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Assessing the Intersections of Rhetorics, Technologies, and Bodies

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Introduction: Assumptions

In 1991, as Apple and Microsoft were continuing their strides with technological development (Mac Quandra 900 with a super floppy drive, Microsoft Windows was released the year before), and the release of the follow-up James Cameron film of organic machines, *Terminator 2*, the concept of the *cyborg* entered academic discussions. Largely due to feminist scholar Donna Haraway's 1991 publication on the "Cyborg Manifesto," the academic discussion encouraged researchers of language and rhetoric to seriously consider how technology influenced not only teaching and learning, but the identity of teachers and students who used technology in academic settings. Haraway described the cyborg as "… a cybernetic organism, a hybrid of machine and organism, a creature of social reality as well as a creature of fiction. Social reality is lived social relations, our most important political construction, a world-changing fiction" (Haraway, p. 149). Haraway explained that we are all cyborgs—part human, part machine. When we—the authors—were first introduced to this concept, we thought not only of Arnold Schwarzenegger in Ray-Bans, but also of our use of cars, pens, pencils, typewriters, computers, radios, and credit cards. We thought of relatives in wheelchairs. We thought of war veterans with artificial limbs. We accepted Haraway's theory as pointing out the obvious. She gave language back in the early nineties to what it meant to be a feminist who is also interested in technology, and she contributed to our own beliefs and research that dualistic thinking, the "difference between natural and artificial, mind and body, self-developing and externally designed" (p. 152) was mostly simplistic and naïve.

Now, fifteen years later, we revisited Donna Haraway's work for the purpose of historical hindsight and contemporary discussions. As we observe our own students' use of technology,

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technologies and bodies have become even more connected. Most of our students are "connected" with iPod armbands, Bluetooth headsets, cell phones, digital cameras, and laptops with wireless internet access. At our institution, we find that this materialistic technological trend cuts across ethnic and economic differences although iPods might not be as new or powerful, and cell phones might be 2 years old if students come from economically disadvantaged backgrounds. Our students' disciplines also have become and continue to develop their body of knowledge because of technological developments. For our pre-medical students, uses of new technologies to find cures for cancer and AIDS created new possibilities for medical study. AIDS patients, our students tell us, now commonly have medical cocktails that offer hope and a chance for survival. Our mechanical engineering students learn about electric and hybrid cars as part of their curriculum while the environmental science majors learn that the very same technologies might help decrease greenhouse gas emissions.

On a less uplifting note, our environmental science students show us in their presentations that we have used technologies to pollute the planet in almost irreversible ways. Paired with economic prosperity in some countries, and the desire to become major players in the world-economic arena, political science majors argue that increased technology use has also increased exploitation. We usually don't examine in our everyday lives—although we claim we are sensitive to these issues—in what ways our economic positions, our gender, our race, our nationality, and our age impact our uses of technologies in our lives.

Although our research, surveys, and informal observations tell us that many of our students use computers and other technologies in their daily lives, we have found that we often pay little attention to what technological skills our students bring to the classroom. In fact, it is ordinary to see students on their cell phones when they walk from one class to another class. It is

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ordinary to see them with their iPods and MP3 players. It is ordinary to see them sending a text message to a friend or playing a computer game. We see our students' technological literacy behaviors as ordinary when in many cases they are extraordinary and complex; yet we often lack wonder, as Iris Marion Young (1997) reminds us, and we hardly ask why and for what purposes our technology-enhanced students (cyborgs) use their cell phones, iPods, or computers. At the same time, while we agree that our students seem technologically savvy, we also often notice that they do not exhibit critical and analytical technological literacy skills. We argue that while our students may be able to play computer games with players from other countries, they seem to research another country's political and social situation only superfluously, taking the easy route of Wikipedia and trusting all websites that come up on a google search. Students talk to their friends on their cell phones and seem to manage many activities between classes, but their reasons for late papers are similar to our own undergraduate excuses when we left hand-written notes on windshields. Every time we decided to take on our students, we realized that our understanding of student behaviors did not allow us to move beyond commonly held assumptions about what students know and what they don't know.

In this paper, we provide a starting point for moving beyond assumptions about our students' technological and critical literacy skills, and beyond assumptions of dualistic thinking that we find is still prevalent in many classrooms. We use examples from two hybrid classes—taught partially online and partially face-to-face—to explore the impact of technologies on student learning and student literacy and identity development. We show that students in our classrooms are comfortable with embracing the functionality of computer technologies, a functionality that is often defined differently by teachers and students. We show that our students are, however, uncertain about transferring their technological literacy skills to a new

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environment, especially if this environment is considerably different from the environment in which they explore and experiment with technology on a daily basis. Our student-cyborgs seem much more adept with the latest technologies than the teacher-cyborgs, but like the generations before them, they too become largely creatures of habit. Our discussion includes a preliminary model for articulating cyborg behaviors in the 21st century loosely based on Stuart Selber's (2004) technological literacy concept in *Multiliteracies for a Digital Age,* and Beverly Tatum's (1992) discussion of racial identity development in *Why Are All the Black Kids Sitting Together in the Cafeteria*? Our purpose is to move away from looking at technological literacy development as a linear and well-defined process so often implied in current literature and also experienced in our own courses (students start as functionally literate users and then move on to become critically literate users, ending up as rhetorical users of technology). We add, by showing the dilemma we faced in our courses, and by outlining our understanding of the stages of digital identity and literacy development, that acquiring technological literacy is a complex process that often repeats itself, moves in circles or spirals, with technology users often defying easy categorization and instead becoming cyborgs of their own making.

We chose Selber's and Tatum's theoretical frameworks to show that the development of a multiliterate approach to technology and the development of a complex understanding of race, gender, and class issues are more closely connected than current research has provided. In some ways, we took our cues from Haraway (1990) who, in discussing the concept of "cyborg," compared it to discussions of *women of color*. Both discussions, she points out, mark out "a self-consciously constructed space that cannot affirm the capacity to act on the basis of natural identification, but only on the basis of conscious coalition, of affinity, of political kinship" (p. 156). We wanted to create such affinity and kinship in our discussions by creating a concept for

looking at technological literacy that incorporates theories not necessarily associated with research on digital and visual literacy. Incorporating racial identity theory, and acknowledging unlikely connections, will provide researchers interested in students' technological literacy development with a new perspective that might lead to new developments and new ways of approaching student identity development and technological literacy development. Contemporary realities show us that neither one exists in isolation, but that identity and technology are closely and inextricably connected. We have seen that students bring with them a multitude of experiences and a multitude of technological literacies that move beyond the often one-dimensional characteristics of the 21st century student defined for us by current research on the new technology-savvy students coming to our classrooms (Mark Taylor, 2006; Diana and James Oblinger, 2006). Our proposed stages of digital identity and literacy development show that we do not have to categorize students as easily defined entities, and we don't have to measure our successes or failures by students' achievement of the lofty and ill-articulated goals—such as getting students ready for the technological challenges of the twenty-first century—that academic institutions often set for themselves; instead, we can provide students with opportunities to develop their technological literacy identities without measuring our own success as teachers, but by measuring students' success in their complex development as users of new technologies.

Technological Literacy in Educational Settings

Much of the research over the past two decades on using computers in the writing classroom has centered on increased student involvement in class discussions, academic improvement, personal growth, collaborative potentials, social ramifications, ethical

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implications, and implications for gender, race, and class issues (Selfe, 1987; LeBlanc, 1990; George, 1990; Takayoshi, 1994, 1999; Grigar, 1999; Duffelmeyer, 2000; Gruber, 2007). The conclusions have often been that technology is a helpful tool that provides an opportunity for students to communicate and interact more productively, discuss issues that might not be addressed in face-to-face class meetings, and gain more confidence as social human beings. Students, in other words, can develop and sharpen their critical literacy skills by utilizing computer technologies in productive and non-hierarchical ways.

Although we know that technology itself does not enhance the learning environment for our students, and although we know that technology itself does not provide a more equitable, collaborative, non-authoritarian medium for student-teacher interactions (Todd Taylor, 1998), we often hope that we will be able to use computer technologies—like other pedagogical tools—to provide students with a stimulating and positive educational experience and to make sure that students become critical consumers, viewers, and users of technology. We usually don't acknowledge that they already might be able to think critically and analytically about various aspects of technology, including computer technology. They might have grown up in neighborhoods where computer access was a given, and where computers in schools were used to enhance teaching practices. They might have more negative experiences because computers in their schools were outdated and computer use was restricted to the "smart" or college-bound students, often leading to discriminatory practices based on race, gender, and class. And, they might have experienced the need to look critically at the web to find reliable information on a health issue, or they might have participated in gaming that requires analytical skills (Gee, 2004).

Our interest in exploring how already acquired technological literacy skills can be transferred to an academic setting, and how discussions about technological literacy can be

incorporated successfully into the classroom, encouraged us to explore hybrid course modules for the undergraduate and graduate courses we taught. We considered it important to use technology as a means to help students interact and communicate with each other. We were hopeful that hybridity would allow students to understand how digital literacy influences the content as well as the context of teaching diversity, cultures, and technology. As Peter Sands (2002) argues, "the hybrid model opens the possibility of rigorous and sustained efforts to acknowledge both institutional necessities and to create more equitable, distributed, non-hierarchical interactions."

Furthermore, our past research and our past experiences in the classroom led us to believe that collaboration during face-to-face meetings, online discussions, and multimedia presentations would increase student awareness of the effects of hybridity on literacy development and identity formation. In other words, with the intersections of real and virtual student meetings, we hoped that students would see technology as a tool that can be used to provide information, manipulate audiences, or question existing social and cultural paradigms. Thus, we projected that students would no longer consider technology "as a force in its own right, one that shapes today's societies and values from the ground up and has no serious rivals" (Borgmann, 1984, p. 9), but instead as a more ambiguous and more complex tool that can hinder as well as enhance communication. We assumed that students would be able to transfer their analytical and critical skills from discussions of texts to discussions of technology because we fully intended to tell them to do so. With these expectations, based on research we had conducted, we implicitly anticipated that students would move beyond dualistic thinking and would understand their role in participating in a community that embraces multifaceted realities.

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Definitions

Before we taught our classes, we wanted to make sure that we defined technological literacy not only for us but also for our students. Otherwise, discussions about technological literacy can become a matter of misunderstanding and miscommunication. We wanted to make students aware that technological literacy, in the broadest sense, can be seen as "one's ability to use, manage, assess, and understand technology." [http://perso.wanadoo.es/losans/n003/arti00304.pdf]. The International Technology Education Association (ITEA) used this definition as the basis for a 2001 survey in which they found that the public widely accepts the importance of technological literacy in everybody's life. The study's major findings were:

- The American public is virtually unanimous in regarding the development of technological literacy as an important goal for people at all levels.
- Many Americans view technology narrowly as mostly being computers and the Internet.
- There is near total consensus in the public sampled that schools should include the study of technology in the curriculum. [http://perso.wanadoo.es/losans/n003/arti00304.pdf]

It is not clear from the definition of technological literacy and from the major findings whether an "understanding" of technology refers to the functional skills necessary to improve job performance or whether the definition used by ITEA sees technological literacy also as a "cultural phenomena" (Selfe, 1999). According to Selfe, expanding the definition of technological literacy to include "a complex set of socially and culturally situated values, practices, and skills involved in operating linguistically within the context of electronic environments" (p. 11) moves us toward a better understanding of how technology impacts job

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performance, educational environments, or political actions.

Although we strongly agree with Selfe's definition of technological literacy, and with Selber's concept that students need to be exposed to and understand functional as well as critical and rhetorical technological literacy, we are aware that many schools are almost exclusively interested in providing students with quantifiable, mostly functional, technological literacy skills. For example, our home institution defines technological literacy as being proficient in keyboarding, word processing, course management, hardware and software basics, data management, spreadsheets, web page authoring, electronic communication, and presentations that are properly formatted. Students are also asked to collaborate electronically in a group environment using email services and Internet technologies, and to understand the ethical use of computing, software, and Internet technologies. Although any of the skills addressed in the list of proficiencies could be explored from a critical standpoint, students are not asked or encouraged to look at the "complex sets of cultural beliefs and values" (Selfe, 1999, p. 12) that influence the use of computers in educational or workplace settings. Instead, our institution, one of the largest distance education providers in Arizona (approximately 7,000 students are virtual students), largely focuses on increasing students' functional computer skills. In our hybrid course modules—taught on campus and online, however, we expected students to think beyond their comfort zones and the comfort zone of the institution. We wanted students to transfer the analytical literacy skills they acquired for reading print texts and understand technology not only as functional but also as a culturally, politically, and socially defined entity. We were prepared to move our students along from learning "how to" to "why is," or so we believed.

Preliminary Ideas: When Practices Show Unwanted Realities

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When we decided to collaboratively teach an undergraduate capstone seminar and an introductory graduate course in rhetoric and composition studies, we asked ourselves a number of questions: How can we integrate functional, critical, and rhetorical technological literacy into our curriculum? Why do we want to establish a cross-curricular collaboration between undergraduate and graduate students? What modes of communication could encourage our students to learn from each other? What course structure would be appropriate for both sets of students? What assignments could students share? And, what assumptions are we making about our students and their technological literacy skills?

We considered it especially important to discuss digital literacy in the context of rhetorical skills that we expected from our students by the last year of their undergraduate career or their first year of their graduate career. We designed both courses to emphasize issues of class, gender, race, ethnicity, environment, and technological access through readings and online exercises. Specifically, we wanted students to examine the ways rhetoric structures, supports, and sustains particular discourse communities. We wanted for our students to discuss the foundations of literate practices in different communities, and we wanted them to explore the rhetorics of class, gender, race, ethnicity, environment, and technological access in educational institutions, political, socio-economic, and environmental communities. In order to promote a critical understanding of discursive practices in various communities, we wanted them to study the conventions of dominant and marginalized ideologies. We focused on developing an understanding of rhetorical features and their underlying belief systems, an awareness of competing rhetorics and their influences in and outside the academy, and an ability to participate effectively in different discourse communities using different modes of communication. Our

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syllabus included Northern Arizona University's archives of the Colorado Plateau. The archival materials incorporated audio, photos, video, scanned handwritten letters, and bins of actual hard-copy letters, journals, photos, and artifacts of historical local individuals and groups. Students were given a tour and knew they needed to set up appointments to have access to the archived information.

Students in our classes came from a wide variety of ethnic and cultural backgrounds. Many of them were working-class and first-generation college attendees, but all of them were familiar with academic requirements. They had also used computers for academic purposes although some of the graduate students had been away from academia for several years. In other words, students' familiarity with technology was varied, but some students were less comfortable with using technology for classroom interactions and with analyzing digital media. Furthermore, the production skills of students varied widely among the group we taught. Although challenging, we saw our course collaboration as an asset to all students, encouraging them to learn in a variety of environments and from a variety of sources. We thought that the various communication and interaction methods we chose, in connection with the topics addressed and assignments included in the course, would promote student awareness of the various roles of digital media in their own lives as well as in local, state, national, and global communities. Course-specific and cross-course face-to-face discussions and interactions were intended to create a face-to-face community for each class and between classes to ensure that students could get to know each other in the face-to-face classroom. We hoped that cross-class interactions would provide students with different audiences where they would receive and provide feedback on various interpretations of readings, and where they would also be able to work with each other on collaborative projects. Additionally, course-specific and cross-course online discussions

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were intended to provide students with an opportunity to interact in an online community which we hoped would be collaborative and conducive to productive interactions. We wanted to create an online environment that would encourage students to participate in non-threatening, non-authoritarian interactions that would complement and expand face-to-face interactions.

To underscore the importance of context and critical analysis in any situation, we asked students to read articles on language and ideology (such as Dicker, Lippi-Green, Anzaldua), representations of Self and Other (such as Hall and Bailey), on racial identity development theory (such as Tatum and Young), and on identity and community activism (such as Chavez, Stanton, King, Kennedy). With this course emphasis, we wanted to encourage students to focus primarily on the texts they read while also thinking about the contexts in which they communicated their understanding of the readings to their classmates. Did they discuss texts more freely in face-to-face meetings or during online discussions? Did the context of the discussion tool change the message? In other words, how did the hybrid course structure problematize their understanding of the texts, their understanding of how to interact with the texts, their understanding of how to interact with each other, and their understanding of themselves as readers, writers, and individuals participating in face-to-face and online communities?

In addition to discussing and analyzing texts, we asked students to discuss their comfort and use of digital media as well as the impact of digital media on identity. This discussion was a continuation of face-to-face introductions in which many students mentioned their ethnic backgrounds, but they also pointed out that they did not consider their background as important identifiers of who they were. One student pointed out that because of his looks, and because his father was Latino, he is often categorized as Latino, but that in reality he is far removed from his

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Latino heritage and that he was brought up in a small Southwestern town by his Anglo mother. Another student talked about his Irish roots and only considered it important in connection to his proclivity for drinking. Because both classes focused on culture and identity, and how identity is shaped and formed by digital media, we considered an initial question on identity and digital media as an important starting point in students' digital identity and literacy development. Student responses in this online forum focused largely on the limitations of identifying themselves online and repeatedly addressed the dehumanizing effects of technology, the one-dimensional nature of online interactions, and the limitations of technology on human interactions.

