic labor, particularly the invisible workload of experimenting with digital tools and developing digital curricula (Takayoshi & Sullivan, 2007) and the limited professional rewards that result when so many tenure and promotion systems continue to value print scholarship paradigms.

Despite these constraints, if graduate students in English have no opportunity to observe Web-based teaching practices within their respective programs, and a similar lack of opportunity to deploy it within their emerging classroom practices, and by extension disseminate the results of those practices in digital form, this will inevitably lead to a reinscription of traditional print-based academic labor practices within their future careers. From my perspective both as a department chair and as an online journal editor, this will also perpetuate the have/have not dichotomy in undergraduate and graduate programs across the country for years to come, particularly if future faculty do not develop a sense of how to advocate for Web 2.0 curricula in English Studies that bridge the gap between what students do with technology outside the academy and what we do (or don't do) with it inside the academy. In *Because Digital Writing Matters* (2010), Dánielle DeVoss, Eideman-Aadahl, & Hicks (2010) asserted that

> students are doing an immense amount of writing—they're blogging, they're text messaging; they're emailing, they're updating their status messages, profile information, and live feeds on social networking and other sites; and others are "tweeting". . . Perhaps most interesting in the midst of all this writing students are doing is that they don't often call it "writing." (p. 19)

In order for our students to view these digital practices as writing, we need to consistently validate such practices as "writing" across the English curriculum and beyond.

Ultimately, as Cindy Selfe (2004) has suggested, to "make it possible for students to practice, value, and understand a full range of literacies. . . teachers have got to be willing to expand their own understanding of composing beyond conventional bounds of the alphabetic. And we have to do so quickly or risk. . . becoming increasingly irrelevant" (p. 54). To avoid this fate and risk only talking to ourselves, we must encourage faculty colleagues across the English

department and across rhetoric and composition programs to share the responsibility for their graduate students' growth in digital literacy at all phases of their professional development, rather than presume that digital literacy acquisition will just evolve without such intervention. This will be vital to sustaining a partnership between technology and pedagogy, not to mention between undergraduate students and their teachers.

8. Christine Tulley, The University of Findlay

Most existing scholarship on assessing multimodal and new media texts focuses on individual class assignments, perhaps recognizing early findings within the field of composition that integrating multimodality into composition courses was a largely solitary endeavor (Anderson et al., 2006).

Writing assessment is in a state of flux as writing program administrators, faculty, and students struggle to adjust to a rapidly changing menu of mobile technologies, cloud computing, and the increasing number of free digital audio, image, and video editing software available for students to compose class assignments. Emerging prototypes of rubrics exist to help faculty assess student multimodal compositions that use audio, video, etc. (see Cindy Selfe's 2007 edited collection *Multimodal Composition* for several examples of rubrics).

However, assessment of writing *at the programmatic level* to recognize texts composed using Web 2.0 and new media tools is a logical, and critical, next step. Most composition courses, particularly those considered part of first-year composition, are part of larger college requirements, and many writing programs have exit communal assessment processes where paper portfolios have historically been "trade graded" (Eng, 2006). If instructors are incorporating digital assignments, then there needs to be a way to access these texts across sections as part of the larger shift to recognize what first-year composition looks like when composition *is* multimodal composition.

At The University of Findlay (UF), we have found that our increasing interest in using digital tools in individual sections of first-year composition means that our exit print- and paper-based portfolio no longer serves as an accurate evaluation tool (if it ever did). Course instructors now use free or low cost applications for smart phones to capture notes on whiteboards and text them to students, students generate Wordles and tag clouds (visual depictions of the varying emphasis of words) for prewriting exercises, narrative essays often take an audio-only form, and argument essays are composed using both the traditional paper essay format and film creation software such as iMovie or Windows MovieMaker.

