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Cloud composition technologies in multimodal composition program documents

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Cloud composition technologies in multimodal composition program documents

by

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Program of Study Committee:
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The student author and the program of study committee are solely responsible for the content of this thesis. The Graduate College will ensure this thesis is globally accessible and will not permit alterations after a degree is conferred.

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ABSTRACT

Writing programs at numerous universities—including the Georgia Institute of Technology, Iowa State University, Miami University of Ohio, Virginia Tech, and Purdue University—are incorporating more learning about multimodal communication into their curricula, including written, oral, visual, and electronic communication (WOVE). Within WOVE, electronic technologies enable students to produce, distribute, and consume written, visual, oral, and electronic communication (Ong 1982; Bush 1945; Eisenstein 1979, Lauer 2009, 2014). Integrating cloud technologies into writing programs may be difficult because it requires ongoing training, support, and maintenance, but it may be worthwhile because it helps produce a writing culture mediated by these technologies. I use activity theory (Kaptelinin & Nardi 2006, Russell 1997) to argue that participant *techne*—as the knowledge of an art with a focus on the method of production—is an influential component of cloud-supported composition culture. And I demonstrate how cloud technologies may be written into course overview documents with modularity and social information.

keywords: writing program administration, technology, cloud, pedagogy, communication, composition, multimodal, genre, activity, documents

INTRODUCTION TO TECHNE IN TEACHING LANGUAGE ARTS

The WOVE curriculum in multimodal composition programs unifies the teaching and learning of language arts that became fragmented in the 20th century. In the early 20th century, English departments supported faculty in literature, composition, and speech communication. Literature faculty often held the most established positions in the department and received the most institutional, monetary, and social support. Looking to strengthen networks for composition, composition faculty created their own professional organization in 1911 and called it the National Council of Teachers of English (NCTE). Initially, speech communication faculty also joined the NCTE, but some later felt underserved by the organization. As Martin Medhurst explains, "[J]ust as the composition teachers had found themselves treated as second-class citizens by their literary colleagues, so the speech teachers soon found themselves marginalized by teachers of composition" (27). In 1914, a group of 15 speech communication professors walked out of the NCTE to begin their own organization and called it the National Association of Academic Teachers of Public Speaking which currently operates as the National Communication Association.

In the 20th century, composition faculty further developed their scholarly identity by engaging in the theory and practice cycle around learning written composition and teaching written composition. Composition faculty theorized the function of the rhetoric classroom in the education system and the national culture. Composition faculty approached their work from all three major epistemological paradigms: Objectivist, Subjectivist, and Transactional (Berlin 1987). In the 1970s and 1980s, composition faculty used empirical methods and cognitive process methods (Shaughnessy 1977, Sommers 1980, Perl 1980, Lunsford 1979, Flower & Hayes 1981). In the 1980s and 1990s the discipline moved the research focus toward theories of

audience (Lundsford & Ede 1990, Kroll 1984, Park 1982), collaboration (Bruffee 1984, Lundsford & Ede 1990, Spear 1988), and critical pedagogy (Bizzell 1992, Duffelmeyer 2002, Freire 1996).

During the same period, speech communication faculty developed a scholarly identity by engaging with the pragmatics of teaching speech communication in the classroom. Casey White suggests that, "research in first-year public speaking classrooms focuses more on pragmatic rather than theoretical issues" (21). Speech communication faculty focused their scholarship on assessment (Meyer & Hunt 2011; Pearson, et al. 2010; Reynolds, et al. 2004), speech apprehension (Hodis & Hodis 2013; Dwyer & Fus 1990), course objectives (LeBlanc et al. 2011; Williams 1997), and teacher training (Quigley et al. 1998; Hendrix 2000).

Composition and speech communication faculty have developed markedly different disciplines with different approaches to research and classroom practice. Speech communication courses tend to be more standardized, provide more rigid assignment instructions, use grading syllabi, and assess the speech as a product that is completed once it is performed (White). Written composition courses tend to resist standardization, use more minimalist assignment prompts, favor more personalized written feedback, and assess composition as a process that builds on itself with each successive assignment (White).