> "Online chatter through text on a computer screen is so very difficult. The limitations I feel outweigh the advantages. By typing up my personal business, I subject myself to criticism and biased attitudes by those who read this. Perhaps a person with a similar situation as mine might not feel the same way as I do. Real time conversation is more effective rather than online discussion. Going online prohibits real emotion and feeling in the nature of what the writer is trying to stress. Likewise, you are outting yourself on the spot online, therefore subjecting yourself to criticism and biased opinions." (Student A)

> "The most difficult obstacle of identifying yourself online is that I'm not there to correct an incorrect assumption someone makes about me. If I am not careful with what information I might divulge, someone might take it the wrong way. Who is there to make them understand what I really mean? I can't take back what I write once I click "post." (Student B)

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We were surprised that students' concerns centered around a substantivist position (Borgmann, 1984, p. 9) where technology becomes an almost destructive instrument that does not allow us to define ourselves but which defines us despite our best intentions. Students, in response to our first set of questions were certainly critical of technology; however, we are not convinced that their criticism was based on a critical examination of technology's cultural, social, political, or economic influences on human interactions. Instead, their criticism seemed to derive from an I-centered fear that neglects to look at the larger impact of technology use.

When we moved from questions about identity to questions about how they influence technology and how technology influences them and their interactions with others, we were surprised that their answers addressed aspects of technology that seemed to conflict with their previous responses to digital identity. Specifically, although students were dubious about the powers and limitations of technology as it affected their identity, they were largely convinced that technology is an inevitable part of human interactions. As they pointed out, technology is functional, convenient, and it's expected that you know it:

> "There is a great deal of pressure on my generation to be very knowledgeable about computers. Essentially, without a working knowledge of technology you won't be able to function in the workplace. I am expecting to have a higher paying and more fulfilling job because of my technological skills." (Student D).

> "I am not a revolutionary and I am conservative when it comes to technological use. I use cell phones for phone calls. I use stereos for music. I use computers for typing and printing. However, I do realize that I am incredibly bound to technology and can't live

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without it" (Student G).

Students did not seem to make a connection between the first and second set of questions. Instead, technology use became a functional skill devoid of any values beyond a well-paying job. Despite their fears of misrepresentation online, students throughout the course were comfortable using technology. However, they were not yet ready to discuss the impact of technology on language and literacy development or on identity formation. In essence, students were comfortable with seeing technology as a "force in its own right" (Borgmann, 1984), and they were hardly concerned with the implications of technology use on the larger cultural, social, and political realm. Our repeated questions about the impact of ready-to-use software they used repeatedly (MSWord, MSPowerPoint, Netscape Composer, Dreamweaver, InDesign, and others), our discussions on students' choices for visual and audio materials for their final project, and our general attempts to discuss the implications of technology on identity construction were mostly disregarded.

We could easily assume that students were unfamiliar with discussing the impact of culture and rhetoric on identity. However, students were ready and willing to address issues of identity and diversity in face-to-face discussions. They heatedly discussed the implications of Hall's comments on the representation of the other; they addressed the impact of consumer culture on farm workers; and they were ready to admit and condemn their contributions to the increase in oil consumption. But, they hardly took a critical stance on the implications of technology, identity issues, and online environments. Technology remained an outside force and was hardly questioned. Instead, students saw computer technology as a tool that needed to be learned because technology skills were expected at the university and in the workforce.

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This tendency to "accept the inevitable" became especially apparent in students' digital media projects which we intended as the final step in students' digital identity and literacy development. Now they would be able to apply the theories from the readings and discussions to their own work. They would be producers of digital media, and they would be able to apply their critical and analytical skills to projects that would underscore the course theme and address the impact of class, gender, race, ethnicity, environment, and technological access on community interaction and development. Furthermore, this project was intended to help students think critically about the different ways that groups are defined through images, sounds, and language. The projects, from a teacher's perspective, barely met the minimum technological literacy requirements outlined by Stuart Selber. For example, although students had access to a variety of programs, and although we provided workshops for them to become familiar with new programs, thus increasing their functional technological literacy, most students did not take advantage of learning new programs. They did not want to "confront the complexities associated with computer use" (Selber, p.31), and instead wanted to finish a project by using what they already knew. Furthermore, students did not exhibit much willingness to question technology or "technological regularization" (128), as pointed out by Stuart Selber. Instead, if PowerPoint was readily available, students used the program, even though it limited them in their presentation of the material they incorporated into the project. Additionally, students' rhetorical literacy skills, which Selber defines as "the thoughtful integration of functional and critical abilities in the design and evaluation of computer interfaces" (145), hardly came into play in the final projects. Only a few students thought carefully about how their use of technology influenced their depiction of the groups they chose to represent.

As teachers, we almost considered the assignment a failure. We were concerned that

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students had not become more independent technology users. We weren't even sure whether they had become more functionally literate, or whether they had already come into the classroom with the skills they used for their final projects. We also questioned why we wanted to provide students with analytical and critical use and production skills when job requirements often focus on the functional and discourage discussion of the critical? What we needed to pay more attention to, we realized, is how we define success and failure in our teaching, especially when we know that developing technological literacy skills is a process that is never complete. It is also a process that is not easily categorized but that depends on students' previous experiences and future goals. The responses we received from students, then, allowed us to look to a new approach that would hopefully minimize the experiences we had in our classroom.

The framework we propose in the following section is an initial step to guide us in understanding the many different places that we, and our students, can be in our technological literacy development. Instead of seeing specific student behavior as "failure," our proposed framework is intended to help teachers and students to understand that technological literacy development is a complex process that does not follow a straightforward path but instead needs to be adapted to the goals and purposes of individuals living within specific political, social, historical, and cultural constraints.

Framework: Using Theories to Lead to Wanted Practices

Although our students were happy with acquiring functional skills, we do believe that technological uses have implications beyond the functional. We started to think about "stages of technological literacy development" when we first discussed Albert Borgmann's (1984) ideas of moving from techno-enthusiasm on the one hand and technophobia on the other extreme, to a

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more pluralistic approach to technology. Furthermore, Stuart Selber's (2004) well-defined approach to multiliteracies in a digital age showed us the need to address students' multiliteracies from the perspective of teachers who are interested in how students use technologies in their educational and work lives. Selber focuses on the importance of providing students with functional, critical, as well as rhetorical technological literacy skills, emphasizing that rhetorical technological literacy would provide students with the necessary tools to move from consumers of technology to active and critical users of technology as well as producers of digital media who approach technology from a humanistic perspective. According to Selber, such a perspective values "justice, equality, civic action, public service, and social responsibility," which must become part of our thinking as educators in a time of unequal access to civic participation, educational development, and economic advancement (p. 86).

Selber's approach—similar to Donna Haraway's (1991) initial discussion of the intersections of human and machine and her argument against simplifying complex issues—pushed us to think about the implications of technological literacy on students' identity development, and it forced us to think about how intricately connected identity development and technological literacy development often are. Haraway's argument that "no construction is whole" (p. 157), and Selber's emphasis on humanistic values and reflective practices are a first step to move discussions of technological literacies to the complexities, circularities, difficulties, and intricacies of an approach that combines technology and identity into a model of technological identity and literacy development.

We found Beverly Tatum's (1992) discussion of racial identity development (using William Cross's concepts) helpful in providing a basis for our discussion of the stages of digital literacy

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and identity development. Tatum shows very convincingly that we move through various stages of racial identity development. She defines them as pre-encounter, encounter, immersion/emersion, internalization, and internalization-commitment. As she points out, many of us don't follow these stages in a linear order; we often move between stages, revisit stages, or stay at one of the stages for a long time. We understand the stages of digital identity and literacy development in a similar fashion, full of twists and turns, and full of movement in many directions. Students move through various stages when they encounter new literacies and new technologies. Instead of easily transferring skills and applying these skills to new environments, students need to process new information, understand how old information can be translated to further new ways of thinking, and realize that identity development is an ongoing process. Once we were able to connect Tatum's discussions with our experiences as teachers who were trying to make sense of students' digital literacy and identity development, we no longer dismissed our students' behaviors. Instead, we were able to locate their responses as part of a process in acquiring technological literacy. We realized that we simply did not ask the kinds of questions that would allow for a complex reflection and response to the experiences exhibited by our students.

When we negotiated the nuances of the stages that we propose here, we realized that we would see ourselves at different stages of technological identity development, and that we would interpret the stages differently. We also realized that we would skip or repeat stages, and we realized that the contexts of our political, social, and cultural environments determine how teachers and students address or move through the proposed stages. Our experiences have shown us that any hierarchically organized stages have a potential to be taken as just that—hierarchically organized. But we encourage readers to experiment, add and subtract, reorganize,

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and rename to fit their specific contexts and situations. In other words, we encourage readers to see the stages of digital identity and literacy development as a "spiral staircase" where we might revisit the same stages but where we are not necessarily visiting the same exact spot we already explored (Tatum, p. 83). We might also consider ourselves at several stages at the same time, understanding how we are implicated, but also wanting to continue our explorations and excitement about new technologies and new digital media. Certainly, technology users are more complex than our stages can capture, and we cannot assume that users can and will move from Stage 1 to Stage 6. Similar to Tatum's argument that our identity is one that is "unraveling and reweaving" constantly (p. 83), we are convinced that technological identity development can never be complete, especially considering that we encounter technological advancements continuously, and that we are learning about the functional aspects of programs on an ongoing basis. The overall purpose becomes one of making sense of what we experience in the classroom.

Stages of Digital Identity and Literacy Development

Stage 1: Pre-encounter, Encounter, and Enthusiasm

Students, in this initial stage, are new to and enthusiastic about technology and digital media, and although they might be intimidated by it, they are ready to learn more about it. In this initial stage, digital media users want to know how to use the technology to play games, download music, upload clips, chat with friends, or create a space on MySpace or FaceBook. Programs such as *Illustrator, Final Cut,* or *Photoshop* might be a bit more difficult to learn than *Powerpoint* and *Frontpage*, but they are programs that make it easy to create documents. Technology is fun to use, and technology keeps us in touch with our friends. Much of this stage

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is characterized by an emphasis on the functional and technical (Selber, Williams, Selfe), learning new programs, becoming familiar with specific features, and using these features mostly for personal and entertainment reasons. Many students at this stage accept technology and digital media as an inevitable part of their lives, keeping them in touch with their friends and family, and creating fun projects. Imagining new software programs is not so different from imagining a new cell phone with new and ever more complex features. This largely uncritical view is reinforced by overwhelming advertising campaigns that make the use of cell phones with multiple features, specific computer programs, and internet applications a needed component of young people's lives. As Diana Oblinger (2003) points out, many of the "millennial students" (those born after 1982) consider technology "a natural part of the environment" (p. 38). The Pew Internet and American Life Project (2003) showed that 94 percent of students age twelve to seventeen use the internet for research, 70 percent use instant messaging, and 81 percent use email to keep in touch with friends (Oblinger, p. 39). These statistics can be seen as an indicator that many students in our college classrooms are enthusiastic technology users. Furthermore, because technology is "an assumed part of life" (p. 40), many students have not considered any political, social, or economic factors brought about by technology use and abuse.

Stage 2: Immersion, Acceptance, and Internalization

As a result of Stage 1, where technology is considered a natural and inevitable part of students' personal lives, students often immerse themselves in technology and accept its importance in their academic and professional lives. It becomes an all-powerful tool that they need to conquer. They tell their friends that technology is an integral and necessary part of themselves, and that without technology, they wouldn't be able to finish their college career or take a job. However, in many cases, students don't question technology's impact on their education or the job duties

they will perform. They are interested in finding out how to improve their skills to move from individual enjoyment to professional development. But because computers are still seen as an inevitable force in their lives, it is difficult for students to see technology as anything but a mere instrument, a tool that should be used to further ones career and ones status in life. Often, students identify themselves as technology-enthusiasts who ally themselves with others who consider technology and digital media as necessary parts of society. A positive identity, in other words, is dependent on others who share similar viewpoints and ideas about the importance of technology as a functional tool. Criticism about technology is not welcomed nor is it accepted. Instead, group identity is essential in continuing an enthusiastic acceptance of technology. In many ways, this stage can be compared to Brian Street's concept of autonomous literacy which refers to literacy as a cognitive skill, devoid of ideological and societal influences. PowerPoint, for example, is good because they can get a better grade on their assignment and because they can impress less technologically inclined professors and peers.

Stage 3: Realization of Dependence

We consider this one of the most difficult stages in technological and digital identity development. Students realize that they have become dependent on technology, but that they have not really considered the effects of such dependence. At this stage, students understand that technology has become an integral part in their lives, and they also understand that such dependence has led to an uncritical perception of technology and consumption of digital media. Many times, they continue to use technology in similar ways they used it in stages 1 and 2 because they cannot conceptualize life without technology since it is still a "natural part" of their lives. However, students no longer accept complete immersion, nor do they isolate themselves from those who question the impact of technology on local and global communities. We consider

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this stage a reflective stage that allows students to start questioning their past approach to technology. They begin to question whether they really need the latest iPhone, iPod, PDA, or laptop, and whether the 2.3 GHZ is really faster—and necessary—than the 2.0. model.

Stage 4: Disintegration and Disillusion

Students, in this stage, become aware of technology's impact on their own and others' lives. Instead of being "normal" and a "natural part of the environment," technology and digital media are seen as part of a larger conspiracy by the government, businesses, schools, or workplaces intended to undermine individuality and promoting consumerism and dependence on the big brother. Students are aware of their own status as consumers of technology, and as contributors to an ever-growing technology industry. Outsourcing, global poverty, and global warming are no longer abstract concepts. Since students have seen technology and technological literacy as autonomous and purely functional for much of their lives, they do not see any way of countering technology's progress. Technological identity and literacy development at this stage is characterized by an understanding that power structures are implicitly and explicitly intertwined with technologies and technology uses. Based on this awareness, students realize that not everybody has the same access, that not everybody has the same opportunities, and that uncontrolled technology enthusiasm and misuse can be used to exploit workers, establish class barriers, and create a divided nation. Students succumb to criticism, pessimism, and disapproval of established practices and power structures. It is an attempt to move from being an unconcerned user and consumer of technology to a more critically aware participant in technological innovations. However, before arriving at critical awareness, and before understanding their own involvement and participation in a consumer-oriented society, students criticize and blame others while manifesting their opposition to those in positions of power and

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those who make decisions about how technologies will be used. Students might argue that "we shouldn't use computers in an English class" without questioning why computer use in the humanities could contribute to a better understanding of technology's impact on a country's political or economic well-being. They also often argue that there is nothing that individual consumers can do about the proliferation of consumerism, about advertising strategies, or about the part-time and no-benefits hiring practices of big box stores. Their supposed powerlessness, and their belief that they have no options as consumers leads them to distrust communication and scientific technologies without critically analyzing how they can change their own roles in a technology-rich environment.

Stage 5: Detachment and Critical Awareness

Once students understand that technology use has implications beyond the functional and technical, and once they had an opportunity to look at how power structures influence technology use, students distance themselves from seeing technology as integral to their lives. At this stage, they are able to choose when they will use technology, and they are aware of the limitations and benefits of using and not using technology. Instead of blindly accepting or rejecting the effects of digital media and technological advancements, and instead of seeing themselves as outside the existing structure, students are aware of their own role in current practices and events. Stuart Selber and Cynthia Selfe consider this stage as essential components of students' critical technological literacy development where students become analytical and critical viewers, readers, and contributors to the debate on the impact of technology on its users. Students, for example, can express why they make choices such as using their iPod as their external drive, and why they are not interested in video editing and why they don't need that much storage or RAM. Furthermore, they can look critically at the underlying purposes of

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websites, the reasons for including images in their documents, and for using PowerPoint versus other presentation tools.