We have moved to an electronic portfolio within Blackboard course management software to accommodate traditional print texts (submitted as PDFs or Word files) and films, hypertexts, and podcasts. Although Blackboard's portfolio tool allows for easy exchange among teachers and students and appears to solve the limitations of the traditional paper portfolio, use of a course management portfolio for communal assessment has not been theorized, and course management systems in general have their detractors (West, Waddoups, & Graham, 2007; Johnson & DiBiase, 2004). Use of existing course management tools to store, create, exchange, and evaluate exit portfolios might be a transitional phase over the next few years because they exist on most campuses, have a portfolio tool available (albeit with an additional cost in most cases), and students have come to expect their use (Buzzetto-More & Sweat-Guy, 2007). Other writing programs have developed closed, campus-only systems to facilitate communal exchanges of electronic portfolios such as University of Georgia's Emma tool (Desmet, Church Miller, Griffin, Balthazor, & Cummings, 2008) though these systems are also problematic due to high costs of implementation and are also typically closed systems.

I speculate that open source tools and "apps" for cell phones will become more prominent to collect, exchange, and evaluate student compositions, which may result in "the writing program" becoming less of a closed system within a particular university and more of a shared enterprise among colleges and universities. Already we are finding that our own electronic portfolios at UF are limited because we cannot attach our evaluation rubric to the portfolio, so students must get a paper copy of the form and, even though comments can be made by a viewer, audio comments cannot be attached. In addition, we must rely on other free programs such as Moveable Type <http://www.movabletype.org/> to collaborate with students at other universities because course management systems such as Blackboard are closed systems where portfolios can be shared with guests, but class spaces cannot be shared between universities. In a recent collaboration with colleague Suzanne Spring at Colgate University, our upper-level students were able to use Moveable Type to read a common essay, comment back and forth to each other on a common blog, and share video links. I can see this type of open format evolving to contain a student portfolio to be shared beyond the composition program. We can see this type of sharing already beginning to happen for purposes outside of composition as in Cheryl Ball's tenure

and promotion dossier created using WordPress for Illinois State University (available at http://www.ceball.com/) but also available to the public during the time of her review.

This shift to electronic portfolios for exit assessment of first-year composition courses, created and housed both inside and outside of course management systems and specific institutions, has deep implications for writing assessment over the next decade and beyond. Future writing program administrators must consider:

- How does the e-portfolio tool (and all its affiliated corporate or community interests) mediate the contents of the exit portfolio for a composition course?
- What is the best assessment tool to evaluate a composition e-portfolio, and how can the actual assessment tool of the e-portfolio (a rubric, an audio response, etc.) be attached/contained within the e-portfolio?
- Who views the e-portfolio, and who has a right to assess and perhaps even shape its contents? Does communal assessment involve more than just writing faculty?
- Is an exit portfolio even useful in an age of "iterative, collaborative, unfinished-but-always-updatable nature of writing now evident on the Web?" (Day, McClure & Palmquist, 2009).

It may end up that the exit portfolio turns out to be a hopelessly outdated assessment tool and ceases to be a longstanding symbol of first-year composition. It may also be that the portfolio morphs into a tool for ongoing rather than summative assessment, a symbol of a new era in the teaching of composition.

9. Victor J. Vitanza, Clemson

Note from v: There are no typos in this piece. What might look like a typo is not a typo. K?

One: Since as far back as I can remember, I've been obsessed with counting: The first three numbers, 1, 2, 3, have caused a deep anxiety in my everyday ex-istence. As a kid I had this deep angst with "three." After "one" and "two," "three" just looks so odd to me! As best as I've been able to determine, the cause for this angst of 1-2∼3 is the expression "Father, Son, and Holy Ghost." From time to time, the good nuns in elementary school would stop their line of speech, abruptly, and call on one of us to stand and count. Once, I was asked by Sister X to stand and count to ten. I tried but could not get beyond Three. She ex-claimed: "Father, Son, and Holy Ghost! Victor!" While some kids would stammer, I could unjust not get beyond Three. I felt ex-communicated!

It took many years, until adulthood, for me to find some comfort in this dis-ability. I had to see it as a gift! It was *the* magical moment when I found this quote by Kenneth Pike (1982): "In many languages of the world counting has never been developed. In some languages of New Guinea.. people. . . count: *one thing, two things, many things*, and then must stop; one man translated his counting system into Pidgin English for me as *one fellow, two fellow, plenty fellow*" (p. 23; Pike's emphasis). So ever since I read this passage, I've tried to make something productive of my dis-ability, as well as my ex-communication! What I have to say after this pre-ambling is based on my ex-static points of view.