Schools including the Georgia Institute of Technology, Iowa State, Miami of Ohio, Purdue, and Stanford have developed multimodal communication courses that teach written, oral, visual, and electronic composition (WOVE). These courses acknowledge the interrelatedness of alphabetic literacy with other oral, visual, and electronic communication. These courses teach students how to analyze and compose in each mode of communication. In addition to analysis and composition, these courses try to develop in students the flexibility to

work in and among the modes. Multimodal classroom practice helps students learn to choose which mode is appropriate for the communication situation (Kress 2010, Lauer 2009); offers students a way of learning how these modes manifest in their life experience; and prepares students to think in multimodal ways in future communication situations.

The electronic component of WOVE is isolated in this thesis because it is an influential mode in communication situations in university, professional, and social life. Students often must use computers to access course materials, complete coursework, and participate in class discussions. They must use database-driven systems to pay their university bills, register for classes, find books at the library, and find resources on campus. They must use electronic systems to enter their dorm buildings and pay for their meals. And they use cloud services such as Twitter, Facebook, Instagram and Snapchat to socialize and share their lives with others.

Voices in digital rhetoric and the digital humanities have called for scholarly attention to the electronic mode of communication. Cynthia Selfe encourages the field not to ignore technology because the material dimensions of textural production are dimensions that will remain with us regardless of the form they take (1999a, 1999b). Kathleen Blake Yancey encourages the field to see pedagogy as focused on the student as well as the means of production (2004). Clare Lauer encourages the field to teach more visual and electronic communication to meet the demands of contemporary communication situations (2009, 2014). And Jenny Edbauer Rice encourages rhetoricians to embrace the mechanics of production to engage with new modes of invention and methods of circulation (2008).

The previous scholars have focused on teaching practice, other scholars work to understand how students are using new media technologies, and they find that students may not be using new media technologies to compose for school as much as one might expect. Jessie L.

Moore et al. studied first year writing students across multiple institutions to find out how they were using composition tools. Students report using different writing tools for academic writing and for social writing. Students report using a notebook, paper, pencil, word-processing program, email, or wiki when they complete academic writing. Additionally, when students complete academic writing, "they rarely identify instructors or writing center consultants as collaborators" (8), which may indicate that they don't view their academic writing as a collaborative effort. Students report using Facebook, Twitter, and blogs when they complete social writing (7). Moore et al. conclude that students are doing more individual writing to complete academic tasks and more collaborative writing when they complete social writing tasks. Moore et al. indicate that there is a gap between the types of writing tasks students complete in academic situations and the types of writing tasks students complete in social situations. Their research suggest that students may not experience a coordinated effort from the university to integrate new media technologies in learning environments, curricula, and pedagogy.

In this thesis, I use the rhetorical concept of *techne*–as the knowledge of an art with an emphasis on knowledge of the methods of production and their effects–to argue that technical knowledge is important to building technology-rich writing cultures. First, I describe the state of instructional technologies at universities as described by the New Media Consortium and in writing programs as described by the National Council of Teachers of English. Next, I outline scholarship that introduces common humanist concerns for integrating electronic technologies into learning environments. After that, I use activity theory (Kaptelinin & Nardi 2006; Russell 1997) to argue that participant *techne* is an influential component in building a technology rich writing program culture that should be articulated in course documents. And I demonstrate an

instance of this articulation in the materials section of my ISUComm Foundations Course

Overview document.

ELECTRONIC LEARNING IN HIGHER EDUCATION AND COMPOSITION

The New Media Consortium 2017 Report

The learning associated with electronic communication the "E" in WOVE is interrelated with nationwide practices in higher education, industry, and consumer society. At the level of higher education, the New Media Consortium (NMC) and EDUCAUSE are influential in collecting and distributing information about new media technologies. The NMC was founded in 1993 by hardware manufacturers, software developers, and publishers "who realized that the ultimate success of their multimedia-capable products depended upon their widespread acceptance by the higher education community in way that had never been achieved before" (NMC History). The NMC publishes a Horizon Report that identifies important developments and applications of technologies in education. EDUCAUSE is a clearinghouse for information about technology in higher education. They publish a bi-monthly review for the IT community about current trends in technology for the higher education.