Stage 6: Self-Reliance and Ideological Consciousness

Students are committed to be critical and ethical technology users and producers. They know that technology influences their identity. They know that they control technology and that they are controlled by technology. They are no longer "possessed" by the machine, nor do they "possess" the machine. Students no longer simply decipher messages; instead, they consider technology and digital media in the context of their own lives and the context of politics, race, gender, religion, history, and war. They are also aware that technology does not lead to health, nor does it lead to war. However, if technology is abused, those abuses can lead to cuts in funding for medical research, and they can lead to increased funding for war efforts. Students at this stage can decide against participating in such abuses, and they can choose to contribute their technological literacy competency to efforts that promote sustainable business practices, increase environmental consciousness, and decrease poverty and discrimination. They are committed to act and advocate for humanitarian uses of technologies and digital media, and they are willing to learn from local, state, national, and global discussions on technology and digital media. Walter Cronkite, in his foreword to *Architects of Peace: Visions of Hope in Words and Images,* offers a perspective on technological advancements that can help students think about the possibilities of using technology critically and consciously. Cronkite calls on all of us to use scientific and technological tools for the "good of humankind everywhere" (p. 10). He urges us—"the educated, the informed, the wealthy possessors of the [technological and communication] tools—to forgo self-aggrandizement and assume leadership…and channel it in a direction that will ensure freedom's future" (p. 10). When one of our graduate students decided to create a

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documentary on volunteer opportunities for first-year students enrolled in an introductory writing class, he used his technological skills to address humanitarian efforts and to raise awareness about the need for volunteer work in a large group of undergraduate students. He was able, because of his self-reliance and ideological consciousness, to use his skills not for his own advancement but to address the needs of others. Certainly, this final stage is one that students might only achieve after many years of experiences and explorations. It is a stage that should continually evolve with the evolving needs of a changing society. But, similar to Cronkite, we are optimistic that "the almost unbelievable advancement in communication…has enabled the people of the world to share their experiences and their hopes, their expectations, and, beyond, the possible solutions to our problems" (p. 10).

Why Stages?

We propose these stages as part of gaining new awareness of student needs and as part of asking new research and teaching questions. We know that concerns of accessibility have consumed much of our time. However, we also know that access is only one of many areas that we need to address among ourselves and with our students. We were especially concerned with finding new ways of addressing student attitudes about computers (they are around, we need to learn how to use them, we need a job), and with understanding why it is so difficult to leave behind what we consider an unwarranted dependence and uncritical acceptance of technology and digital media. Paying attention to early stages of technological identity and literacy development, and realizing that many students have lived in a technology-rich environment where technology has become a "natural" part of their environment, provides us with a fuller understanding of students' attitudes about their uses of technology. In many cases, we do not

have to introduce students to the functional and technical aspects of technology use. Instead, we have to understand why they arrived at their current attitudes, and how these attitudes help or hinder their development as responsible and ethical users of technology. Now that many students come into our classrooms with functional skills, teachers' roles have shifted from introducing students to basic technology skills, and from promoting technology as a positive component of an education, to providing students with skills and tools that let them evaluate the role they are playing in a technology-rich environment.

Beverly Tatum's explicit approach to racial identity development provided teachers with an opportunity to look at the complexities of identity development without dismissing students' attitudes as tribal, racist, or ignorant. It also provided students with a self-reflective approach to their own identities, and it gave language to self- and other-perceptions. Similarly, the stages of digital identity and literacy development we outlined here—and which need to be applied to specific settings and adapted accordingly—show teachers the complexities of technological literacy development, providing an opportunity to approach students' attitudes not as resistance to the critical and rhetorical, but instead as a progression or regression in a long, slow, circular, or spiral way that has to be revised based on new and old perspectives on technology uses. Students who become self-reflective about their own approaches to technological literacy and identity development can also be more pro-active in understanding their own approaches to technology and technological literacy.

From our own experiences in the field, we felt (and still feel) most comfortable when we could use digital media for individual purposes. We remember when computers were introduced into the classroom and into our offices, and when we waited impatiently for a response to our

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email that we sent 2 minutes ago. We also remember being impressed by Flash documents, web editors, and iMovies. We went to conferences admiring students' tech-savvy productions, and we went home to figure out how to incorporate digital media into our classrooms. But many times we didn't pay attention to the messages that were sent, the document content, or the implications that the wider distribution of those documents might have. We are now at a stage, however, where we can no longer expect our students to be impressed by technological *flash*. We need to have extensive conversations with the techno-enthusiast (often ourselves) about the purposes of producing specific documents. We can focus on the rhetorical principles of production, and we can underscore that a rhetorical approach necessitates awareness of larger political, social, historical, and economic factors influencing educational and workplace opportunities, gender issues, race relations, international relations, and military funding.

Rhetoric's dependence on carefully evaluating the purpose of a text, its audience and author, and the context in which a text was created does not allow us to remain innocently immersed in technological advances. Instead, we are asked to move from a functionalist perspective to a perspective that incorporates the complexities of technological identity and literacy development. Our initial enthusiasm and immersion into technology-rich environments needs to move to a realization that technology might not be as innocent, neutral, or one-dimensional as we had assumed. Haraway's cyborg already prepared us that we need to look at the complexities of technology, and even the Terminator movies, initially the story of good technology vs. bad technology, introduced a plot that showed cyborgs as complex and conflicted technological creations.

This awareness of the complexities of technologies needs to lead to a critical awareness of how technology can be used and abused, and it needs to be followed up by an understanding of

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our role as technology users, and our responsibilities to become rhetorically aware users of technology who understand that we cannot be passive consumers of digital media without consenting to the messages provided to us by businesses, political entities, or the entertainment industry. How we see technology users must include a reevaluation of how we see ourselves as technology users. Furthermore, we need to redefine how we see "successful" technological transfer in the classroom. We need to explore and understand our students' digital identities and literacies by allowing them to move through various stages, repeat stages, skip stages, or remain at a specific stage of their development until new concepts and ideas lead to further shifts and movement.

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Literacy through Gaming: The Influence of Videogames on the Writings of High School Freshman Males

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Abstract

This article presents an analysis of narratives written in class by urban adolescent males at an urban high school, to demonstrate the influence of videogames on the thinking processes of these students. An in-depth Internet inquiry linked the students' narratives to different videogames, thus attesting to the role of digital gaming in the shaping of adolescents' written discourse. The findings of the inquiry foreshadow the urgency to rethink literacy and literature, and the way they are taught in today's classrooms. The discussion explores how "pre-digital" educators can best teach literacy to "digital natives," given the impact of videogame content on adolescents' cognitive processes. Pedagogical recommendations stress the potential role of video game literacy in effectively engaging today's generation of learners in literacy endeavors.

Key words: classical literature, digital natives, digital intelligence, game-based pedagogy, literacy, new literacies, pre-digital educators, young adult literature, video games, urban adolescents.

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Introduction

While videogames often evoke concerns among parents, politicians, and educators, they pervade the lives of the youth in today's world and constitute a major component of the "new literacy studies" field (Gee, 2001; Street, 2003). In an era when young generations are digital-friendly (Prensky, 2001) and video game savvy, the role of video gaming in children and adolescents' cognitive development must not be overlooked. Educating today's generation of learners requires an understanding of the new digital environment into which they were born. To effectively communicate with these learners, "pre-digital" educators, whom Prensky (2001) refers to as "digital immigrants," may need become familiar with digital literacy. As they do so, they might come to notice the saliency of video/computer gaming stimuli in the development of students' literacy abilities (Sanford & Madil, 2007). This article presents a teacher-researcher's analysis of narratives produced by adolescent males at an urban high school in order to assess the impact of video game content on written discourse. As the paper unfolds, the following questions are explored:

- How can pre-digital educators negotiate literacy with digital natives?
- What does adolescent writing reveal about the influence of videogame content on adolescents' cognitive processes?
- What does adolescent writing suggest about teaching with and learning from video game story lines?

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Need for a Paradigm Shift: Old versus new literacies

In today's world where technological, as well as other more fun, non-print forms of literacy permeate the lives of the youth, one of the major issues that confront educational leaders has been how to reconcile the old literacies (Meyer & Rose, 1999) with the emergent new literacies (Gee, 2001; Street, 2003).

New literacies: A definition. Although the most widespread definition of literacy associates the term with the ability to read and write (Goody, 1999), this notion has been seriously challenged throughout time. Studies of literacy and its practices, across time and cultures, have led to the observation that literacy is a "many-meaninged thing" (Scribner, 1984, p. 9; Street, 1993). More and more literacy scholars in the new era of technology and global understanding have introduced the "old" versus "new" literacies dichotomy (Gee, 2001; Meyer & Rose, 1999; Street, 2003). According to Meyer and Rose's (1999) interpretation, the old concept of literacy has been based on the assumption that "print is the primary carrier of information in our culture and that the most important skills are those that enable students to understand and express themselves in text" (Myer & Rose, 1999, n.p.). The new definition of literacy, on the other hand, is based on the assumption that "digital technology is rapidly becoming a primary carrier of information and that the broader means of expression this technology makes possible are now critical for education" (Meyer & Rose, 1999, n.p.). The new literacy format requires the rethinking of the role and perception of print literacy, which for a long time has enjoyed prestige and exclusivity (Matusov & Julien, 2004). Accordingly, the significance of the old practices of literacy is being challenged by the pervasiveness of new forms, both digital and non-digital, which have emerged in the post-typographic era (Semali,

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2001).

With the rapid expansion of new technologies and literacies in the world, a broader understanding of literacy is necessary to account for the incoming new forms of literacy. The umbrella term of "new literacies" provides room for "the plethora of communication media available today" (Kist, 2005, p. 12). Examples of new literacies include, but are not limited to: computer literacy, cultural literacy, diagrammatic literacy, document literacy, economic literacy, environmental literacy, film literacy, information literacy, mathematical literacy, media literacy, music literacy, political literacy, scientific literacy, technical literacy, television literacy, video literacy, and visual literacy (Semali, 2001). This paper explores the possibility that video games may constitute a new addition to new literacies and an alternative conduit to school literacies.

Digital literacy, digital generation. Today's generations of children are born in an environment that nurtures the development of digital intelligence (Adams, 2004; Solez, 2008). Through innate ability, practice, and hard work, digitally-intelligent individuals display a facility in processing digital information (Solez, 2008). Some of the salient characteristics of digital intelligence include "logical statements, a strong multitasking ability, and an ability to identify and take advantage of potential connections, to separate information into transformable chunks and reassemble them to new purposes" (Solez, 2008, n.p.). These features seem to characterize most of today's youths, especially those who are born and raised in technologically-advanced parts of the world, interacting with the gamut of digital devices, such as computers, video games, digital music players, video cams, i-pods, and/or cell phones. It is no surprise that "digital literacies'' scholars refer to today's youths as "digital natives" (Hertzog et al., 2005; Prensky, 2001) or the "net generation" (Oblinger & Oblinger, 2005).

Lanham (1995) defines digital literacy, i.e., new literacy in the digital age, as a blend of

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words with recorded sounds and images into a rich and volatile mixture. In contrast, he explains, "print literacy reflects fixity of the captured words, frozen on the page, thus, conferring authority and sometimes even timeless immortality" (1995, n. p.). Having evolved in a print-dominated world, pre-digital generations learned to value print and promote it as the major carrier of information (Meyer & Rose, 1999). On the other hand, today's adolescents, being surrounded with new technology, have internalized digital technology as the primary carrier of information (Meyer & Rose, 1991; Prensky, 2002). As the "new literacy" advocates (Gee, 2001; Pahl, 2006; Prensky, 2002; Street, 2003) would explain, the millennials, as this new generation is called, have been born in a world where print literacy no longer determines the course of cultural, political, and economic development. They, therefore, require a new framework for literacy instruction, which acknowledges both the fluid and dynamic nature of literacy, whose meanings are subject to change according to the cultural context and societal needs (Bandura, 2002). Successful communication between print natives and digital natives requires compromises on both sides and, unfortunately, profound concessions from the pre-digital generation. For as Noam Chomsky's (1972) nativist theory of language acquisition would predict, and the digital intelligence hypothesis has posited, digital natives were born pre-equipped to learn and communicate digitally, and schools need to respect nature's law.

Through a literacy workshop, a small group of adolescent males provided evidence that video games are not just a means for diversion; rather, they play an important role in the youths' construction of print literacy content.

Video game Stories: A New Literary Source for Today's Children and Young Adults

While the label "Nintendo Generation" is known to designate the 1970-1980 generation, statistical reports indicate that video games have continued to be a significant part of the post-

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Nintendo generation (Covi, 2000), also known as Generation M (Media-saturated generation) (Kaiser Foundation, 2005). In response to the 2003 Gallup poll, 69% of teenagers reported that they spent time playing video games each week, and 25% of those polled reported playing at least 11 or more hours per week (Gallup Poll, 2003).

Despite the fact that more entertainment gadgets, including MP3, i-pods, DVR's, have been added to the gaming devices, the 2004 Kaiser Family Foundation (KFF) study of media use among 8-18 year olds shows that the popularity of video games keeps rising. In KFF study, eighty-five percent (85%) of high school participants indicate that the videogame is the sole media device available in the home, whereas 49% reported that they owned their personal videogame console (2005, p. 13). The study further indicates a double increase, from 30% to 63%, among boys who owned a personal videogame between 1999 and 2004 (2005, p. 15). Video games also rank at the top among the activities that pre-teens and teenagers, especially boys, engage in daily for at least an average of 52 minutes (2005, p. 30). The study highlights the fact that pre-teens and teens spend a significant amount of their spare time interacting with screen media, whereas their engagement in reading print media shows a declining pattern. Of the 73% who report reading print daily for at least 5 minutes (and 30 minutes, at most) per each medium, 34% read news papers, 47% magazines, and 46% books.

Video game literarists (Gee, 2006; Robertson, 2004) have extended the notion of reading beyond print, and art beyond traditional film and literature. One type of video games which involves intense reading activity is serious games, such as history-based and classical literature-based games. Serious games require that the gamer have "the ability to not only see what [the] character is doing on the screen, figure out where [s/he] needs to go and how [s/he] could get there, but to actually read the text within different screen shots in order to learn how to play"

(Robertson, n.d., n.p.). As a video game connoisseur, Gee defines video gaming as a "proactive production of story elements, a visual-motoric-auditory-decision-making symphony, and a unique real-virtual story which produces a new form of performance art co-produced by players and designers" (2006, p. 61). Gee's notion of videogame as art has enlisted the support of game enthusiasts, who have gone to the extent of treating video games as literature (Kevin G[1]., 2008). For Kevin G., "games, like novels and films, rely on varying degrees of plot and narrative to make a point" (2008, n.p.). A close examination of videogames, films and novels seems to yield striking similarities between the three mediums both in form and content. Like mainstream literature and film, videogames represent different genres and subgenres. Just as an avid reader or a movie fan has several film genres to choose from, so does the videogamer.

A Wikipedia synthesis of classification systems proposed by different video game analysts (Apperly, 2006; Bateman, 2004; Crawford, 1982; Lindley, 2003; Wolf, 2001) identified a three-way videogame genre classification model: the interactivity/action, the game plot or content, and the longevity video games. Three major families – major genres, notable genres, and superseded genres – are described below.

Major genres include: action, fighting, role playing, platform game, simulation games, sports, and strategies. Action games are further subdivided into action-adventure and first-person shooter games. Fighting games include: "versus fighting" and "beat 'em up." This major role-playing subgenre consists of massive multiplayer online games. Simulation games include simulators, god games, economic simulation games, and city-building games. Simulators are comprised of flight, military, space, and train games. The main subgenre listed under the sport genre is racing; however, the sport genre category encompasses all the major sports, such as

[1] The author did not provide his full name, and the APA manual does not provide guidelines for citing such a source.

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cricket, baseball, soccer, American football, boxing, golf, basketball, skateboarding, ice hockey, tennis, bowling, and rugby. Under the strategy genre are strategy war games, real-time strategy and turn-based strategy games, and real-time tactical and turn-based tactical games. *Notable genres* include: adult, adventure, arcade, artillery, educational, maze, music, party, pinball, puzzle, stealth, survival, horror, and traditional and vehicular combat. *Superseded genres* include: interactive movies, light-gun games, and scrolling shooters.

An overlapping feature in newer videogames is their hybrid design. It is not unusual to find new games that combine features from more than one subgenre across genres. This hybrid feature, a model that should be adopted in diverse classrooms, may be necessary to maintain the challenge for more experienced gamers. To an educator interested in the educational value of digital gaming, a genre-based taxonomy of videogames can be instrumental in the recognition of games that have the most cognitive impact on gamers. By providing students with opportunities to convert videogame knowledge into school literacy, the following analysis came about, revealing the fact that videogame genres were compatible with school writing tasks.

Videogame Features in the Narratives of Urban Adolescent Males: The Inquiry

As a digital neoliterate who is still exploring the world of video/computer games, it took a first-hand experience for me to capture the magnitude of the impact of videogames in the lives of today's adolescents. An epiphany of sorts took place in a reading/writing workshop I implemented with reluctant adolescents at an urban high school.

Background. One particular afternoon, the 18 freshman students (12 males and 6 girls), who had been assigned to my reading/writing enhancement workshop, refused to read from award winning young adult fiction writer, Robert Cormier. Since Cormier's fiction was "mad boring" to my audience, I was left with no option but to ask them to write their own stories. To

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my surprise, my rather punitive instructions; requiring them to "write stories that would not be boring to read, stories that would have a clear story line, with an identifiable plot, a dynamic conflict with the exposition, the rising action, the falling action, and the resolution;" met no opposition.