Two: I've conducted research in Web 2.0 (a fiction to be sure), but have moved on to what is coming our way in the unholy name of Web 3.0 (a metafiction to be unsure), and what impact 3 will have on not only me but more so our students and eventually ~~our~~ community without a community. Our inoperativity! (Nancy, 2006). By *wayves* of ex-stasis. On *Facebook* (?).

Darcy DiNucci (1999) was one of the very first to predict what Web 2.0 would feel (disruption) and look (grotesque) like. DiNucci wrote: "The relationship of Web 1.0 to the Web of tomorrow is roughly the equivalence of *Pong* to *The Matrix*" (p. 32). Primarily, DiNucci was concerned with W3 C guidelines for implementing HTML 4.0 to create Web pages—specifically, she made fun of HTML 4.0's <MEDIA> tag: "The lesson is inescapable: Web development—web design, programming, and production—will *split into fragments mirroring the fragmented Web appliance scene*." Why? Because of the variety of communication devices-venues. She thereby declared, "You'd be foolish to use a Palm Pilot interface on a 36" TV screen or to try displaying MTV on a cell phone screen. How can a single web interface possibly suit such disparate devices?" (pp. 32, 221; emphasis added).

And yet, DiNucci predicted: "In the end, way down the line, some set of standards for different devices will probably be developed—say, one for cell phones, another for game machines, and one for household appliances. The process will be long and unpredictable, though—an organic system of mitosis, mutation, and natural selection that we can only regard with wonder" (p. 222). And so, as I see it, such is coming to pass. But DiNucci's supposed-article,

with its dis/content, which can be retrieved from her Web site, has become, nonetheless, represented as an Urban Legend.[2]

DiNucci's reference to "household appliances" reminds me of Avital Ronell's statement: "The death of God has left us with a lot of appliances" (p. 308). So, then the question is, How do we apply ourselves to pure absence filled with appliances? What happens to the Social Contract? More so, what role might the *contrarians* play against the *contractarians*?

Plenty Paranoid Prophets: I am one of the very *plenty* to predict what Web 3.0 would feel-look like. Which is way above and beyond an economy of gifts and experiences. Echoing DiNucci's comparison, I write: The relationship of the so-called Web 2.0 to the Web of tomorrows is crudely the disequilibrium of *The Matrix* to *Terminator I.II.III+*. In passing, while Web 2.0 is supposedly open to programmers-designers and users, Web 3.0 (already a magnificent metafiction) is *determined by machines* (driven by algorithms, which I suspect—way beyond the pleasure principle—are driven by King Thanatos). As the story unfolds about the growth of Web 3.0, as we are reassured, human beings will assist the machines! But what remains in dis/order to resist, as far as I can see, are silly-comparisons! Un.even, perhaps, typographic silly-puns and pronunciations! If so, then, jam the machines! After all has been said and undone, I've become part of *The Dumbest* de*Generation*. Therefore, I will de-generate out of its attempt to re-generate. With silly-contract-language-games.

And yet, I favor acoustical images that are made strange. A foreign language in a host body always acts strange. A foreign intruder. Disfiguring the natural language. When attending Jean-Luc Nancy's seminars, I would smile each time he said, "the boody." Later, I discovered in *Corpus* that he writes: "Nous n'avons pas mis le corps à nu: nous l'avons inventé, et il est la nudité, et il n'y en a pas d'autre, et ce qu'elle est, c'est d'être *plus étrangère* que tous les éstranges corps étrangers" (p. 11; cf. *L'intrus*).

Are we having phun yet?

PREdictions: If we are going the way of urban legends with 2, let's really space-cadet-out and Recall the *appliance* aka Skynet! Yes, Web 3.0 will have become *Terminator III* and Skynet! (We will return to this allusion.) But let us perpetually beware of the unholy Ghost in the machine! Or the conditions for the possibilities of TraumaWeb 3.0. Understand that I do not believe in any possibility beyond III, that is, in *Salvation* history.