The NMC *Horizon Report: 2017 Higher Education Edition* (Adams Becker, et al.) identifies key trends, significant challenges, and important developments in technology adoption in higher education. The long-term trends that will accelerate technology adoption are advancing cultures of innovation and developing deeper learning approaches. The mid-term trends are focusing on measuring learning and redesigning learning spaces. And the short-term trends are blended learning designs and collaborative learning (8-9). The two short-term trends—blended learning designs and collaborative learning—are very relevant to writing programs and writing classrooms because they align with a pragmatic and active pedagogy that has been influential in writing programs and writing classrooms.

The NMC trend in blended learning focuses on how applications of digital modes of teaching are impacting students (9). The organization claims that "many findings showcase an increase in creative thinking, independent study, and the ability for the student to tailor learning experiences to meet their individual needs" (18). Blended learning expects instructors and students to develop digital literacies so that students become adept at navigating digital environments and engaging with online content (18). Blended learning aims to supplement existing structures with a range of educational technologies that help instructors meet the varying needs of students from different backgrounds (18). And it is particularly useful for multimodal composition programs because lets instructors and students interact and communicate using multiple modes and media.

The NMC trend in collaborative learning focuses on how the "learner [is] at the center, emphasizing interaction, working in groups, and developing solutions to real challenges" (10). Although collaborative learning is a pedagogically driven initiative, and a relatively well-established practice in writing classrooms, technology is playing a role in its adoption because "cloud-based services, apps, and other digital tools promote persistent connectivity, enabling students and educators to access and contribute to shared workspaces, anytime" (9). The report claims that collaborative learning is now commonplace and it is powerful because it recognizes the social, emotional, and learning gains associated with collaboration (20). Collaborative learning is also powerful because it generates learning experiences that will carry over into a collaborative knowledge-based workplace (20).

Although the NMC report on technology in higher education is useful and exciting for many people, there are significant challenges to applying technologies in higher education. The report identifies some of the significant challenges as in integrating technology into learning:

improving digital literacy, integrating informal and formal learning, closing the achievement gap, advancing digital equity, managing knowledge obsolescence, and rethinking the roles of educators (22-23). The first three challenges are described in more detail—improving digital literacy, integrating informal and formal learning, and closing the achievement gap.

First, for improving digital literacy, the report states that 21st century literacy practices are important for student success in the workplace and beyond. Digital literacy "transcends gaining isolated technological skills to generating a deeper understanding of the digital environment, enabling intuitive adaption to new contexts, and co-creation of content with others" (21). Digital literacy, like alphabetic literacy, is taught and learned. The responsibly for teaching digital literacy seems to be falling on the shoulders of universities. The report suggests that there is a growing expectation for universities to help students develop 'digital citizenship,' which includes learning about appropriate technology use, online communication etiquette, and digital rights (24). The report suggests that teaching digital citizenship will is:

> affecting curriculum design, professional development, and student facing services and
> resources. Due to the multitude of elements comprising digital literacy, higher education
> leaders are challenged to obtain institution-wide buy-in and to support all stakeholders in
> developing these competencies. Frameworks are helping institutions assess current staff
> capabilities, identify growth areas, and develop strategies to implement digital literacy
> practices (24).

The NMC indicates that fostering digital citizenship is a university-wide project, and writing programs may think about how they want to fit into the university-wide project. Writing programs may choose to foster digital literacy and practices of digital citizenship because so much writing is created, distributed, and consumed digitally. Digital symbolic work like

collaborative writing, choosing programs to accomplish objectives, interacting with interfaces, and managing content are rhetorical.

Second, for integrating formal and informal learning, the report states that the internet has encouraged an increased interest in self-directed, curiosity-based learning (26). Blending formal and informal learning can help create learning environments that foster experimentation, curiosity, and creativity (26). Blended learning can help students identify that formal learning is one part of their education, and from that develop the skillset to pursue self-directed lifelong learning to develop new skill sets, grow as individuals, and pursue knowledge that can help them address current social issues. Writing programs have historically taught students to use writing in their college work, their career, and as responsible citizens. Writing programs foster formal and informal learning, and therefore can incorporate new media technologies that do the same.