I was impressed with the diligence with which all the students wrote non-stop from imagination until the bell rang. The experience left me curious to read their writings. A quick perusal of the drafts revealed surprising facts. The girls' writings showed a common tendency to write about their personal experiences, while the boys' stories showed very little connection to their daily encounters. Instead, the names of the characters and, in some cases, the titles of their stories hinted to some association with either video game stories or action movies. This new discovery placed me in a serious dilemma, as a literacy educator. Was I going to join the videogame literacy club (Norton-Meier, 2005), or was I going to dismiss the students' videogame-inspired work as trivial writing? My first responsibility as a literacy instructor was to respond to the student writings. Whether I liked their topics or not, in order to adequately guide the young men's writing processes, I was obliged to educate myself about the sources and the nature of their "alien" stories.

Procedure: The first information source that came to mind was the Internet. Internet inquiry revealed that nine of the twelve male students, who fully engaged in the narrative writing task, drew most of their ideas from popular videogames. This was confirmed through an in-depth web search for information related to iconic expressions featured in the students' narratives and the literature on the video games from which they originated. A keyword search for names and places featured in the stories was about to launch me on a new path of literacy inquiry, to explore the effect of video gaming on the literacy practices of today's youths. After

obtaining the approval from the Internal Review Board at my institution, I carried out an anonymous analysis of the students' writings.

Discovery. The nine stories that were identified as adaptations from videogames included: "The Boy with the Magic Finger," "The Legend of Link," "The Noblest Mission," "The Legend of Caliny the Invincible," "The Twist of the Mysterious Glass Bowl (sic)[2]," "Final Fantasy II, Tales of Destiny," "The Chains of Horror," and "First Flight Last Sight." Table 1 identifies the students' stories and the original games from which they were derived.

Table 1.

A summarizing chart of "student story" / "source videogame" correspondence

Student Story Title	Word Clue from Student Story	Source Video game
1. Boy with Magic Touch	Magic Powers	*Legend of Zelda*
2. Legend of Link	Legend of Link	*Legend of Link*
3. Legend of Caliny	Caliny and Karina	*The Story of Ocarina*
4. Twist of Mysterious Glass	Trapped in a ball	*Link's Awakening DX*
5. Last Flight Last Sight	Crash on an island	*Link's Awakening DX*
6. The Noble Mission	Necromancer	*Knight's Quest*
7. Final Fantasy II	Final Fantasy	*Final Fantasy II*
8. Tales of Destiny	Tales of destiny	*Tales of Destiny*
9. Chains of Horror	Evil Horror	*Resident Evil*

Based on the Wikipedia genre classification format previously described, eight of the stories combined action-adventure and role playing characteristics, and one was exclusively modeled after a horror game. Five out of the nine stories ("The boy with the Magic Finger,"

[2] The common expression in videogame literature is "ball", as in "crystal ball".

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"The Legend of Link," "The Legend of Caliny the Invincible," "The Twist of the Mysterious Glass Bowl", and "Last Flight, Last Sight") had features traceable to *The Legend of Zelda Series*. "The Boy with Magic Touch" featured a story of a boy whose sister, like Princess Zelda, had magic powers that enabled him to restore dead lives. "The Legend of Link," a direct adaptation from *The Legend of Zelda*, focused on the exploits of Link in his mission to rescue the princess from deadly monsters.

The "Legend of Caliny, The Invincible," featured the story of an invincible female warrior with supernatural abilities that enabled her to shoot magical orbs, teleport, move things, and transform into an animal. The character name search for Caliny and Karina linked Caliny's legend to *The Story of Ocarina of Time*, third in *The Legend of Zelda* series. "First Flight, Last Sight," seemed to be an adaptation from *The Legend of Zelda: Link's Awakening DX*. Both stories feature protagonists who incur problems while on a trip and both end up trapped on an island. In *Link's awakening DX*, Link is shipwrecked in a storm and remains trapped in scary nightmares while on an unknown island. In "First Flight, Last Sight" Maria's flight to Egypt turned out to be the last sight by her children, when her plane crashed and she found herself on a desert island away from home.

The tale of "The Twist of The Mysterious Golden Glass Bowl reflected the magic power and the chivalrous attributes invoked in *Link's Awakening DX*, as well. In a dream, Johnson imagined the J-team of five boys using several magical scrolls to defeat his captors, Bubweiser, the evil god, and Dr. Scarface, his evil crime lord. The J-team successfully freed Johnson, captured Dr. Scarface and left Bubweiser trapped in a golden glass bowl for several years. Like Link, Bubweiser had to defeat nightmares to get out of the golden glass bowl trap back into the waking world.

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In the "Noble Mission," a warlock used magic powers to teleport himself to a remote place and overcome all the obstacles while on a mission to find out about the secret of his parents. A keyword search for main terms like Necromancer and warlock connected the story with *Knight's Quest*. Both "The Noble Mission" story and *Knight Quest* revolve around the exploits and magic powers of knights and warlocks. The story titled "Final Fantasy II" was self revealing; it was a recreation of the plot in *Final Fantasy*, from the perspective of the student author. Like in "Final Fantasy II," the author of "Tales of Destiny," narrated the adventures described in the actual videogame, *Tales of Destiny*. The recreated tale was a layman's version of a country-boy-turned-adventurer, Stahn Aileron, who sought fame and adventure by sneaking aboard the flying ship Draconis as a stowaway, eventually managing to free himself through the use of a magic sword.

Finally, "The Chains of Horror," a horror story of an evil priest who was caught raping and mutilating his female victims, was traced to the *Resident Evil* videogame revolving around a series of cannibalistic homicides that occurred in the Arklay Mountains region. In the original game, the local police's Special Tactics and Rescue Service (S.T.A.R.S.), who were commissioned to investigate the sources of these murders, found mutilated bodies. This original story version is somewhat less horrifying than the student's story, which featured body parts of women victims that were found in the evil priest's cave.

The results of the internet inquiry as well as the matching made between the video games and the students' writings seem to support the conclusion that the student authors were influenced by video games characters and plots. Another observation that was derived from the analysis was the literary equivalence between videogames and traditional literature, as discussed below. What this suggests for teachers as well as curriculum development experts is that

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classroom instruction, especially in literacy and literature, needs to be bridged by this popular medium.

Discussion: Gaming Insights for Literature and Literacy Educators

The more one analyzes the content and composition of action-adventure and horror videogames, such as *Resident Evil, Legend of Zelda, Tales of destiny,* the more one realizes that the plot and characterization in action-adventure and horror games share the same literary features with some popular classical epics like *Beowulf* or *the Odyssey,* and other ancient canonical works like Chaucer's *Canterbury Tales* or other Greek mythologies, or even more philosophical works like Plato's *Allegory of the Caves*. The nine novice authors of the narratives considered in this article have confirmed Bart Simon's (As cited in Comeau, 2004) and James Gee's (2004) argument that videogames are a form of literature.

Literature educators who are also video-game savvy have engaged in drawing parallels between classical literature and video games stories (Brinckerhoff, 2007; Hidey, 2006). Professor Roger Travis from the University of Connecticut is said to have found many analogies between the game *Halo* and Virgil's *Aeneid*. According to Travis's interpretation, "Both *Halo* and the *Aeneid* tell a story about a more-than-human hero defeating enemies who would be too much for ordinary people like us – enemies who nevertheless bear an important resemblance to the ones we and the Romans face in our respective presents" (As quoted in Brinckerhoff, 2007, n.d., n.p.). Travis's emerging approach was further reinforced by the recent trend in the videogame making industry to emulate classical literature characters. In March 2008, FunBox pundits speculated that the next big trend would be more videogames based on classical literature, such as *E. Bronte's Wuthering Heights: Heathcliff's Revenge; Huckleberry Finn's Xtreme Rafting;* and A. Miller's *To Kill a Mockingbird: Furor Excessum.* In Japan, *Kurayami*

inspired by Kafka's *The Castle*, is viewed as the precursor of the dawn of literary videogames (Kotaku, 2008). In defense of the literariness of videogames, Derek Hidey (2006), editor of the *Bittersweet Art and Literary Magazine*; argues, "You can apply all those classic themes we have come to love in the English department: gender roles, class struggle, treatment of children, guest-host relationships, etc., to any video game story" (2006, n.p.).

Finally, the narratives of the digital natives analyzed in this study provide strong hints as to which video game genre is more teachable. It seems that the students had more facility to write about role-playing games. That this type of games was appealing to most writers could be due to the dynamic interactivity they allowed, thus making the plot reconstruction process less challenging. During the writing process, the young authors tended to place remarkable emphasis on the plot development, the highlighting of heroic virtues and the determination of main characters' outcome.

Conclusion/Pedagogical Recommendation

The content of the writings of the nine adolescents discussed in this article provides evidence of videogame influence in the cognitive processes of digital generation learners. Literacy instruction needs to provide students with the latitude to draw from their prior knowledge to develop school literacy. Teacher education programs need to prepare future teachers of Nintendo and Post Nintendo generation learners to adequately address pedagogical situations that involve digital intelligence.

Playing the doubting game by net searching the names and titles featured in the students' stories "teleported" me to the world of teachable treasures concealed within videogames. By tackling the writing task without asking for prompts, the students demonstrated that they could write independently and that, if given an opportunity, they are capable of thinking for

themselves. The complexity of the students' story lines demonstrated their ability to apply video game skills to perform a cognitively challenging task. It certainly took wit and craft to recollect the countless moves that must be performed in a videogame sequence and condense them into a coherent story.

There seems to be an unquestionable consensus among scholar-gamers on the literary equivalence between classic literature heroes, such as Odysseus and Aneus, and contemporary videogame characters, such as Link or Stahn Aileron. Moreover, the expanding list of classical literature-inspired games[3] is an indication that the public, young and old, show interest in them. Gamers, as seen in this analysis, can achieve a deep knowledge of the videogame plots to the point of inferring their own fan fiction narratives from game story lines. It can be inferred that this knowledge can help in the understanding of equivalent literary works. Perhaps, supporting the teaching of classical works with videogame scaffolds could be a more rewarding experience adolescents than using the not-so popular, Cormier-type fiction. We need to take advantage of this unique form which "has the potential to integrate pleasure, learning, reflection" (Gee, 2006, p. 61) to incorporate the fun that male adolescents may reluctantly leave behind when they have to go to school. Otherwise, issues of student disengagement may remain.

Suggestions for Research Considerations

While the workshop that led to this article was not intended to be the subject of research, the prevalence of videogame features in the narratives of participating male students highlighted the need for further exploration of ways in which videogame-based pedagogy could increase learning engagement among adolescent males. Suggested areas of research could include:

[3] A comprehensive list of literature-inspired games since 1982 can be accessed at: http://www.mobygames.com/game-group/literature-inspired-games.

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- The impact of a videogame-based pedagogy on male student retention;
- The effect of multiplayer gaming on co-construction of knowledge;
- Relevance of videogame knowledge across the disciplines; and
- Videogame practice and gamers' attitude toward learning instructions.

Each of these areas of study is likely to provide educators with insights they need to prepare students who are adept at dealing with the ubiquity of information technology in today's world.

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Use of the Wiki: Encouraging Preservice Teachers' Construction of Knowledge in Reading Methods Courses

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Abstract

In consideration of how teaching and learning might be structured to address learning style preferences of preservice teachers and to make effective and efficient use of instructional and learning time in a constructivist setting, a wiki was used in a teacher education reading methods course. Increasing understanding of reading instructional approaches and modeling use of technology in reading instruction were central to the project. Results point to benefits of using wikis as tools to support students' construction of knowledge, but also indicate the importance of scaffolding students' wiki work in constructivist settings. (Keywords: preservice teacher preparation, technology use, wiki, learning styles, constructivist settings).

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Introduction

Wikis are quick user-friendly web pages that allow users to create, edit, and save text collaboratively. The term "wiki" refers not only to the site of participation on the web but also to the document (the artifact) created by participants (Grant, 2006). Wikis has been around since 1995 when they were first introduced by Ward Cunningham (Forte & Bruckman, 2006). Cunningham coined the term wiki, borrowing the Hawaiian word for "quick." There are a number of sites that host wikis and provide tools for creation of wiki sites such as Wikispaces, PBwiki, and Twiki.

Once created, the wiki acts as both a document and a webpage. An edit option allows for text entry on the document while the save option converts the document into a webpage which may be browsed and read by others (Educause, 2007; Lamb & Johnson, 2007). The wiki also serves as a record of contributions, edits, and changes that have been made to the document. The ability to revisit earlier versions of the document provides a bit of security if changes have been made or contributions have been deleted that are later determined to be significant. Similar to web pages, hyperlink options within the wiki allow users to connect pages to explain linked words in the context of related information.

Uses of the Wiki

Wikis are being used by business and education professionals for document management, collaborative writing, and communication purposes. The wiki is, however, still a relatively new application for use in instructional settings.

As instruction and learning tools, wikis are being used as social networking spaces for communication, sharing information in the form of reviews and reports, and note-taking

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(Dearstyne, 2007; Lamb & Johnson, 2007; Luce-Kapler, 2007). Wikis may be used in yet other ways including using them as repositories for document collection. Preservice teachers may create a wiki to upload information and links related to topics for research and unit construction. Others may visit the site to add to the repository or to access posted resources.

Similar to a repository, the wiki may be used as an e-portfolio (Educause, 2007). In the creation of an e-portfolio, text may provide an introduction to work presented. Documents and other artifacts which serve as evidence of acquired knowledge, skills, and dispositions are uploaded to the wiki page. Links within the wiki document lead viewers to pages with additional artifacts sorted by standards or themes. The collaborative nature of wikis allows readers to provide feedback on the contents or organization of the e-portfolio.

Additionally, the wiki may be used as a message board. In this case the wiki serves as a collaboration tool in organizing the work of a group. For example, in place of organizing e-mail messages, group members add messages to one central location—the wiki document. The sequenced messages on the wiki provide a record of the group's thinking.

The online encyclopedia Wikipedia is a model of yet another use of the wiki. While all wikis are collaborative, the Wikipedia model represents a group authoring exercise for the creation of an integrated document. In this model a preservice teacher begins composition of a draft. As other preservice teachers read the text, they may choose to add further information anywhere within the document. They may also eliminate or replace text. In the Wikipedia model the document becomes ever more refined as readers/writers work collaboratively to shape it.

In addition to selecting the type of wiki to be used for instruction and learning in preservice teacher reading methods courses, other factors may play a role in effective use of the

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wiki in this context. These include students' learning preferences and the knowledge and skills needed for effective literacy instruction and learning.

Review of the Related Literature

Learning style preferences

The learning style preferences represented in any group of students are multiple and varied. David A. Kolb's (2005) cognitive learning style model identifies four learning style preferences including Concrete Experience (CE), Reflective Observation (RO), Abstract Conceptualization (AC), and Active Experimentation (AE). Concrete experience learners prefer to learn through hands-on type of activities. These learners also prefer authentic or real-life experiences such as being involved in interviews, engaging in practicum experiences, and viewing tasks in which professionals in the field would likely be engaged.

Reflective Observation involves thinking about one's own thinking or metacognition. Reflective Observation also involves considering subject matter from multiple perspectives and thinking about the interrelatedness of topics in information presented (Solvie & Kloek, 2007).

Abstract Conceptualization learners prefer to get information from authoritative sources. Listening to experts share information about the field and being involved in research are experiences Abstract Conceptualization learners prefer.

Active Experimentation describes learners who prefer to apply what they have learned. Learners with this preference enjoy tasks in which they are allowed to role-play, practice techniques, or work in the field in short and long term practicum or intern positions (Kolb, 1984).

In addition to identifying Concrete Experience, Reflective Observation, Abstract

Conceptualization, and Active Experimentation as learning style preferences, Kolb's research describes learning *styles* as combinations of preferences (Kolb, 1984, 2005). Kolb explains that learners prefer to grasp information through one particular preference and process it through another. Kolb identifies grasping and processing as continuums. When combined along two continuums of Concrete Experience/Abstract Conceptualization and Reflective Observation/Active Experimentation, four learning styles are identified—Assimilators, Divergers, Accomodators, and Convergers. Learners labeled Divergers like to grasp information through Concrete Experience and process it through Reflective Observation. Assimilators prefer to grasp information through Abstract Conceptualization and process it through Reflective Observation. Unlike Assimilators, however, Convergers wish to grasp information through Abstract Conceptualization and process it through Active Experimentation. The fourth group of learners labeled Accomodators prefers to grasp information through Concrete Experience and process it through Active Experimentation (Kolb, 1984, 2005). Figure 1 demonstrates two continuums and four styles which are made up of four learning preferences.

(Insert Figure 1 here.)