But first, we need to see, scholarly, what is being claimed, by others, for Web 3.0. Read this account:

> How Will Web 3.0 Work?
>
> Web 3.0 will be aimed at making web usage to be an increasingly more personal experience for a web user. The information presented to him will be modified according to his specific needs and past searches on the web. The web will be like *a close friend or an assistant who knows enough about you to know what you want*. While this idea seems ludicrous [!], that is one of the goals of Web 3.0. We are already taking steps towards it through social networking sites like Facebook that provide information tailored to a user's expectations.(emphasis added)[3]

This account:

> The main purpose of the **Semantic Web** is driving the evolution of the current Web by allowing users to use it to its full potential thus allowing users to find, share, and combine information more easily. Humans are capable of using the Web to carry out tasks such as finding the Irish word for "folder," reserving a library book, and searching for a low price for a DVD. *However, machines cannot accomplish all of these tasks without human direction, because web pages are designed to be read by people, not machines. The semantic web is a vision of information that can be interpreted by machines, so machines can perform more of the tedious work involved in finding, combining, and acting upon information on the web*. (emphasis added)[4]

This account:

[2] Search on your own to find the scrambled reports. The issue: Who really named what is today called Web 2.0! See, e.g., <http://search-engine-upgrade.com/>. But, cf., *The Fibreculture Journal,* Issue 14 (2009): Web 2.0, collection of articles, "Web 2.0 Is a Doing Word" <http://fourteen.fibreculturejournal.org/>, esp. Geert Lovink's contribution.

[3] See <http://www.buzzle.com/articles/web30.html>.

[4] See <http://en.wikipedia.org/wiki/Semantic_Web>.

> Web 3.0[5]
>
> Definitions of Web 3.0 vary greatly... Focusing on the computer elements, Conrad Wolfram has argued that Web 3.0 is where "the computer is generating new information," rather than humans [generating]...[6] Others still such as Manoj Sharma, an organization strategist, in the keynote "A Brave New World Of Web 3.0" proposes that Web 3.0 will be a "Totally Integrated World"—cradle-to-*grave* experience of being always plugged onto the net. (emphasis added)[7]

Go out t.here, on the Web, your own way, and find Thanatos-over-Eros (Freud, 1955). The drive behind the revenge of the crystal (Baudrillard, 1990). And beware of any libidinal entanglements, attachments! With the machine. I refuse to believe in any *Salvation* history.

Skynet: A fiction or the machine-science of the future (is now)?[8]

REsistance (begins on *Facebook* [?] through mis/representative antidotes)**:** Resistance, aka, *Post-Apocalyptic Pedagogy*! Must struggle against many Skynet Work Campuses.[9]

Okay, here's a case in point.[10] It's called "quickie" or rather Qwiki, <http://www.qwiki.com/>. At this writing it's Beta. What you get for the most part is machine-driven-derived information. Or mis-information. In the form of acoustical images. VVhich we human beings are to improve on. The seduction: Upon first visiting the Qwiki, you are asked to put in your email address (your ID). Then, be further seduced.

Dumb-Dummer-DumBest: as proven on *Facebook*:

Victor J. Vitanza, with re:mixed feelings

:/: vvell, "qwiki.com" is so/w courting me! Seducing me! I can't say anymore. But Quickie is the "sign" of Web 3.0. Which I'm writing an article... a.bout.. Oh, my gods: the scandals to befall us all... with the rebeginning of the *trois*. Will people believe! On the way to *Ménage à trois*!.. This is the ebb and flow of the Web. M.ark my words! There is nothing beyond *trios*, for human-beings. Certainly not with a machine. Though I do remember *Barbarella* in the Excessive Machine (aka, Orgamatron). After which, Barbarella would humhumhum.

Henry Warwick

qwiki.com FAIL.

type in auschwitz, and listen to a cheerleader zoned on prozac tell you about auschwitz eye and two, and... oh, it's just horrible.

Victor J. Vitanza

:/: The robotic chick who's doing the talkin' pronounces the (my) journal ~PRE/TEXT~ AS –> PRE/VERT <–.. ! I sent a note for an adjustment in the pro-nun-ciation. Perhaps.. But she does not hum!

Victor J. Vitanza

:/: Actually, to tell the truth of the matter, I suggested ~PURR/VERT~ ! To hear her at least purrpurrpurr. Ing.