Third, for the achievement gap, there is a "disparity in the enrollment and academic performance between student groups, defined by socioeconomic status, race, ethnicity, or gender" (28). Technologies can help provide access to student-centered learning resources, but issues of access to technologies persist among students from low-income, minority, single-parent families, or other disadvantaged groups (28). Technology may be used to make learning more accessible, but the technology itself may need to be taught to students to help close the achievement gap. Writing programs have traditionally advocated for democratic, accessible learning for each student, so they have frameworks to help address the achievement gap in digital learning. Writing programs may proactively design digital learning experiences to help address the achievement gap.

NCTE Statements on Technology in Composition

The NMC paints a picture of a very technologized university, and argues that the technologized university is the better path for universities. The National Council of Teachers of English also identifies technology as important to student learning, but is a bit less argumentative in realizing the technologized university. The NCTE has developed two position statements entitled "NCTE Framework for 21st Century Curriculum and Assessment" and "Summary Statement: Multi-modal Literacies" both have components that address technologies as significant components of culture and education.

The "NCTE Framework for 21st Century Curriculum and Assessment" states that the "NCTE definition of 21st century literacies makes it clear that the continued evolution of curriculum, assessment, and teaching practice itself is necessary" (NCTE Framework…). The statement explains that literacies are understood to be communicative practices shared among members of a group. 21st century literacies are communicative practices shared among members of groups. 21st century literacies enable or disable students from joining groups that expect 21st century literacies as a requisite for group membership. 21st century literacies, "as in the past,[] are inextricably linked with particular histories, life possibilities, and social trajectories of individuals and groups. (NCTE Framework…). The statement continues to explain that writing programs will need to help students develop the following skills to participate in 21st-century global societies:

- "Develop proficiency and fluency with the tools of technology;"

- "Manage, analyze, and synthesize multiple streams of simultaneous information;"

- "Create, critique, analyze, and evaluate multimedia texts;" (NCTE Framework…).

The statement forefronts the social influence of literacies to describe the most important learning outcomes for students.

The NCTE statements are very supportive of incorporating technologies into the classroom, but the statements warn educators that technology use outside of the university is likely different than it is within the university. The NCTE statement on "Multimodal Literacies and Technology" suggests that "many students are frequently exposed to popular technologies, have the leisure time to experiment with their own production, develop the social connections that encourage peer teaching and learning (NCTE Multimodal…). However, programs cannot assume that all students have access and social connections to useful technologies, or that unstructured social learning of these technologies will prepare students to use them in academic or professional settings. Many students may know how to carry out tasks on a computer, but do not think critically about how they use the computer in carrying out these tasks. Specifically, educators must address the digital divide. The digital divide refers to the gap between demographics and regions that have incorporated access to modern information and communications technology and those who haven't incorporated access to it. The statement encourages institutions to find more ways to bridge the digital divide by providing access and resources to all students. More specifically, "for students [and teachers] we need to provide adequate, safe, and supported work time (Dickie Selfe). 'We must call on our institutions to provide the necessary support and infrastructural, cultural, and technological adjustments, including access to technology for people with diverse abilities and needs" (Multimodal Literacies…).

The NMC report and the NTCE statements indicate that it is important to provide electronic learning to students, but they take different approaches to describing why it is

important. The NMC focuses more on how technology can influence education, and the NCTE focuses more on how instructors need to provide students with opportunities to learn to use technologies. Both organizational approaches provide an exigency for more electronic communication in writing programs. The NMC suggests that technology can help bring about student-centered, flexible, and engaging learning. However, the NCTE suggests that the technology alone cannot bring about this shift in learning. Student-centered learning necessitates a culture change for faculty and students in which they engage with one another in new ways of teaching and learning.