Students' learning styles are made up of different degrees of the four preferences. For example, some students may have a strong preference for one of the four and only a slight preference for the other three. While it is important to assist students in learning through Concrete Experience, Reflective Observation, Abstract Conceptualization, and Active Experimentation, students have preferences for how they wish to learn, or how they enjoy learning. Identifying learning preferences and selecting tools that target these preferences may support students' learning. This support can be described as making learning accessible (Kolb, 1984) or understandable when it is presented in a way that draws students into the learning

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process, and once drawn in, allows them to process information and ideas easily.

Constructivism

As part of the learning process, students *construct* knowledge. Individual and social construction of knowledge is the result of acting on objects or experiences (Philips, 2000; Piaget, 1971; Vygotsky, 1978). As a coach or expert guide, an instructor uses readings, lectures, visuals and videos, field experiences, experiments and other work with materials, social interaction through discussion, and feedback to scaffold construction of knowledge. Scaffolds also take the form of questions, interactions with others, and experiences through which new and more difficult information is presented. Scaffolds serve as a bridge between what learners can do on their own and what they are able to do with assistance (Vygotsky, 1978). They support as well as prompt students' development. Students reflect, rearticulate, and recombine existing content as knowledge is constructed and ideas come to be understood as a result of scaffolding.

Actively constructing meaning in the learning process may also involve working in teams and within social networks as active inquirers. Experiences and interactions create disequilibrium, prompting the learner to consider how information and experiences relate to held beliefs and ideas. Assimilation, integrating ideas into existing concepts; and accommodation, adapting held beliefs as a result of newly acquired ideas, are part of constructivist learning (Gruber & Voneche, 1977; McCarty & Schwandt, 2000; Piaget, 1971). Students "redefine or discover new meanings for the objects with which they interact" (Bredo, 2000, p. 132). Through interaction with ideas, objects and others in authentic learning activities, learners' ideas and contributions also serve as springboards (challenges) for their classmates to reconsider their thinking and responses (Sorenson & Murchu, 2006), which in turn prompts further thought in other learners.

Writing serves an important role in constructing knowledge, supporting thinking, and making meaning. Writing supports reflection on and integration of new knowledge with existing knowledge (Forte & Bruckman, 2006). Understanding that "no act of writing takes place in a social vacuum" (Clark & Ivanic, 1997, p. 232), collaborative writing allows writers to build on the contributions of others and provides impetus for others' reflection, integration, and construction of knowledge (Grant, 2006). However, collaborative writing in and of itself does not ensure that all participants are equally represented in the process or in the completed artifact, though all are given the opportunity (Shuman, 1993).

Reading Methods Instruction

Teaching preservice teachers how to teach reading continues to be a complex task. In reading methods courses there are both cognitive and social expectations associated with learning activities and assignments. Expanding notions of what it means to be literate, examining how people use literacy in their everyday lives (Barton, 1994) and considering effective practices for literacy instruction need to be addressed (Krucer & Silva, 2006). As explained in new literacy studies (Barton, Hamilton, & Ivanic, 2000; Gee, 2000; Goodson, Knoebel, Lankshear, & Mangan, 2002; Kress, 1999; Lave & Wenger, 1991; Leu, Kinzer, Coiro, & Cammack, 2005; Pahl & Rowsell, 2006; Street, 1993, 1995), characteristics of literacy and the context in which it is learned apply both to K-12 students and to the preservice teachers who will be teaching them to read.

New literacies

New literacy studies (Barton, et al., 2000; Gee, 2000; Goodson, et al., 2002; Kress, 1999; Leu, et al., 2005; Luke, 2000; Pahl & Rowsell, 2006; Street, 1993, 1995) have focused attention on the situated nature of literacy, emphasizing that literacy is a social practice and that literacy

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practices are what people *do* with literacy. Literacy is connected to use and is represented in ideologies and identities. Barton, et al. (2000) explain that literacies are a part of and help shape the social institutions and power relations which sustain them, they are shaped by social rules, and they exist in the relations between people, within groups and communities. Social networks are part of this.

Gee (2000) refers to the 'social turn' movement, of which new literacy studies are a part, and notes that "networks are a key metaphor: knowledge and meaning are seen as emerging from social practices or activities in which people, environments, tools, technologies, objects, words, acts, and symbols are all linked ('networked' with) each other and dynamically interact with and on each other" (pp. 183-4). Working in teams may involve project completion and may lead to understanding the whole work process while continually working to transform and improve that process through collaboration with others and with technology (Gee, 2000; Hargreaves, 2003; Lankshear & Synder, 2000; Sorenson & Marchu, 2006). This is important because preservice teachers will work in settings which involve social networks. They will teach students who will learn and work in the knowledge society, which involves social networks. Their work in schools will involve communities of practice, professional learning communities, and school district grade level teams.

Would a Wiki Work?

Preservice teachers are both students and teachers (Solvie & Kloek, 2007). As students continuing to develop content knowledge and pedagogical skills, their preferences for learning may affect how they grasp and process information. Similarly, learning style preferences may affect how they work collaboratively in social spaces in and outside the classroom to construct

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knowledge.

To address the learning style preferences of students, the social nature of literacy, and to further develop preservice teachers' content and pedagogical skills, the wiki was selected as an instruction and learning tool in a reading methods course for elementary school preservice teachers. It was hoped the wiki would create an authentic learning context and connect social literacy practices with construction of knowledge around reading methods.

Though students in the reading methods course have in common college experiences and the goal of becoming elementary school teachers, they nonetheless represent a variety of diverse experiences, or multiple realities. Philips (2000) argues that social constructions of reality "even though unavoidably shared to a large degree *within* groups, are nonetheless relative to the norms and purposes that comprise this or that social/group's 'background of intentionality,' norms and purposes that vary *among* groups and that can only be properly understood with some reference to the insider's perspective" (p. 29). Students' diverse experiences would possibly serve as scaffolds to support construction of knowledge in wiki work as students "engage in processes of reflection, adaptation, articulation, and rearticulation, guided and supported by the teacher" (Sorenson & Murchu, 2006). Perhaps through wiki work students would be brought together in a social network during the process of reading and writing collaboratively. Along with this, the wiki could possibly assist preservice teachers in recognizing how diversity of thought and issues of power affect literacy development.

Research Questions

To examine the effectiveness of the wiki as an instruction and learning tool in reading methods instruction, four questions were identified to guide the study.

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1. Did learning style preference have an effect on use of the wiki?
2. Did use of the wiki increase understanding of the social nature of literacy?
3. Did use of the wiki increase understanding of reading instructional methods for students with various learning style preferences?
4. Did use of the wiki support students' ability to construct knowledge in the context of the reading methods course?

Affordances of the Wiki

Several affordances of the wiki prompted its selection for this study including possible support for learning style preferences. Collaborative, asynchronous tasks that are a part of wiki work align with learning style characteristics of Reflective Observation (RO), including careful observation prior to forming judgments, viewing issues from multiple perspectives, and analyzing for meaning. Characteristics of Abstract Conceptualization (AC) including logically analyzing ideas, planning systematically, accessing authoritative sources of information, and acting on an intellectual understanding of a situation (Kolb, 2005) might be supported through wiki work. The authentic experience of collaborating with others, influencing people and events through action, using technology, and discussing content specific to the field may support the work of students with Concrete Experience (CE) and Active Experimentation (AE) learning style preferences.

Other affordances of the wiki including close reading and engagement in the writing process aligned with literacy work in a constructivist setting. Prewriting (reading and research), drafting, revising, and editing could be used to increase knowledge of reading instructional approaches. Close reading, as a result of rereading the document following contributions and

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edits, might support examination of information, lead to questioning of material within the document, and prompt further contributions, along with further edits. It was hoped that the continual construction and negotiation of text in the process of researching (reading to gain information), writing, and rereading the wiki document would serve as a scaffold for preservice teachers. As a scaffold, the group interaction and collaborative writing within the wiki might help students focus on domain knowledge that is important to this field, but also to the processes of reading and writing. These processes would include identifying problems and gaps in their understanding (Grant, 2006) and deciding as a group how to improve the document by filling in the gaps and solving identified problems through further research and clear writing.

The wiki might also provide additional benefits resulting from opportunities to work within social networks. Use of the wiki in reading methods courses might promote understanding of the social nature of literacy and the multiple realities represented in social groups.

Yet another affordance of the wiki—being able to plan online without meeting face to face—could free up class time needed for planning and allow students to contribute to the wiki document when they chose to do so. Working within their own timeframe might support reflection and analysis prior to response.

Because of these affordances, the wiki was used as a groupware tool to engage students in a social network and to encourage social construction of knowledge about reading methods. To answer the study's four research questions the following method was used.

Method

The study took place during a three week period of a semester long reading methods course for preservice teachers. Eighteen preservice teachers participated in the study.

A combination of quantitative and qualitative methods was used. Data sources included the 2005 Kolb Learning Style Inventory, wiki scores (number of wiki posts and wiki project score), and a five point Likert Scale Questionnaire and reflection document. Data were sorted according to all four learning style preferences (Abstract Conceptualization, Reflective Observation, Active Experimentation, and Concrete Experience) for each student, as identified using the 2005 Kolb Learning Style Inventory.

Participating preservice teachers completed the 2005 Kolb Learning Style Inventory by responding to twelve questions about their learning to identify individual learning style preferences. The Learning Style Inventory scores indicated the degree to which students preferred Concrete Experience, Reflective Observation, Abstract Conceptualization, and Active Experimentation.

A Twiki site was used for the study. The professor organized the wiki with sections within the document for six topics that focused on methods of reading instruction. An introduction was provided on these six approaches in week three of the course. Connections to these approaches were made in the following weeks as reading strategies were introduced. This initial introduction provided a foundation and served as a scaffold for later student investigation of the reading approaches.

One-half hour of instruction and demonstration initiated students to the wiki environment. The professor used verbal and visual modalities to demonstrate how to access the Twiki, how to log into the site, how to navigate to the writing space, and how to make use of editing tools within the space. The professor also provided written steps as to how to perform all actions demonstrated in class, and provided a written help document for students. Students were encouraged to e-mail or visit the professor's office for assistance with the wiki. Five students

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(four e-mails and one office visit) took advantage of this opportunity. Each of these students indicated they were seeking assistance for themselves and for their group members.

Groups of three were formed based on student selected topics (Philips, 2000) from the six the professor identified. Students researched and collaboratively composed their research findings. Each group also completed a concept map, which they uploaded to the wiki. The concept map outlined information specific to their reading instructional method as well as a reading strategy. The reading strategy included in the wiki document further highlighted the uniqueness of the reading instructional approach.

Wiki work involved taking individual responsibility to investigate/research an approach to reading instruction and demonstrating initiative in posting information as a way of speaking knowledgeably about the approach. It also involved persevering through the collaborative process of close reading of posted information and making changes where necessary to present an accurate, detailed account of the approach in an organized manner within the wiki environment. Consistent contributions over the three week period to the creation of a collaborative document for their group were expected. Wiki history provided information for students in all groups to view changes and contributors throughout the three week period. Research skills, collaboration skills, writing skills, and technology skills were thus all important and necessary for effective work in completion of the wiki assignment in this context.

Students' work was evaluated on the basis of individual contributions to the wiki as documented in number of posts. This score provided for individual accountability. The wiki project was evaluated and a wiki project score was given to each student. Wiki project scores were based on individual posts and accuracy of the group document.

The wiki project was completed in weeks nine, ten, and eleven of the semester. In week

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twelve, following three weeks of collaborative writing and reading of group documents, each wiki group discussed the contents of their wiki document in class with members of all the wiki groups. Corrective feedback was provided by the professor. The wiki assignment checklist used for the project may be found in Appendix A.

A five point Likert Scale Questionnaire (1-strongly disagree, 5- strongly agree) and reflection document with open-ended questions were used to gather data on students' experiences in the wiki project following completion of the project. (See Appendix B.) Students' responses (Appendix C) were analyzed according to learning style preference scores. Seventeen of the eighteen participating preservice teachers completed the questionnaire.

Results

Data—learning style preference scores, number of wiki posts, wiki project scores, Likert Scale Questionnaire results, and reflection document responses—were reviewed to answer questions which guided the research study:

1. Did learning style preference have an effect on use of the wiki?
2. Did use of the wiki increase understanding of the social nature of literacy?
3. Did use of the wiki increase understanding of reading instructional methods for students with various learning style preferences? and
4. Did use of the wiki support students' ability to construct knowledge in the context of the reading methods course?

Learning style preferences and wiki scores

The scores of the eighteen students who completed the study indicated preferences for a combination of the four learning style preferences. While it is possible to score between 12 and

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48 for each learning style preference on the Kolb Learning Style Inventory, scores for students in this study indicated these results: Concrete Experience scores ranged from 14-39, Reflective Observation ranged from 20-40, Abstract Conceptualization scores ranged from 16-35, and Active Experimentation scores ranged from 28-42.

The number of wiki posts ranged from one to twenty-one. Sixty-five out of 500 total points for the course were possible for the wiki project. Wiki project scores ranged from forty-five to sixty-five.

Principal Component Analysis

Learning style inventory preferences are based on principle component analysis (PCA). Therefore PCA was chosen for analysis of learning style preference, wiki post, and wiki project score data in this study. PCA reduces the dimension of data by forming linear combinations of the original variables to explain as much variation as possible in the original data (Everitt & Dunn, 2001). Also, PCA produces graphical representations such as biplots that allow users to see patterns and relationships in the data.

PCA using learning style preference scores (Abstract Conceptualization, Active Experimentation, Reflective Observation, and Concrete Experience), number of wiki posts (representing individual contributions to the wiki), and the overall wiki project score (representing individual and group performance) was completed. The first two principal components together explained 84% of the variations in the data. Principle Component 1 contrasted the scores of Abstract Conceptualization and Reflective Observation to Concrete Experience and Active Experimentation. Principle Component 2 contrasted the scores of Reflective Observation to Concrete Experience and Abstract Conceptualization.

Figure 2, a biplot of standardized principle components (Everitt & Dunn, 2001), uses

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these two components. Students are identified within the chart by number. Student location within the diagram indicates preferences for Concrete Experimentation (CE), Active Experimentation (AE), Abstract Conceptualization (AC), and Reflective Observation (RO). Because students have a combination of preferences, the diagram shows numbers in between the preferences, rather than clustered around them. The biplot shows students with high Abstract Conceptualization (AC) scores closest to the wiki posts (indicating they posted more than their peers) and the overall wiki project (indicating they had the higher scores on the wiki project than did their peers) in the analysis.

(Insert Figure 2 here.)

Classification and Regression Trees (CART)

Classification and Regression Trees (CART) were used to further analyze the relationship between students' learning style preference scores and their wiki work. Figure 3 illustrates the relationship between learning style preferences and the number of wiki posts while Figure 4 displays learning style preference and wiki project score data. The CARTs indicates that the number of posts were lower for students with Concrete Experience (CE) scores higher than 24. The students with lower than 24 on Concrete Experience (CE), but higher than 31 on Abstract Conceptualization (AC), have a substantially higher number of posts than others in the group. On the other hand, wiki project scores were lower for students with Active Experiementation (AE) scores higher than 40. Students who received high wiki project scores had higher than 31 Abstract Conceptualization (AC) but lower than 40 Active Experimentation (AE) and lower than 24 Concrete Experimentation (CE) scores.

(Insert Figure 3 here.)

(Insert Figure 4 here.)

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Likert scale scores and wiki reflections:

A One-way Analysis of Variance (ANOVA) testing for differences among learning style preference groups was used to analyze Likert Scale Questionnaire data.

Students' learning style preference scores and responses to the nineteen items on the Likert Scale Questionnaire were used in the analysis. Means were determined for each learning style preference for each item. Group means were compared and analyzed according to variance. P values (probabilities ranging from zero to one) were examined to identify possible areas of significance. P values close to or less than 5% (.05) were considered important (Everitt & Dunn, 2001). No significant differences among learning style preference groups were found for questionnaire items other than 1, 12, and 17. For these items Least Squares Means (regression analysis) was used to look more closely at the items in question and model the numerical data. Figure 5 displays results for these questionnaire items. ANOVA and Least Squares Means analysis of questionnaire data resulted in the following important findings. (Appendix D lists Least Squares Means data for questionnaire items not found to be statistically significant.)

The lower the Reflective Observation score, the more students agreed that the points afforded the wiki project were equal to the requirements of the project. Similarly students with high Reflective Observation scores strongly disagreed they felt it was necessary to meet face to face to complete wiki work while students with middle and low Reflective Observation scores believed it was necessary. The higher the Reflective Observation score, the more students strongly agreed they felt comfortable with the contributions of their group members. The lower the Reflective Observation score, the more students strongly disagreed they felt comfortable with the contributions of their group members.

Active Experimentation learners revealed opposite results from Reflective Observation

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learners in terms of how comfortable they felt with the contributions of their group members. The higher the Active Experimentation preference score, the more strongly these students disagreed they were comfortable with the contributions of their group members. The lower the Active Experimentation preference score, the more strongly these students strongly agreed they felt comfortable with the contributions of their group members.