Eventually, more and more machines with *a'more* in-humans will be attempting to help the qwiki.com, say, with its pronunciation, often a stammer or quirky Annunciation. We must resist by perverted e-nunications. Otherwise..

To be dis/continued: When the machines take over—annihilating human beings—the remaining question will be "Can Thought go on Without a Body?" (Lyotard, 1991). "Boody."

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[5] See <http://en.wikipedia.org/wiki/Web_2.0#Web_3.0>.

[6] Interview, Conrad Wolfram <http://www.itpro.co.uk/621535/q-a-conrad-wolfram-on-communicating-with-apps-in-web-3-0>.

[7] Manoj Sharma <http://www.manojsharma.com/keynotes/the-brave-new-world-of-web-3-0-the-next-big-thing-its-integrative-impact-on-the-world-governments-businesses-society-you/>.

[8] See Skynet <http://www.goingfaster.com/term2029/skynet.html>.

[9] See Resistance <http://terminator.wikia.com/wiki/Resistance>.

[10] Taken from *Facebook*, aka *FiB*, discussions, some virtual-actual and *some a'more*.

References

Anderson, Daniel. (2008). The low bridge to high benefits: Entry-level multimedia, literacies, and motivation. *Computers and Composition*, *25*(1), 40–60.

Anderson, Daniel, Atkins, Anthony, Ball, Cheryl, Millar, Krista Homicz, Selfe, Cynthia & Selfe, Richard. (2006). Integrating multimodality into composition curricula: Survey methodology and results from a CCCC Research Grant. *Composition Studies*, *34*(2), 59–84.

Arola, Kristen L. (2010). The design of Web 2.0: The rise of the template, the fall of design. *Computers and Composition*, *27*(1), 4–14.

Ball, Cheryl E. (2010). Goldilocks and the three (or four) digital scholarship books; or, reconceptualizing a role for digital media scholarship in an age of digital scholarship: A review webtext. *Kairos: A Journal of Rhetoric, Technology, and Pedagogy, 15*(1). Retrieved from http://technorhetoric.com/15.1/reviews/ball/index.html.

Ball, Cheryl E., & Moeller, Ryan M. (2008). Converging the ASS[umptions] between U and ME; or how new media can bridge a scholarly/creative split in English studies. *Computers and Composition Online*. Retrieved from http://www.bgsu.edu/cconline/convergence/media/convergence-FINAL.pdf.

Barbarella: Queen of the Galaxy. (1968). Director, Roger Vadim. Dino de Laurentiis Cinematografica. Paramount. DVD.

Baudrillard, Jean. (1990). *Revenge of the crystal*. London: Pluto Press.

Berners-Lee, Tim. (1989). *Information management: A proposal*. Geneva: CERN. Retrieved from http://info.cern.ch/Proposal.html

Blair, Kristine, & Monske, Elizabeth. (2003). Cui bono? Revisiting the promises and perils of online learning. *Computers and Composition*, *20*(4), 441–453.

Blair, Kristine & Hoy, Cheryl. (2006). Paying attention to adult learners online. *Computers and Composition*, *23*(1), 32–48.

Blum, Susan D. (2009). *My word! Plagiarism and college culture*. Ithaca, NY: Cornell University Press.

Buzzetto-More, Nicole, & Sweat-Guy, Robert. (2007). Digital natives: Exploring the technology experiences and uses of the millennium generation. *Journal of Global Information Technology*, *1*(12), 78–87.

Day, Michael, McClure, Randall, & Palmquist, Michael (2009). Composition in the freeware age: Assessing the impact and value of the Web 2.0 Movement in the teaching of writing. *Computers and Composition Online*. Retrieved from http://www.bgsu.edu/cconline/Ed_Welcome_Fall_09/compinfreewareintroduction.htm.

Desmet, Christy, Church Miller, Deborah, Griffin, June, Balthazor, Ron, & Cummings, Robert E. (2008). Reflection, revision, and assessment in first-year composition e-portfolios. *Journal of General Education*, *57*(1), 15–30.

DeVoss, Dánielle Nicole, Eideman-Aadahl, Elyse, & Hicks G Troy. (2010). *Because digital writing matters: Improving student writing in online and multimedia environments*. San Francisco, CA: Jossey-Bass.