Coordinating Programmatic Technology

Electronic communication technologies are an important component to teaching and learning WOVE communication, so the ways electronic communication technologies are integrated into a program are important. There is a history of individual writing instructors using innovative approaches to teaching visual rhetoric, technology, or other (at the time) fringe topics. Many times, individual instructor's innovative techniques become normal practice at their university because the teaching and learning of writing is often organized by a unit called a writing program. Charles Bazerman, as the series editor for the Writing Across the Curriculum Clearinghouse Reference Guides to Rhetoric and Composition, writes that "the teaching of writing in higher education almost always occurs within a writing program (or similar unit such as a department largely devoted to teaching of writing) under the supervision and coordination of an administrator" (in McCleod vii). A writing program typically consists of administrative components such as participants, budgets, curricula, policies, spaces, and placement procedures. A writing program uses these administrative components to coordinate coherent and consistent entrance requirements, learning activities, learning outcomes.

The writing program administrator (WPA) typically has a background in English Language or Literature, and more recently they often have training in Rhetoric & Composition or Writing Studies. WPA positions across the nation share some commonalities, but each WPA will make decisions that are specific to the needs of their program. WPAs are scholar/administrators who are in-between the academic and administrative areas of the university. One part of their job is to administer a writing program, another part of their job is to engage as a scholar in their field of specialization.

WPAs read scholarly literature about writing program administration and implement knowledge found in the literature to support the program at their institution. To support the program at their institution, they must understand the participants and procedures of the program as well as how to design and implement new support initiatives in the program. Support initiatives in the program are often designed to update classroom practice to current best practices, which means that the initiative is top-down in that the WPA is taking knowledge from the literature and recommending or requiring instructors in the local program to adopt those practices. Sometimes, the WPA can provide support for innovative practices that flourish within their own program, which means the initiative is bottom-up in that the WPA is taking local knowledge generated in the program and supporting its integration on a broader scale. A very technologically oriented program may generate bottom-up technology integration because instructors are learning and applying technologies within the program. A less technologically oriented program may experience more top-down initiatives to support practice because instructors are doing less learning and application of technologies on their own. Either way, the WPA will need to design and implement support initiatives that garner the engagement of participants in the program.

In terms of generating a culture of engagement with technology, the WPA will have many decisions to make. A first and often institutional rather than programmatic consideration is whether the program will have access to hardware in the classroom. One hardware component of a technology rich classroom is the multimedia equipment for the instructor to use. Another hardware component is the computers that students can use. It is common for programs to expect students to access a computer outside of the classroom to write and submit their writing assignments, but computers in the classroom produce integrated technology learning environments in which students can learn with an instructor how to complete more sophisticated computing tasks. A class can be held in a traditional classroom where there are no computers available for in-class activities. A class can be held in a hybrid setting where some class periods are held in traditional classrooms and other class periods are held in computer laps. A class can be held in a traditional computer labs where the computers are set up into individual workstations for each student to use. A class can also be held in a laptop classroom where there are laptops available for students and teachers to use. Access and configurations of technology will influence the way electronic learning is conducted in a program.

In addition to classroom configuration, contextual factors like the number of students who own and prefer to use their own laptop influence the methods of providing in-class hardware access. Susan Miller-Cochran and Dana Gierdowski (2013) describe their efforts to overcome the seemingly insurmountable challenges writing programs face when "fiscal challenges are paired with the ever-changing nature of writing technologies and the need to update classroom technologies on a regular basis" (50). They partnered with their campuses Information Technology and Design Services to design sustainable, flexible classrooms for pedagogically sound computer instruction settings. They had to configure their classroom within

the constraints of financial resources because they did not have enough money to buy whatever computers and furniture they desired, in scheduling because a rotating schedule of computer labs was restrictive on curriculum, and in necessity because a growing number of students were bringing their own laptops to class (51). They developed a flexible 'bring your own technology' classroom that encouraged students to bring their own technology and was pedagogically, socially, and economically successful. However, they warn that a bring your own technology design works best for campuses that require students to purchase personal technology, and they warn that campuses that don't have a technology requirement must figure out how to provide technology to students who do not bring their own technology. They suggest offering laptop check-out programs or providing a small number of program-funded laptops in each classroom for students who do not bring their own technology.