No significant findings were revealed for the Abstract Conceptualization preference based on the Likert Scale Questionnaire data.

(Insert Figure 5 here.)

As indicated on the Likert Scale Questionnaire, most students worked solely in the online space, were proud of their contributions to the wiki, and felt the collaborative document was well written due to writing and editing within the wiki space. Students' responses to open ended questions (What has been particularly helpful for you in use of the wiki? What in particular hindered your work with the wiki? What would you like to see continued? What would you like to see changed?) provided further information concerning their experience with the wiki. Responses to these questions fell into three categories: constructing knowledge of reading instructional approaches, social practices within the wiki environment, and use of technology. The responses are included in the discussion which follows.

Discussion and Conclusions

Research question 1: *Did learning style preference have an effect on use of the wiki?*

Though the wiki was selected to address all four learning preferences, students with high Abstract Conceptualization learning style preference scores performed better on the wiki tasks. These students had a higher number of contributions to the wiki, perhaps because specific tasks

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associated with the wiki including reading and research prior to posting, seeking information from authoritative sources, and integrating information into a formal document aligned closely with preferences of Abstract Conceptualization learners. Students with high Reflective Observation preferences did not perform as well on the wiki project as did Abstract Conceptualization learners. While affordances of the wiki aligned with characteristics of Reflective Observation learners, these students did not contribute to the wiki to the degree Abstract Conceptualization learners did, though they indicated they enjoyed working in the wiki environment and felt comfortable with their contributions to the wiki document.

Though active work in a purposeful activity with domain specific content was meant to support the learning style preferences of Concrete Experience and Active Experimentation, students with high scores in these preferences did not contribute as often to the wiki. The higher the Concrete Experience preference score, the more poorly these students performed. The lower the Active Experimentation score the more strongly these students disagreed that they were comfortable with the contributions of their group members. This may suggest the wiki was not viewed as an authentic learning event for these students and that the hands-on nature of the experience and collaboration with peers in the environment may not have been viewed as real-life tasks of professionals in the field of reading instruction. This may suggest not just the wiki experience as a whole, but specific tasks to be completed on/with/through the wiki need to be aligned with learning style preferences.

Research question 2: Did use of the wiki increase understanding of the social nature of literacy?

The wiki was also selected to help students understand the multiple realities and discourses represented in groups, an important consideration in reading instruction and integral to selection of methods. Twelve of seventeen students indicated on the questionnaire that the

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wiki provided a space for effective collaborative work. While students also commented on what it was like for them to work in the collaborative wiki environment, no one made connections to multiple realities and discourse patterns represented in groups as factors affecting reading instruction and learning.

Students' comments about the social practices within the wiki environment most often related to how their work was received by others. Students commented, "It has been particularly helpful to be able to edit things after I'm able to think about them and to allow others to edit my work with their input" and "I think the wiki assignment was good in that it let me work on my own time schedule. I also found that if I was stuck on an idea I could just check back later and see what the other group members had added." Others expressed concern about their level of confidence in contributing and editing the work of others. Their concerns were expressed in these ways: "Not being 100% confident with my writing/ideas and not being able to talk about them with other group members," "I only posted a few times because when I would go to add information, I could see some had already been added on the same topics. My group members could write very eloquently the first time and I saw it unfair to erase their hard work," "Hard for students to contribute equally and don't want to offend group members by changing something because they find that very important," and "Hard for some individuals who are less assertive."

Other comments about the social space included reference to meeting in the space. Students wrote: "It was helpful that it was a group project that didn't require much meeting time," "Being able to edit my work at my own pace and on my own time schedule," and "I would like to see who contributed what in my group, so if I changed things, I would know who to ask."

Responses to the open-ended questions indicate that for some students in the wiki project,

camaraderie mediated against their desire to make changes in the wiki document, and affected the purposefulness of the wiki exercise. Cultural practices and power structures were a part of the social practice of literacy (Street, 1993) and were evidenced in students' participatory practices in the wiki environment. Students' sense of agency, or power to act, was hampered, as evidenced by students who viewed particular students as leaders, and as a result made choices about not correcting their peers' work. In viewing particular students as leaders and others as friends, students' perceptions of their own roles and responsibilities in the construction of knowledge through the wiki environment were affected. Neither individual accountability (participation) nor the overall group project (the artifact) overpowered this sense of not wanting to correct or change the work of their peers.

Though the wiki project provided experiences related to the social nature of literacy, students did not connect this experience to reading instructional practices on their own. Further scaffolding is needed to support students' construction of knowledge concerning this component of literacy instruction.

Research question 3: Did use of the wiki increase understanding of reading instructional practices for students with various learning style preferences?

'Learning from, learning about, and learning to' (Andriessen et al, 2003) characterize the students' experiences as expressed by them in their reflections. While some students indicated through narrative comments they learned about reading instructional approaches from this experience and others about technology and how to use it, their comments did not vary greatly according to learning style preference. However, the Principal Component Analysis of all variables in the research, which included students' learning style dimension scores, number of wiki posts, and wiki project scores, indicated the higher the Abstract Conceptualization

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preference score, the better students performed. The higher the Concrete Experience score, the more poorly students performed.

Students' comments about wiki technology were associated with their own level of confidence in use of technology and frustrations with editing: "I am not very good at using technology, so it was hard for me to write in it and know the commands of how to make something bold, and how to display pictures—like the concept map." Others commented positively on the capabilities of the technology in displaying information, in allowing asynchronous work, and supporting collaborative work. Still others were excited to learn how to use a wiki and perhaps use it in their future teaching. Again, the students' narrative comments did not vary greatly according to learning style preference. (See Appendix C.)

Research Question 4: Did use of the wiki support students' ability to construct knowledge in the context of the reading methods course?

Responses to open-ended questions indicate students learned about reading instructional approaches as a result of the wiki project. Students who believed the wiki was helpful in constructing knowledge of reading instructional approaches in this environment said seeing all the information together was helpful, learning more about and looking in depth at their particular approach was helpful, and researching their approach was enjoyable. Assimilation and accommodation were a part of the collaborative writing process, though students did not talk about these in their written reflections on use of the wiki in the construction of knowledge.

Five of seventeen students specifically noted in their narrative comments that they learned about reading instructional approaches and that the wiki was instrumental in learning this content. Two examples follow:

I feel that I greatly improved my knowledge of my strategy and it helped to see

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other people's point of view and what they saw as important for the approaches.

I feel this assignment was very helpful to my understanding approaches to reading instruction and strategies because it made me really analyze what was important about the approach and what was not important. It made me analyze how the different strategies and approaches differ and why they differ.

Three students expressed frustration with the wiki in their narrative comments: "I felt like we had discussed the topic in sufficient detail in class," "This assignment seemed more like busy work than providing any academic benefits," and "we have talked about ALL of this before."

Four of seventeen students who completed the questionnaire stated the wiki had helped them learn more about writing and twelve of seventeen said they gained ideas on how they might use the wiki to support writing in an elementary classroom.

Future Wiki Work

Some challenges in use of the wiki were identified in this research project including supporting students' consistent participation in wiki work over the course of the project, helping students recognize expectations of wiki work, and assisting students in demonstrating skills necessary for quality work in the wiki environment.

Continued wiki experiences (Sorenson & Murchu, 2006) in conjunction with a scaffold of discussions throughout the course of the wiki project, instead of just at the beginning, will help to address these challenges. Scaffolds of ongoing discussions may focus on social construction of knowledge (using participants' contributions as prompts), negotiation of the wiki space (addressing issues of power), and expectations for wiki tasks (including individual and

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group responsibilities). Sensitivity to preservice teachers' perceived roles and relationships with peers in the course may be addressed with discussions about the positive and limiting effects of peer relationships in collaborative work. Differences in preservice teachers' abilities to use and troubleshoot technological applications may be addressed through additional help sessions and encouraging them to ask for help when needed.

Making competencies explicit, providing opportunities to practice such competencies, and having preservice teachers reflect periodically throughout the wiki project on their contributions may support preservice teachers with various learning style preferences and serve as a scaffold for their success. Wiki competence, the ability to function successfully in the wiki environment, similar to practical social competence (Whitson & Stanley, 1996) requires a praxis in which preservice teachers consider their personal work in relation to larger social processes.

Wiki competence involves skills in close reading, critical thinking, and reflection—or in other words—how to challenge the work of other writers/contributors. Such competence will involve making decisions as to when to correct, add to, delete, and or write over (rewrite) the work of others. Such decisions are precipitated by being informed about the topic at hand, knowing the importance of having accurate (including multiple perspectives) information available in online environments, and being respectful of contributors while not being silenced by the position or perceived status of other contributors.

Cognizance of the effects of interactivity and intersubjectivity is important as learners work with others in constructivist environments, such as the wiki. Discussions on the similarities and differences between wiki work and other collaborative ventures will help preservice teachers see that roles are many, varied, and shifting. For example, while one may act as a leader in posting initially to the wiki, others become leaders through additional posting as well as through

editing. In other words, one preservice teacher is not responsible for posting and another for editing. Similarly, encouragement within the collaborative process may not be the role of one group member. Rather, it may be an outcome of viewing contributions which include elaboration, change, or deletion as processes in creating an accurate, detailed account or report. Encouragement may also be a prompt in the form of deciding when more research is needed to make further contributions to the wiki. The need for further contributions may be based on the status of the current document and or may be the result of fewer contributions than other group members. Preservice teachers' evidence or data for their theoretical arguments (McCarty & Swandt, 2000; Philips, 2000) and for their knowledge claims should replace their ambivalence over editing peers' contributions.

Development of intellectual dispositions that support preservice teachers' confidence, initiative, and ability to engage in dialogue and collaboration within the wiki environment will strengthen wiki work as content is investigated, discussed, analyzed, and rearticulated with others in constructivist settings.

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Figure 1: Kolb learning preferences and learning styles

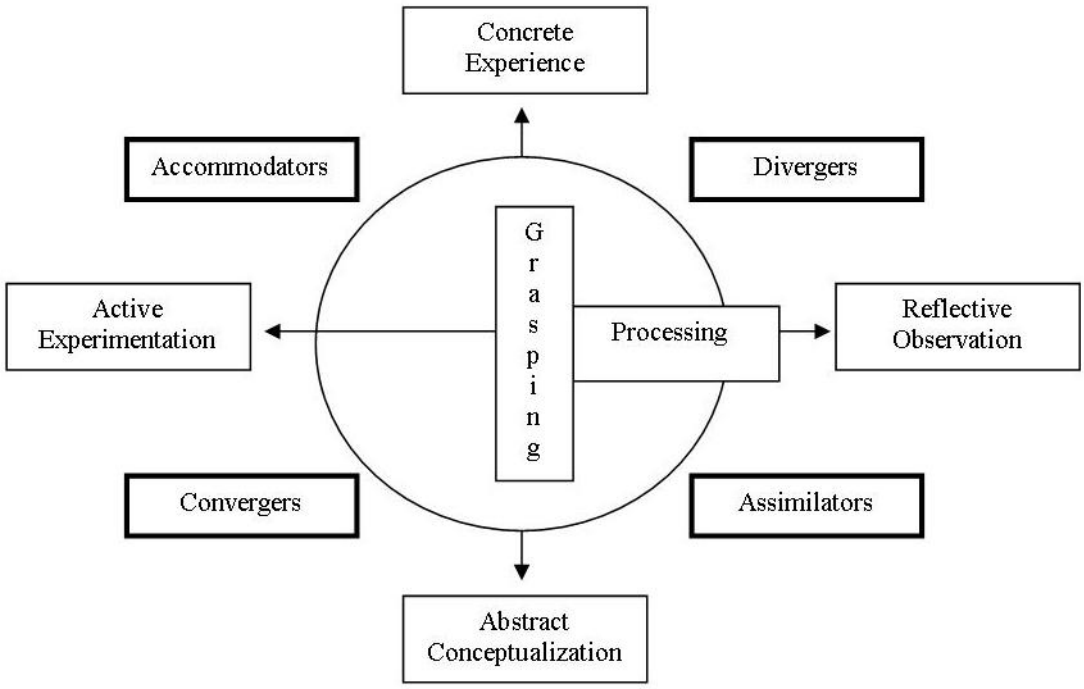


Figure 2: Biplot of standardized principle components—Learning style preference scores, wiki posts, and wiki project scores

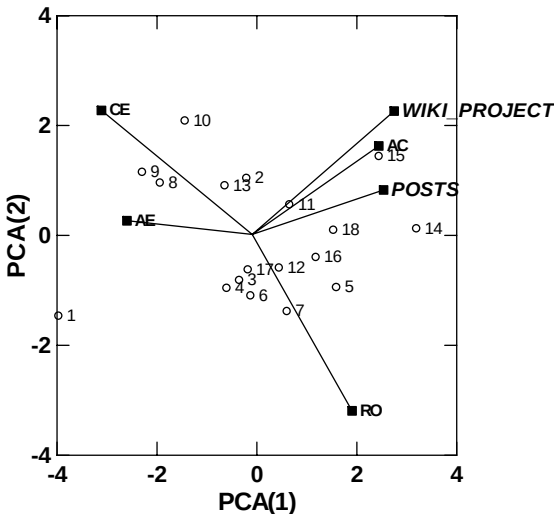


Figure 3: Number of wiki posts

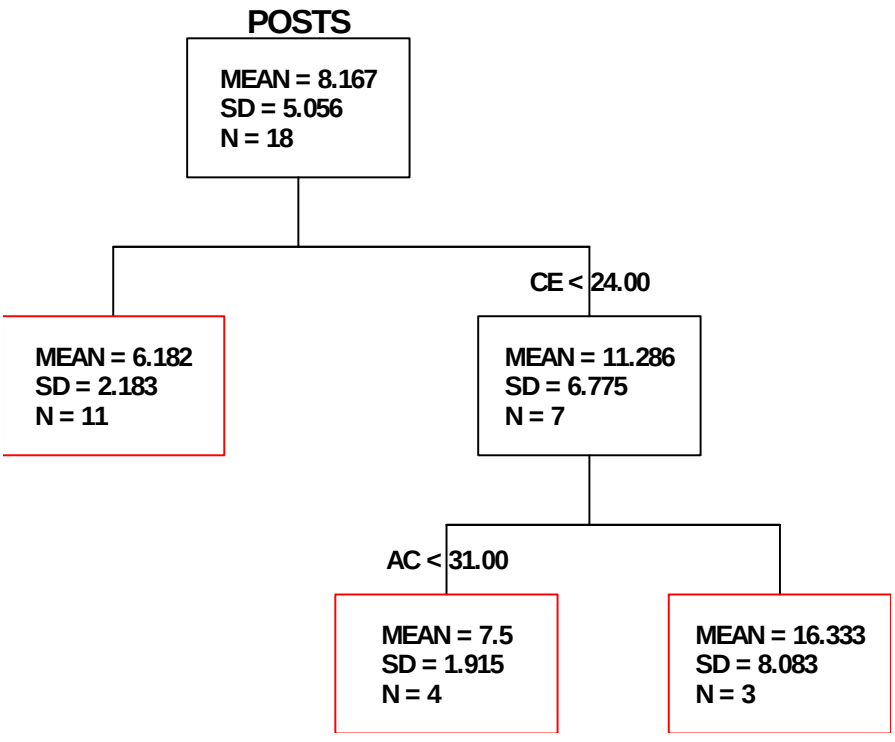


Figure 4: CART—Wiki project score

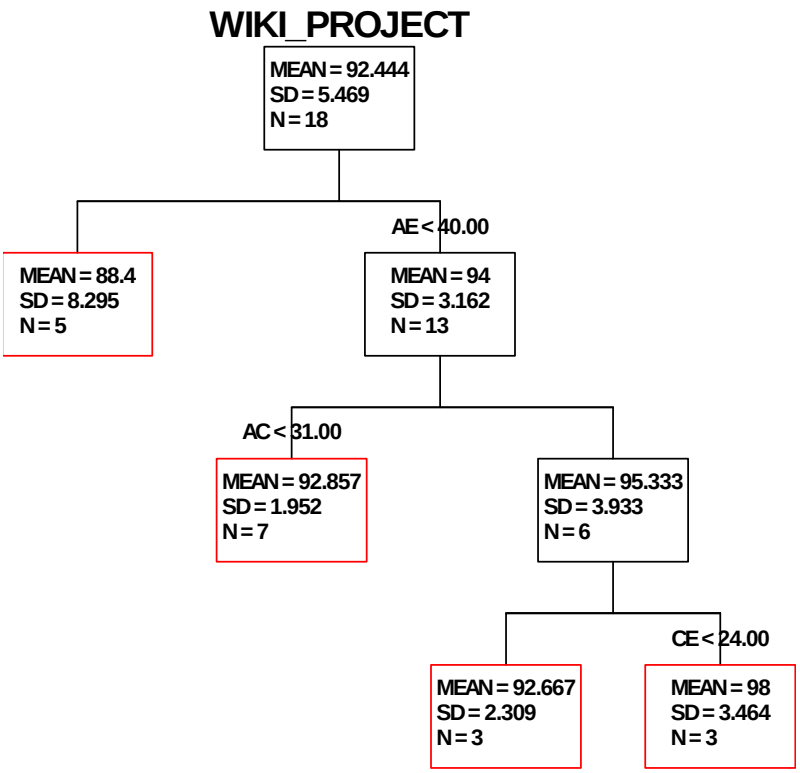
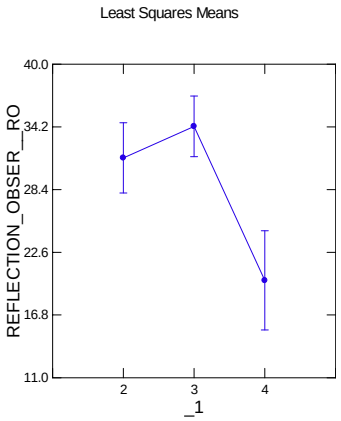


Figure 5: Questionnaire items and least squares means

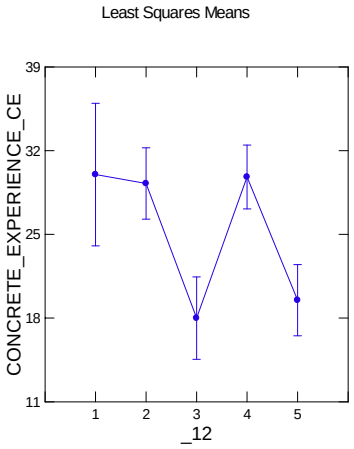
Questionnaire Item #1		
Source	**Mean Squares**	**p-value**
CE	102.964	0.165
RO	223.348	**0.057**
AC	21.441	0.640
AE	11.798	0.514

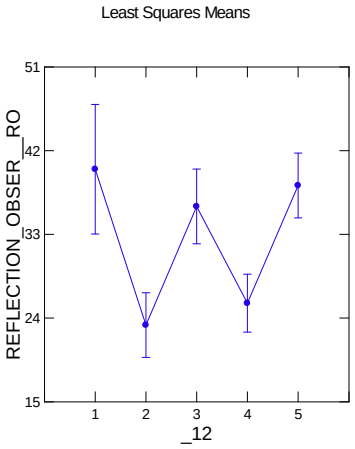
I believe the points afforded the wiki project were equal to the requirements of the project.