DiNucci, Darcy (1999, April). Fragmented future. *Design & New Media, 53*(4), 221-222. Retrieved from http://www.tothepoint.com/index.html.

Dourish, Paul. (2001). *Where the action is: The foundations of embodied interaction*. Cambridge, MA: MIT Press.

Eisenstein, Elizabeth L. (1980). *The printing press as an agent of social change*. Cambridge: Cambridge University Press.

Eng, Joseph (2006). Embracing the exit: Assessment, trust, and the teaching of writing. *Composition Forum, 16*. Retrieved 30 Aug. 2009 from http://compositionforum.com/issue/16/embracing-exit.php.

Feller, Joseph (n.d.) The Web as platform: What does it mean? Retrieved from http://www.cutter.com/content-and-analysis/resource-centers/business-technology-trends/sample-our-research/bttu0902.html.

Freud, Sigmund. (1955). *Beyond the pleasure principle. The standard edition* London: The Hogarth Press., pp. 7–66

Grabill, Jeff, Pigg, Stacey, et al. (2010). *The writing lives of college students*. East Lansing, MI: Writing in Digital Environments Research Center. Retrieved from http://compositionawebb.pbworks.com/f/whitepaper.pdf

Hall, Gary. (2008). *Digitize this book!: The politics of new media, or why we need open access now*. Minneapolis: University of Minnesota Press.

Hargittai, Eszter, Fullerton, Lindsay, Menchen-Trevino, Ericka, & Thomas, Kristin Yates. (2010). Trust online: Young adults' evaluation of Web content. *International Journal of Communication*, *4*, 468–494.

Hawisher, Gail E., & Selfe, Cynthia L. (Eds.). (1991). *Evolving perspectives on computers and composition studies: Questions for the 1990s*. Urbana: NCTE.

Head, Alison J. (2007). Beyond Google: How do students conduct academic research? *First Monday*, *12*(8). Retrieved from http://firstmonday.org/issues/issue12_8/head/index.html.

Johnson, Glenn, & DiBiase, David. (2004). Keeping the cart before the horse: Penn State's E-Portfolio Initiative. *Educause Quarterly*, *4*, 18–26.

Johnson-Eilola, Johndan. (2001). Little Machines: Understanding users understanding interfaces. *ACM Journal of Computer Documentation*, *25*(4), 119–127.

Kelly, Kevin. (2010, September 16). Achieving techno-literacy. *The New York Times Magazine*. Retrieved from http://www.nytimes.com/2010/09/19/magazine/19FOB-WWLN-Kelly-t.html.

Koehler, Matthew. J., & Mishra, Punya. (2002). Art from randomness: How *Inverso* uses chance to create haiku. *Interactive Multimedia Journal of Computer-Enhanced Learning*, *4*(1). Retrieved from http://imej.wfu.edu/articles/2002/1/03/index.asp

Kress, Gunther. (1998). Visual and verbal modes of representation in electronically mediated communication: The potentials of new forms of text. In Ilana Snyder (Ed.), *Page to screen: Taking literacy into the electronic age* (pp. 53–79). London: Routledge.

Lanham, Richard A. (2006). *The economics of attention: Style and Substance in the age of information*. Chicago: The University of Chicago Press.

Lenhart, Amanda, Purcell, Kristen, Smith, Aaron, & Zickuhr, Kathryn (2010). Social media and mobile Internet use among teens and young adults. *Pew Internet and American Life Project*. Retrieved from http://pewinternet.org/~/media//Files/Reports/2010/PIP_Social_Media_and_Young_Adults_Report_Final_with_toplines.pdf.

Lenhart, Amanda, Arafeh, Sousan, Smith, Aaron, & Magill, Alexandra Rankin (2008). Writing, technology, and teens. *Pew Internet and American Life Project*. Retrieved from http://www.pewinternet.org/pdfs/PIP_Writing_Report_FINAL3.pdf.

Lyotard, Jean-François. (1991). Can thought go on without a body? *The Inhuman* (pp. 8-23). Trans. Geoffrey Bennington and Rachel Bowlby. Stanford, California: Stanford University Press.