A second consideration is the software that will be provided for instructors and students to use. A program may encourage the use of no specific software in a course, relying on students and instructors to use the programs that are provided by the university or are available on the internet. A program may support the use of widely-available proprietary software or services such as Microsoft Office and Google Apps; file management systems such as Dropbox, Box, or Google Drive; and learning management systems such as Blackboard, Desire2Learn, or Canvas. A program may support the use of narrowly-focused proprietary learning services that are offered by large textbook publishers such as Macmillan. A program may support the use of in-house services based on open source project like Drupal, Moodle or WordPress that allow the program to customize the application to their own needs.

A program also may offer in-house writing systems that have been developed within the writing program. The University of Washington has every student choose a domain and learn

how to create a digital web presence for themselves and their work. Michigan State University developed Eli Review as a feedback rich peer review tool that supports their programs pedagogy. The University of Georgia developed <emma> as a content management system used in their First-year Composition Program, in other courses, and in their capstone e-Portfolio Workshop. <emma> is designed to be more than a program that addresses a task, it is designed to provide an integrated ecosystem in which students learn to write. Iowa State University hosts open-source applications ISUComm Sites and ISUComm Courses that are customized in-house to fit the program's needs.

A third consideration is integrating technology training into teacher training so that all instructors know how to use the technologies and program pedagogy to achieve adequate student learning outcomes. This component will be difficult because training for new Teaching Assistants (TA) is often conducted under very consequential time constraints—a theoretical exploration of pedagogy may not serve the immediate needs of TAs in the classroom, but a pragmatic tutorial of in-class practice may not provide the long-term pedagogical needs of the TAs in the classroom. The timing and duration of TA training will significantly influence the content and technique of the training. Programs vary in the amount of training and content they offer to instructors before they begin teaching and concurrently as they teach. Darin Payne and Theresa Enos in their chapter "TA education as Dialogic Response," discuss TA education as a dialectic response to administrative structures, the writing program curriculum, and outside forces such as industry demands for technical knowledge. The TA training program is a learning environment that responds and acts proactively toward the context as well as the goals of the program. Programs are working within their constraints and each program will need to decide

what is most important for their program to include in technology training for instructors and TAs.

A fourth consideration is how the technologies will be integrated into class activity. A learning management system may be used in the classroom to support learning during the whole semester because it supports the instructors in marking grades, attendance, and required readings. PowerPoint or Prezi, both presentation applications, may be integrated into a specific assignment. WordPress, Drupal, or hand-coded websites used as portfolios may be integrated into the end of the semester in a way that changes the structure of writing, reflection, and assessment in the course. A program will need to decide how integrated the technology is with the structure of learning in the program.

In addition to the previous four decisions, the writing program administrator will need to make many more decisions to support the needs of the institution, program, and people in it. However, these four decisions indicate a need for the writing program administrator to make important decisions about how technology will be integrated into the program. The writing program administrator may increasingly be expected to take on the responsibility of integrating and supporting electronic technologies in the program.

HUMANIST PERSPECTIVES ON "E" INTEGRATION

The "E" is a topic of scholarship in composition because electronic technologies influence the rhetorical situations, distribution systems, and time sequences for personal and workplace communication. Students who use electronic technologies are communicating in ways that are not feasible or not possible without the technology. Students interactions with electronic technologies influence their experience of access, identity, learning space, privacy, and quality of experience. These issues are all worthy of study in rhetoric and composition, especially when thinking about programmatic technology integration.

Access

Access to technologies has been a concern of the subfield of computers and writing for decades (Olson 1987; Porter 1998; Selfe 1999; Banks 2005; Grabill 2003; Goode 2010). In James Porter's (1998) *Rhetorical ethics and internetworked writing*, he writes that access is an issue for composition because access is an issue for infrastructures, literacies, and communities. Jeffrey T. Grabill (2003) cites Porter and argues that a "history of fighting for access—within universities and writing programs—exists, but we have failed to engage deeper issues of class identity, just as we have ignored the distribution of ICTs [information and communications technology] outside of writing classrooms" (457). Grabill cites Lindquist's basic definition of class as "the systemic products of a social hierarchy sustained by unequal access to resources" (Lindquist as qtd. in Grabill 457). With the basic definition of class, non-users are the outcome of a social position that does not have access to computing resources. However, with a more complex definition of performative class identity, non-users are seen to be a complex group who have varying understandings of information technology, using information, and producing value with information (463). The more complex notion of class indicates that people who do not use

ICTs benefit from joining a community that uses ICTs and learning how to use ICTs. Grabill writes that "information by itself isn't particularly useful; people need to be taught how to use information … people need to produce content for computer networks to be meaningful spaces… Productivity and activity are where the divide will increasingly exist (463). Access, therefore, does not only refer to access to computer hardware, but it refers to people's ability to access information, use information, and produce value and meaning with information. Access is an issue that universities and writing programs will need to address if they want to increase the inclusiveness of their services to all students.