Questionnaire Item #12		
Source	**Mean Squares**	**p-value**
CE	119.980	**0.045**
RO	187.707	**0.030**
AC	58.816	0.253
AE	15.880	0.460

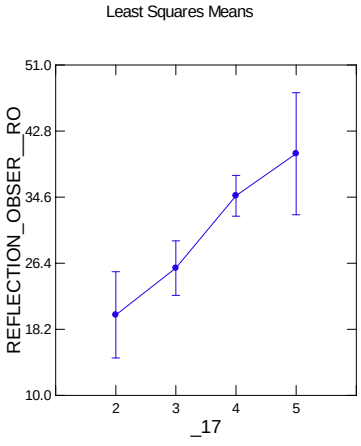
My group members met face to face _times to work on the wiki. I felt this was necessary to complete the project well.

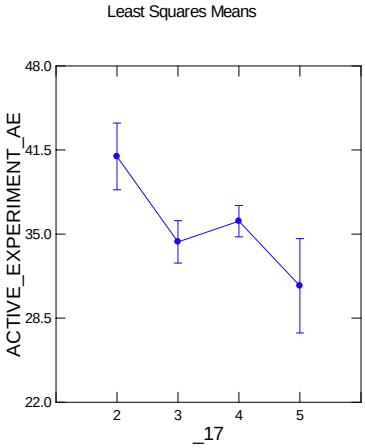




Questionnaire Item #17		
Source	**Mean Squares**	**p-value**
CE	128.927	**0.058**
RO	195.058	**0.051**
AC	58.227	0.272
AE	29.090	0.139

I was comfortable with the contributions my group members made to our wiki document.





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APPENDIX A: Wiki Assignment Checklist

Wiki Assignment

Name_____

Individual Posts on the Wiki _____

Group Score on the Wiki _____

The Report on a specific approach to reading instruction

Approach is described accurately.

Use of the approach in the classroom is clearly explained.

Materials needed for reading instruction using this approach have been identified.

Grouping of students has been described.

Assessment of students is clearly described.

Additional information on the reading approach has been included.

References have been cited.

Individual contributions to the wiki assignment have been frequent and consistent from beginning to end in the project.

Individual contributions have been integral to the collaborative project.

The Strategy:

The strategy addresses one of the five building blocks of effective reading instruction.

The strategy is clearly explained.

Information is shared as to how the strategy fits within the specific approach to reading instruction.

The Concept Map:

The concept map includes important components of the approach to reading instruction.

The concept map has been uploaded to the discussion board.

Reporting:

All group members participate in the presentation of information.

Group members draw others into the discussion with questions and examples.

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APPENDIX B: Likert Scale Questionnaire

Wiki Questionnaire

Name _____

Learning Style Preference Scores: AC___ AE___ RO___ CE____

	1 Strongly Disagree	2 Disagree	3 Not Sure	4 Agree	5 Strongly Agree
I believe the points afforded the wiki project (65) were equal to the requirements of the project.					
There was sufficient time to complete the wiki project.					
I asked for and received help when needed to complete the wiki project.					
The expectations for the wiki project were clear.					
The wiki provided space for effective collaborative work.					
I was able to easily understand and use the wiki tools for writing and editing.					
Our collaborative project is well written due to writing and editing within the wiki environment.					
I enjoyed working within the wiki space.					
Knowing that statistics on participation could be viewed positively affected my participation in the project.					
I worked mostly online with my group members.					
My group members could have completed the project all online without face to face meetings.					
I learned more about writing because of this experience.					
I learned more about the approaches to reading instruction because of this wiki project.					
I have gained ideas on how I might use the wiki to support writing in an elementary classroom.					
I would like to see the wiki used for more collaborative projects in my coursework.					
I was comfortable with the contributions my group members made to our wiki document.					
I was comfortable with the changes my group members made to our wiki document.					
I am proud of my contributions to the wiki project.					

What has been particularly helpful for you in use of the wiki?

What in particular has hindered your work with the wiki?

What would you like to see continued?

What would you like to see changed?

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APPENDIX C: Likert Scale Questionnaire: Responses to Open Ended Questions Sorted by Students' Highest Learning Style Preference Scores

What has been particularly helpful for you in use of the wiki?

CE 38—The program is fairly easy to use.
RO 40— n/a
RO 39—It was helpful that it was a group project that didn't require much meeting time.
RO 40—It has been particularly helpful to be able to edit things after I'm able to think about them and to allow others to edit my work with their input.
RO 40—It is a good overview of all of the approaches.
RO 36—Liked the layout with the directions of how to use the wiki.
RO 38—Able to brush up on my computer science skills.
AC 34—I felt that learning how a wiki worked was helpful. I felt like I learned a lot.
AC 35—I looked much more in depth at the literature based approach. I learned about a new technology tool.
AE 40—The wiki was really easy to use. It was nice because it was collaborative, but you could do it whenever you wanted.
AE 40—Getting to see all of the information together.
AE 40—Learning more about the literacy based approach has been interesting. Learning how to use the wiki has been one more tool, I have learned, to use technology.
AE 42—The texts used, easy to get in.
AE 34—Being able to work on it at my own pace and on my own time schedule.
AE 36—Seeing other people's writing styles and learning technology on the internet.
AE 36—I like that it was relatively simple to add to.
AE 38—n/a

What in particular has hindered your work with the wiki?

CE 38—Map was a little difficult – thank you! ☺
RO 40—I could not find the area where you could see everyone's different contributions.
RO 39—It was kind of a pain to have to reread everything each time, because I didn't know what people changed/added.
RO 40—I wasn't completely sure of all the expectations for each part.
RO 40—The editing system is problematical, with 20 people editing during the same time period things overlap and are lost.
RO 36—Things would happen to our writing like underlining and repeating sentences.
RO 38—Felt like we had discussed topic in sufficient detail in class. Wiki frustrating because changes didn't always save or random things would appear in section.
AC 34—I felt hung up because I felt like it was a race to get information up onto it.
AC 35—The expectation to alter and change others' quality work just for the sake of changing it for an assignment.
AE 40—Not being 100% confident with my writing/ideas and not being able to talk about them with other group members.
AE 40—It was difficult not knowing some of the things that it does or what to do when you get error messages.
AE 40—I only posted a few times because when I would go to add information, I could see some had already been added on the same topics. My group members could write very eloquently the first time and I saw it unfair to erase their hard work.
AE 42—My computer background
AE 34—Changes being made that I didn't agree with. I felt there wasn't a discussion.
AE 36—Constant editing by people so sometimes the changes that I made got erased and it was difficult to get them back.
AE 38—There were parts that I didn't know what to do such as bold and italicized, it took a while for me to learn and I think it should have been in a different and easier format.

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What would you like to see continued?

CE 38—I think the project as a whole is good and should be continued.
RO 40—I enjoyed the research aspect of working on the wiki. It was interesting to learn new strategies.
RO 39—It was a good experience to use for this class in the future – next year.
RO 40—I like that a group of students work on it together.
RO 40—Group collaboration
RO 36—I thought it was good to learn how to use wiki.
RO 38—Enjoyed opportunity to experiment with Inspiration to create concept map.
AC 34—I would love to see the wiki continue on – I think it is a good skill to practice and understand.
AC 35—The expectation to delete
AE 40—I like the wiki project because you really learn about your approach.
AE 40—The project should be continued. It was helpful.
AE 40—I understand getting to use the wiki, I just wish the stakes were not so high, grade wise, because I feel I did not get to contribute equally because people added all the information right away.
AE 42—The use of the wiki.
AE 34—I liked that I was able to chose the topic I wanted to work on.
AE 36—Work with technology.
AE 36—This is a good forum for collaborative work.
AE 38—n/a

What would you like to see changed?

CE 38—Perhaps a little more discussion in class about parameters. Hard for some individuals who are less assertative – they are uncertain of their contributions – afraid to make changes. [Student's name] – plus she has been sick on and off recently.
RO 40—As a group we should have met face-to-face but I think because no actual time was set, no one took the initiative to set up a time. I fell that meeting as a group would have been helpful.
RO 39—I understand why we changed the points. but I do not feel that there was opportunity to do 65 pts. here in the wiki. I feel like it was a lot of work but 65 pts scares me.
RO 40—Maybe a more thorough description of expectations.
RO 40—If each group had a different wiki it would solve some of the overlapping issues.
RO 36—Not have to post everyday.
RO 38—Don't put such a large point value on assignment because doesn't accurately represent work. Also, I know this was to show another type of technology but this form was too frustrating. I wouldn't use with students because don't have technological skills or level of ability to deal with things that go wrong. This assignment seemed more like busy work than providing any academic benefits. Class discussion didn't seem to have much benefit. Most students not totally paying attention. Hard for students to contribute equally and don't want to offend group members by changing something because they might find that very important.
AC 34—Maybe have groups meet mandatory to split up parts equally and once everyone has their specific part up letting the free for all changing up the wiki continuously begin. I just felt like I was running out of big chunks of information to write about and I could help revise but that was about it.
AC 35—It was overwhelming to be expected to contribute to the wiki daily, and I couldn't always find time everyday to research quality material and revise the wiki. I felt like I was expected to edit and revise some high quality writing done by my group members, just for the sake of the assignment.
AE 40—It would be nice to know who wrote what. Then you could ask or talk to the person directly if you have questions or comments.
AE 40—Explain more how to upload items and different accessories.
AE 40—I would like to see it worth less and take a smaller amount of time. Also, I would rather have some sections assigned so everyone has a fair opportunity to contribute because I became a little frustrated at times.
AE 42—Move explanation of how to make changes, etc. Not have to post everyday. Examples.
AE 34—I feel that having all the topics in the same editing box made it confusing. I would have like to be able to

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open and edit only mine.

AE 36—Possibly individual or smaller groups (like 2, maybe 3 people) for wiki assignments.

AE 36—As much as technology is necessary, my dislike of technology use definitely hindered my work with the wiki. I would have liked to see who contributed what in my group, so if I changed things, I would know who to ask. I would like to see who did what. I had the feeling of being behind because I couldn't see who was doing what. With this project it greatly decreased the face-to-face interaction of the collaborative group.

AE 38—I did not like the wiki assignments at all. I would have rather met in person because I like to be interactive with my peers. I think that this should be more group face-to-face oriented because there were many times when I would prepare information and go to edit our site and someone would have just added on to the exact part that I was going to do. I thought that this was unfair because I could only add very little to the project. I would feel bad just deleting everything that the last student had wrote, especially since it was almost exactly the same as what I had. I really disliked using the wiki. I think that the wiki should not be used anymore in class because I feel that I did not learn anything from this project and also from the presentations. We have already talked about ALL of this before.

APPENDIX D: Survey Data for Questionnaire Items Not Found to Be Statistically Significant

Questionnaire Item #2		
Source	**Mean Squares**	**p-value**
CE	47.021	0.379
RO	11.863	0.719
AC	2.966	0.803
AE	2.754	0.695

There was sufficient time to complete the wiki project.

Questionnaire Item #3		
Source	**Mean Squares**	**p-value**
CE	72.265	0.298
RO	66.554	0.534
AC	42.936	0.429
AE	33.599	0.086

I asked for and received help when needed to complete the wiki project.

Questionnaire Item #4		
Source	**Mean Squares**	**p-value**
CE	58.693	0.423
RO	27.757	0.890
AC	29.846	0.655
AE	2.926	0.964

Replacing the third course exam with more time and points for the wiki was appropriate.

Questionnaire Item #5		
Source	**Mean Squares**	**p-value**
CE	65.914	0.345
RO	78.712	0.452
AC	62.769	0.234
AE	18.419	0.360

The expectations for the wiki project were clear.

Questionnaire Item #6		
Source	**Mean Squares**	**p-value**
CE	110.143	0.072
RO	43.282	0.772
AC	40.571	0.486
AE	2.343	0.976

The wiki provided a space for effective collaborative work.

Questionnaire Item #7		
Source	**Mean Squares**	**p-value**
CE	24.657	0.766
RO	78.283	0.455
AC	57.511	0.278
AE	11.223	0.601

I was able to easily understand and use the wiki tools for writing and editing.

Questionnaire Item #8		
Source	**Mean Squares**	**p-value**
CE	20.363	0.725
RO	30.892	0.717
AC	15.523	0.726
AE	30.872	**0.150**

Our collaborative project is well written due to writing and editing within the wiki environment.

Questionnaire Item #9		
Source	**Mean Squares**	**p-value**
CE	44.534	0.586
RO	161.341	0.073
AC	41.221	0.476
AE	7.909	0.795

I enjoyed working within the wiki space.

Questionnaire Item #10		
Source	**Mean Squares**	**p-value**
CE	39.590	0.595
RO	85.710	0.409
AC	73.261	0.163
AE	12.924	0.537

Knowing that statistics on participation could be viewed positively affected my participation in the project.

Questionnaire Item #11		
Source	Mean Squares	p-value
CE	60.490	0.390
RO	43.048	0.711
AC	12.741	0.858
AE	6.392	0.794

I worked mostly online with my group members.

Questionnaire Item #13		
Source	Mean Squares	p-value
CE	44.816	0.539
RO	42.491	0.716
AC	32.056	0.570
AE	31.763	0.105

My group members could have completed the project all online without face to face meetings.

Questionnaire Item #14		
Source	Mean Squares	p-value
CE	5.302	0.921
RO	2.654	0.972
AC	8.541	0.840
AE	6.902	0.683

I learned more about writing because of this wiki experience.

Questionnaire Item #15		
Source	Mean Squares	p-value
CE	64.240	0.359
RO	14.926	0.927
AC	66.211	0.209
AE	6.032	0.808

I have gained ideas on how I might use the wiki to support writing in an elementary classroom.

Questionnaire Item #16		
Source	Mean Squares	p-value
CE	60.043	0.408
RO	130.666	0.169
AC	42.983	0.450
AE	16.901	0.421

I would like to see the wiki used for more collaborative projects in my coursework.

Questionnaire Item #18		
Source	Mean Squares	p-value
CE	7.194	0.894
RO	115.431	0.264
AC	11.233	0.794
AE	6.402	0.703

I was comfortable with the changes my group members made to our wiki document.

Questionnaire Item #19		
Source	Mean Squares	p-value
CE	65.378	0.336
RO	10.336	0.896
AC	40.084	0.423
AE	11.628	0.520

I am proud of my contributions to the wiki document.