Miller, Carolyn. (1984). Genre as social action. *Quarterly Journal of Speech*, *70*, 151–176.

Nancy, Jean-Luc. (2006). *Corpus*. Paris: Éditions Métailié.

Negroponte, Nicholas. (1996). *Being Digital*. New York: Vingate Books.

Palmquist, Mike (2003, March 19). New venues for academic publishing: From cooperative publishing ventures to collaborative Web sites. Plenary Presentation, Research Network Forum. Presented at the Conference on College Composition and Communication, New York.

Palmquist, Mike, Kiefer, Kate, & Salahub, Jill (2009). Sustaining (and growing) a pedagogical writing environment: An activity theory analysis. In Dànielle Nicole DeVoss, Heidi A. McKee, & Richard (Dickie) Selfe (Eds.), *Technological ecologies and sustainability*. Logan, Utah: Computers and Composition Digital Press. Available at http://ccdigitalpress.org/tes/13_palmquist_kiefer_salahub.pdf.

Palmquist, Mike, Mullin, Joan, & Blalock, Glenn. (2011). The role of activity analysis in writing research: Case studies of emerging scholarly communities. In Lee Nickoson, & Mary P. Sheridan-Rabideau (Eds.), *Pragmatics, problematics, and possibilities: Reflections on contemporary writing research*. Logan, Utah: Utah State University Press.

Pike, Kenneth. (1982). *Linguistic concepts*. Lincoln: University of Nebraska Press.

Prensky, Marc. (2001). Digital natives, digital immigrants. *On the Horizon*, *9*(5), 1–6.

Prensky, Marc. (2010). *Teaching digital natives: Partnering for real learning*. Thousand Oaks, CA: Corwin Press.

Purdy, James P. (under review). Scholarliness as other: How students explain their research-writing behaviors. *Millennials and the academy: Exploring and enriching the research and writing practices of NextGen students*.

Purdy, James P., & Walker, Joyce R. (forthcoming). Scholarship on the move: A rhetorical analysis of scholarly activity in digital spaces. In Debra Journet, Cheryl E. Ball, & Ryan Trauman (Eds.), *The new work of composing*. Logan, UT: Computers and Composition Digital Press and Utah State University Press.

Purdy, James P., & Walker, Joyce R. (2010). Valuing digital scholarship: Exploring the changing realities of intellectual work. *Profession*, 177–195.

Ronell, Avital. (1994). *Finitude's score: Essays for the end of the millennium*. Lincoln: University of Nebraska Press.

Schryer, Catherine. (1993). Records as genre. *Written Communication*, *10*, 200–234.

Selber, Stuart. (2009). Institutional dimensions of academic computing. *College Composition and Communication*, *61*(1), 10–34.

Selfe, Cynthia. (2004). Students who teach us. In Anne Wysocki, Johndan Johnson-Eilola, Cynthia L. Selfe, & Geoffrey Sirc (Eds.), *Writing new media: Theory and applications for expanding the teaching of composition* (pp. 43–66). Logan, UT: Utah State University Press.

Shirky, Clay. (2010). *Cognitive surplus: Creativity and generosity in a connected age*. New York: Penguin Press.

Slatin, John M. (2001). The art of ALT: Toward a more accessible Web. *Computers and Composition*, *18*, 73–81.

Tenopir, Carol, & King, Donald W. (2008). Electronic journals and changes in scholarly article seeking and reading patterns. *D-Lib, 14*(11/12). doi:10.1045/november2008-tenopir. Retrieved from http://www.dlib.org/dlib/november08/tenopir/11tenopir.html.

Terminator III. *Rise of the Machines*. (2003). Director, Jonathan Mostow. Warner Brothers. DVD.

West, Richard E., Waddoups, Greg, & Graham, Charles Rise of the Machines. (2003). Direct (2007). Understanding the experiences of instructors as they adopt a course management system. *Education Technology, Research & Development, 55*(1), 1-26.

Zdenek, Sean (2009). Accessible podcasting: College students on the margins in the new media classroom. *Computers and Composition Online*. Special issue on Composition in the freeware age: Assessing the impact and value of the Web 2.0 movement in the teaching of writing. Retrieved from http://seanzdenek.com/?page_id=22.