This concept of access is important when organizing programmatic technology because programs wants to institute practices that support the teaching and learning of multimodal composition. Programs do not want to institute practices that frustrate or exclude students. Grabill's concept of access complicates a notion within writing studies that students should choose the software programs they write with because they will choose the program that are best for their own situation. Grabill's concept of access may prompt scholars to think about how composition programs coordinate access to computers, information, and production technologies. Grabill's access may indicate that programs should do more to coordinate the teaching and learning of computers, information, and software for their institution.

Access(ing)

Annette Powell (2007), in her article "Access(ing), habits, attitudes, and engagements: Re-thinking access as practice," further argues that access to technology should be studied as practices of accessing technologies, or an active process in which a person's technology literacy develops through practices that are reinforced, valued, and rewarded by local communities (16). Her term *access(ing)* refers to the practices of access that people develop in their local social,

political, and economic conditions. Access(ing) is a valuable theoretical contribution because it makes visible the practices that scholars can use to study, coordinate, and assess technology in a writing program. She also encourages scholar to study questions about how access(ing) continues to be less visible. How are invisible access(ing) practices produced? What forces produce practices of access(ing)? (19). Specifically, how do individual and institutional practices mediate practices of access?

Douglas M. Walls (2015), in his article "Access(ing) the Coordination of Writing Networks," presents a case study in which he uses the concept of access(ing) to describe how networked writing can negatively influence the actions of a student. He describes how the coordination of humans and non-humans (e.g. executable code, algorithms) in creating networked writing led a graduate student to leave the network because she did not like the attention that it was bringing to her and her work. Specifically, he builds on Powell's article to argue that we can study how access(ing) manifests in networks and social worlds to understand how people enact technologies for themselves from the position of their own history and perspectives. (76). As he says in his conclusion, "access to Twitter is easy. Accessing the professional networks that Twitter is a part of is hard. Accessing the parts of those professional networks that take place away from but are deeply linked to Twitter, is even more difficult (76).

Access(ing) is a concept that can help writing programs study how students access information and communication resources at the university because it is a concept that describes the practices students enact when they work together with technologies. These practices are a way of studying how students understand, use, and feel about technologies at the university. These practices will help programs design digital learning environments that are positive

experiences for students, help programs assess electronic learning, and assess whether students feel that the technologies at the university are supporting students.

Digital Identities

Scholars who study access and access(ing) often use characteristics of social identity—namely social class—to understand how people access technologies. Scholars may also use characteristics of social identity to understand digital identity. Scholars have argued that social identity influences the development of digital identity with ethnicity (Blackmon 2003), with young women (Blair et al. 2010), and with sexual orientation (Alexander et al. 2007). Digital identities have two components, the first is an identification users produce with digital platforms as they use them, and the second is a digital collection of information about users that are used for various purposes in digital environments. Users do more to shape the first component of their digital identity by learning how to use technologies, seeking out digital platforms that they want to use, and seeking out digital technologies that let them accomplish work in the world. Users may do less to shape the second component of their digital identity because websites and apps collect information and compose a digital user identity for users.

Estee N. Beck (2015) in her article "The Invisible Digital Identity: Assemblages in Digital Networks," provides a historical overview of internet tracking technologies, argues that tracking technologies create invisible digital identities, and provides a heuristic that teachers can use to teach students about their digital identities. She begins by identifying cookies and web beacons as two technologies that should be talked about when digital identities are discussed. A cookie file stays with the user and certain parts of it can be read by websites as a user navigates the web. Cookies are used by websites for various reasons including advertising, analytics, behavior, function widgets, and privacy (130). Session cookies are only stored for a browsing

session, and are useful for providing ease-of-use functions for to the user. Tracking cookies are collected over time and may be used in ways that may leverage information in ways that the user might not wish. She identifies web beacons as a problem because they allow web publishers to track information that is very in-depth like the user's housing type, age, sex, income, spending habits, hobbies, interests, items the user bought, and items the user may be interested in buying, and travel plans (129).