Review by Rebecca McCarthy. Rebecca teaches courses in the Humanities for Kaplan University. RMcCarthy@Kaplan.edu

***Rhetoric and Composition: A Guide for the College Writer (*2005-Present)**

Free from WikiBooks at: http://en.wikibooks.org/wiki/Rhetoric_and_Composition, (172 pages to date), available in hyperlink, PDF, and "printable" platforms.

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"All Right, then, here's our Rhetoric and Composition wiki book. Much work left to do; but the longest book begins with a single edit!" – Matthew Barton, 27 April, 2005

There is a new way in which "Literacy and Technology" is intersecting with the college classroom . . . The wiki textbook. One such textbook, *Rhetoric and Composition,* was started in April, 2005, and was the brainchild of Matthew Barton, an assistant professor of English at Saint Cloud State University. Worried about the cost of textbooks, Barton came up with the idea of creating a free rhetoric and composition text, which would utilize the wiki platform, as well as the talents of anyone who wished to contribute to the project. In January, 2005, Barton posted a call on the *Kairos News Weblog*[4] looking for anyone interested in participating, while laying out his vision for a peer-reviewed community built wiki textbook on rhetoric and composition (Kairosnews-Contributors "A Free Composition Textbook" par. 1-9). His call met with little enthusiasm or interest in participation; consequently Barton started the process himself in April of that same year. However, as the summer of 2005 began to ebb, Barton again announced another progressive idea . . . if this textbook was to be made available to students, why not let the students help write the wikitext as a course project: "I've decided to conduct a rather risky experiment in my Computers and English course this semester: A semester-long class project whose goal is to create a free wikitext for use as a first-year composition textbook" (Kairosnews-Contributors "Class Project: Free Wiki Textbook" par. 1). With these two daring ideas came the

[4] A Weblog for Discussing Rhetoric, Technology and Pedagogy: http://kairosnews.org/.

award winning wiki publication of *Rhetoric and Composition.*[5] This review will briefly examine the wiki platform, origin, and culture, followed by a review of *Rhetoric and Composition.*

As defined by *Wikipedia,* a wiki "is a collection of web pages designed to enable anyone who accesses it to contribute or modify content, using a simplified markup language. Wikis are often used to create collaborative websites and to power community websites" (Wikipedia-Contributors "Wiki" par. 1). The first wiki (wikiwikiweb) was developed in 1994 by Ward Cunningham who intended his version of the "WWW" as "a collaborative database, dedicated to People, Projects and Patterns, in order to make the exchange of ideas between programmers easier" (Wikipedia-Contributors "History of Wikis" par. 15). Utilizing Perl programming,[6] Cunningham used the Hawaiian phrase "wiki-wiki," meaning "quick-quick," instead of calling his user friendly platform the "quick-web," meaning quickly viewed and edited (ibid). Wikis, however, did not gain public popularity until the introduction of *Wikipedia,* the free internet encyclopedia that can be edited by anyone, founded by Jimmy Wales on 15 January, 2001 (Wikipedia-Contributors "History of Wikipedia" par. 5).

Wiki texts are considered the most democratic mode of web based text creation because anyone with a computer and internet access can create, post, comment on, or edit a wikitext. This "democratic" mode of text creation can be understood in its "participatory" or "representational" forms. With a wiki "participatory" platform, anyone who chooses can post, create, and edit a wikitext. Thus, breadth and depth of knowledge and personal/political intent does not determine right to authorship or agency. A person with no knowledge regarding a

[5] *Rhetoric and Composition* has the distinction of being awarded the position of "Featured Book" by the *Wikibook* community: http://en.wikibooks.org/wiki/Rhetoric_and_Composition.

[6] "Perl" is a program language developed by Larry Wall and introduced in 1984. What makes Perl ideal for wikis is the fact that its text processes do not have limits on data lengths (Wikipedia-Contributors, Perl, 4 June, 2008, Electronic, Wikipedia, The Free Encyclopedia, Available: http://en.wikipedia.org/w/index.php?title=Perl&oldid=217032879 4 June 2008.).

specific subject, such as a wiki article on 18th century literature, can just as easily post or edit an article as, say, a professor who holds a Ph.D. on the subject. If information is incorrect and lacking support to validate claims, the wiki community of writers and enthusiasts rely on each other to "police" and to re-edit texts that are considered inaccurate or not supported. However, as the wiki became more fashionable, and the platform was used more frequently because of the popularity of *Wikipedia*, a more "representational" approach was adopted with many wikis where edits and articles had to be approved through a type of "peer review" process. As the *Academic Publishing Wiki* explains the process, the "first author of an article can designate an article as being available for the formal peer review process by appending the [peer review] template to the article" (Academic-Publishing-Wiki-Contributors par. 3).

Finally, it is helpful to note the relationship between wiki and the academic community. Like the rest of the internet community, academia has embraced wiki culture, albeit at a slower pace. At the core of this slow embrace is the problem of community creation, editing, agency, and authenticity/factuality. As more students have looked to *Wikipedia* for a source of information, there has been a valid concern regarding accuracy of information, lack of peer review regarding information, and, just as importantly, questions of subjectivity with wikis. Since *Wikipedia* (and other wikitexts) allows anonymous editing and creation of entries, there is no way, until recently,[7] to validate where information is coming from, whether that information is accurate and, whether credit has been given to the original author (questions of plagiarism). Regardless, the wiki platform is being utilized by the academic community in a variety of ways including: the Academic Job Search, Post-Doctorate Searches in the Humanities and Social

[7] Internet sites such as WikiScanner (http://wikiscanner.virgil.gr/) identify the URLs of Wikipedia editors, revealing, at least, the companies and locations of many editors. This new technology has uncovered the authorship/editorship of the US Government, Newspapers, Political Campaigns, and the like, revealing possible "intent" behind "agency."

Sciences, Academic Journals and Publishing, and now, an Academic Textbook ("Rhetoric and Composition: A Guide for the College Writer").

Rhetoric and Composition: A Guide for the College Writer is currently divided up into four main units: Stages of the Writing Process, Writing Applications, Advanced Topics, a Writer's and a Teacher's Handbook. Unit 1 examines what it means to be a "good writer," the writing process from planning, invention, collaboration, and researching, to drafting, editing, rewriting and publishing. Although a collaboratively written project throughout,[8] the first chapter introduces a fairly consistent casual voice to the text, which conveys an intimate conversational feeling. Like other handbooks on rhetoric and writing, such as Lunsford and Ruszkiewickz's *Everything's an Argument*, this wikitext also examines the origins of argument, including Aristotle's *Rhetoric*, but focuses more immediately on the praxis of writing. Part three on "Researching," is a an excellent section where the authors' link ideas such as crafting an argument to engaging a specific audience, to understanding that the sources chosen also help form and inform your audience (Barton et al. "Research"). However, Unit 1 also demonstrates how free access to authorship can disrupt a unified "voice" of a book. Part five, "Editing," includes a section on Richard Lanham's *Analyzing Prose* which reads more like a literary review than an instructional tool for undergraduate writing.

Unit 2, "Writing Applications," is an exceptionally helpful section, examining the different styles of writing: Descriptive, Narrative, Exposition, Evaluation and Argument composition. First, however, the authors include a useful section on how to decode writing assignments by being able to define and identify benchmark terminology such as:

[8] Although a collaborative project, Matthew Barton wrote a great deal of the original text, leaving intentional gaps for his students to fill and refine. The book, however, has grown from this point to included sections not originally conceived.

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"address/cover," "compare/contrast," "defend/justify," "illustrate," "list/enumerate," and other commonly used terms. The vocabulary overview is followed by detailed sections on writing styles, listed above, offering an overview on the style being examined, a how-to/step-by-step approach to the style that is both specific in terms of direction, but loose enough in its approach as to encourage the student room for creativity. Directions in these sections include the consideration of word use, imagery, and essay construction examples regarding the form of introduction, body, and conclusion paragraphs. Instructors will find helpful an insistence regarding the importance of a thesis statement, its use, construction, and placement in a text. Each style section is concluded by an example essay, and external internet links that offer further information. Although the sample essays are helpful, especially the evaluation and argument examples, students should be advised not to take these illustrations as the definitive word on the style.

"Advanced Topics" offers an in-depth look at writing for the humanities, the sciences, business, oral presentations, and rhetorical analysis. There is also a section on writing an annotated bibliography. Unlike the first two units of this work, Unit 3 starts out strong and then tends to become disjointed. The strongest segments are on writing for the humanities, sciences, business, and oral presentations—all of which rely on a consistent structure and a unified vision of the material being covered, including the type of writing used in the disciplines (interpretive, analytical, etc.), typical structure for the papers or speech, and external resources. Those entering the working world will find the section on business very helpful, since it contains information regarding letters of application, follow-up thank you letters, and resume writing. After the section on "Oral Presentations," however, there is a general lack coherency. The later added section on "Rhetorical Analysis" is short and misplaced within the book. The authors of

this added section would have served the work better by placing it in Unit 2, after the introduction. Further, the segment on writing the "Annotated Bibliography" is very helpful, covering both APA and MLA style, but again seems misplaced in the work as a whole.

The *Rhetoric and Composition* Wikibook currently concludes with the "Writer's" and "Teacher's" Handbooks. As pointed out by Barton in the comment area of the wiki, "we don't want to make grammarians out of people. Instead, they need to know just enough to stop from doing things that will detract from their ethos as writers" (Barton par 1). For the most part, the "Writer's Handbook" accomplishes this task nicely with sections discussing grammar, parts of speech, type of sentences, the active versus passive voice, the mechanics of writing, as well as common errors in writing and how to cite sources. The section on grammar offers a typical overview regarding the parts of speech, sentence structure, and the difference between an active and passive voice in composition. More helpful for undergraduate college students will be the chapter on mechanics that simply, but specifically, explains punctuation, followed by common misuses and errors, such as subject and verb agreements and sentence fragments. Unfortunately, the important final section on citations is not fully completed, documenting only the MLA style and, as of yet, it does not discuss in-text citations. The final chapter, "Teacher's Handbook," is the publication's weakest and most incomplete at this point in time. The hope is that it will be adopted and completed by instructors of composition and rhetoric.

As a whole, the current work is uneven when considered in the light of traditionally published textbooks; however, this should not detract from the work, nor should it keep instructors and students from utilizing this important resource. It must be remembered that like all wikibooks, *Rhetoric and Composition: A Guide for the College Writer* is a communal work in progress that is continuously being added to, revised, and edited. No longer a class project, the

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Rhetoric and Composition wiki has been adopted by several different writers, all striving to polish an already well conceived text. As such, it can be an excellent resource for college instructors and students, as long as those utilizing the wikitext also contribute to the self-regulating system of upholding the integrity of the work by policing attempts at text vandalization, and by giving back to the text through creation and editing.

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In *Race, Rhetoric, and Technology*, Adam Banks contributes significantly to scholarship at the intersections of literacy, technical communication, and African American rhetoric. He argues that African Americans have always had to struggle for technological access, and that, subsequently, an African American rhetoric of what he calls "transformative access" can add substantially to current conversations about technology and access. Banks focuses on the rhetoric of the "digital divide" to point out the limitations of previous and currents conversations about access, conversations that more often than not end up reverting to binaries—technology provides access or technological access is hindered—rather than moving toward a fuller understanding of the challenges surrounding issues of access and technology. For Banks, transformative technological access moves beyond the rhetoric of access as just consumption and instead allows for equity in the realm of technological production and ownership. A rhetoric that emphasizes a Black digital ethos, he argues, is the vehicle for moving both cultural and academic conversations in this direction: "mastery of individual technological tools and more general theoretical awareness comes together in what I argue needs to become a Black digital ethos—a set of attitudes, knowledges, expectations, and commitments that we need to develop and teach and bring to our engagement with things technological" (p. 47-49).

In positing a Black digital ethos, Banks opens up the realm of African American rhetoric and points to an important yet missing conversation in technical communication scholarship, discussions of race. In "Oakland, the Word, and The Divide: How We All Missed The Moment," Banks provides a critique of current conversations in disciplinary circles including composition and rhetoric, technical communication, and computers and writing. He points out that while national conversations during the 1990s focused on what was to become known as the digital

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divide, which he defines as "a concept to acknowledge the systematic differences in technology access that African Americans, other racial minorities and those in rural areas experienced" (12), English departments were once again debating Ebonics while questions of race and technological access were more or less ignored there and elsewhere in the academy. Furthermore, the emphasis on an oral rhetorical tradition, compiled with the stereotype that African Americans "just don't 'do' science and technology" (p. 21), has led to little serious attention to technology discussion even among the scholarship of African American rhetoric. For Banks, however, technological access should be "the key ethical issue that must drive all of our conversations about technologies and their relationship to written communication" (p. 20).

Banks calls on his audience to recognize the digital divide as a "rhetorical problem" that reduces the problem of access to an issue only of "connectivity" to computers or the web rather than a recognition of the significant systematic and material inequalities that exist. In his critique of current conversations about access, he argues that we need to recognize issues of access as so much more than just connectivity. "Beyond the tools themselves," he writes, "meaningful access requires users, individually and collectively, to be able to use, critique, resist, design, and change technologies in ways that are relevant to their lives and needs" (p. 41). Banks keenly observes the need for multiple levels of access to exist if change, and thus true access, is to actually occur. To complicate our limited understandings of access, he identifies four kinds of access that need to be addressed: material access (ownership and/or proximity in order for use to occur), functional access (the knowledge and skills needed in order to use technology once material access is realized), experiential access (meaningful and relevant use), and critical access (the ability to question and "resist" technology when needed (p. 41-42). Certainly, one of the most insightful contributions Banks offers with this text, these levels of access provide a useful

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theoretical framework for repositioning conversations about access in both educational and public debates.

In remaining chapters, Banks offers critiques of exclusionary technological structures as well as examples of how African Americana might move toward transformative access via a Black digital ethos. He begins with a discussion of Martin Luther King, Jr. and Malcolm X, suggesting that both civil rights orators use a Black digital ethos to further the cause of African American struggle in the 1960s. In "Taking Black Technology Use Seriously: African American Discursive traditions in the Digital Underground," he performs a contemporary analysis of African American discourse patterns on the Internet site BlackPlanet. He demonstrates how African Americans users access BlackPlanet in meaningful ways, resisting the ways in which cyberspace has developed as a White cultural construct. Both chapters impress upon readers the ways in which, as Banks reminds us, African American struggle has always come up against issues of technology and how African Americans, therefore, have always had to manipulate it and appropriate technology in order to claim meaningful access.

The next chapter, "Rewriting Racist Code: The Black Jeremiad as Countertechnology in Critical Race Theory" introduces the American legal system as a technological construct. Banks argues for the jeremiad as a rhetorical form that disrupts the racist discursive conventions of our legal system. He cites use of the Black jeremiad by Harvard law professor Derrick Bell in *And We Are Not Saved* as an example of one such disruption, suggesting that "form is every bit as important a site of protest as content" (p. 104) when it comes to enacting transformation. While I would have liked less discussion of Bell's particular use of the jeremiad and more discussion as to how this rhetorical form might be used to counter other racist technologies and make arguments for access, I appreciate how Banks challenges our assumptions concerning what

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constitutes technology in this chapter. In foregrounding legal discourse as a technology, he makes transparent the relationship between language and knowledge—that is, that language shapes and structures how we come to know.

Chapter six, "Through this Hell Into Freedom: Black Architects, Slave Quilters, and an African American Rhetoric of Design," furthers his attention to form with a discussion of visual rhetoric and design. As important as it is to critique exclusionary technological constructs, the struggle for meaningful access also demands equity in the realm of design and policy making, Banks point out. Demonstrating that access is a rhetorical problem as much as it is a material one, he puts forth design as an important rhetorical element that can assist in realizing access for marginalized groups. In doing so, he etches an African American rhetoric of design that pulls from African American architecture and Black quilters. With these two examples of African American design, Banks points to a tradition of design in African American culture, a legacy of design that historically provided—and, he argues can continue to provide—avenues toward transformative access for African Americans. Banks closes his book with a call to reconsider the role of technology within the history of African American rhetoric. Specifically, he argues for a digitalization of the African American tradition, extended analysis of racial constructs online, a recognition of technological access as a major trope within African American rhetoric, and an acknowledgement of the importance of design within African American rhetoric.

Banks' analysis deftly illustrates how African Americans have historically engaged issues of technology, making a compelling argument for the importance of conceiving a technological African American rhetoric. In doing so, he successfully demonstrates that to put forward the Black experience as tied to technological struggle is not to essentialize Black identity; instead such group identification is essential for transformation to happen. And while his main purpose

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is toward reshaping the African American rhetorical tradition, his theorizing on access provides a necessary complication to broader debates concerning the value of technology, particularly in light of recent arguments that link technology and literacy to the rise of the knowledge economy.

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Race, rhetoric, and technology: searching for higher ground.

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