Beck encourages readers to see cookies as both a process as well as a reflexive language. She says, "it is not just a programmer using a tool of code to make decisions; code functions to process on its own without direct human interaction" (135). And, in a sense, it is alive because it can make things work in an autonomous fashion—"it can receive captcha and processes information, evaluate situations, make decisions, and, most significantly, act without human oversight or authorization" (Dodge as qtd. in Beck). Beck continues to explain that the liveliness of cookies might be best understood in composition using object oriented rhetoric, which gives humans and objects similar ontological status, and which may help compositionists understand how digital identity may influence digital interactions and digital compositions.

Claire Lauer (2009) in "Constructing the Self in/as Thirdspace: New Potentials for Identity Exploration in the Composition Classroom," writes about the interrelation between social identity and digital identity very differently than Beck. While Beck is concerned with the technologies that create identities for users, Lauer is concerned with the technologies that create digital spaces that let students explore new formations of their social identities. Lauer explains an assignment she gives to her students that has them enter, learn about, and contribute to a digital space which she argues helps them build a more complex understanding of themselves and their relationship with the world (70).

Beck and Lauer both contribute to composition's understanding of digital identity. Beck contributes knowledge of technical processes that are used to construct digital environments, and Lauer contributes knowledge of how engaging with a new digital space can help students explore themselves and their relationship to the space. The two articles in dialogue with one another represent the importance of studying technical innovation and human experience developing in concert with one another.

Learning Spaces

Integrating technologies into learning spaces is complicated by issues of access and identity and is influential because it changes the way students experience learning spaces. EDUCAUSE, a nonprofit association whose mission is to advance higher education using information technology, argues that "learning spaces are mission-critical for colleges and universities and represent a significant investment in space, technology, furniture, and time" (6). EDUCAUSE argues that digital technologies change how we understand the "where" and "how" of learning (2). EDUCAUSE argues that educators should begin thinking more about how technology can help revise the classroom-centric learning model to promote more active learning engagements as well as how technology can provide more informal learning environments for students to collaborate and engage with one another (2-3). Among their criteria for a learning space rating systems are the spatial characteristics of 1. enabled activities, which are "the types of interactions which are enabled among participants (in the space and outside of it) and between participants and information; and 2. Tools, technology, and furniture, which are the equipment within the space to facilitate the desired learning activities, including displays, capture systems, storage, and infrastructure (5).

Spaces are an active site of research for both higher education and the field of composition. Some individuals in composition have taken up research interests that have been grouped together as the 'spatial turn' (Dryer 2008) and some writing programs have place-based initiatives (Blakely & Pagnac 2012) which activate the campus as rhetorical space. Some groups in composition have taken up space-oriented research topics like the 2012 Computers and Writing conference that had the theme *architextures* and which explored "the ways in which architecture and architecting of spaces shape textual consumption and production" (Purdy and DeVoss). Additionally, The University of Michigan Sweetland Digital Rhetoric Collaborative recently published a collection of articles titled *Making Space: Writing Instruction, Infrastructure, and Multiliteracies*, which "situates space design and digital technologies as deliberate, infrastructural practice" (Purdy and DeVoss).

Changing learning spaces with university-sponsored and program-sponsored technologies is important to study because these technologies create an environment where certain practices make sense and others do not. Changing learning spaces should be done thoughtfully in ways that improve the university and student learning. Approaches to incorporating technologies are being written about by people in writing centers, writing programs, technical communication programs, multiliteracy centers, and multimedia centers. For example, in a writing program, if a program institutes a learning management system that students and instructors use to submit, grade, and return written work on the digital platform, then the program may also want to think about how the learning management system encourages a digital document production process, and how the digital document production process may need to be supported programmatically so that all users can access and exchange one another's work with a common writing application or file format.

Privacy

Writing in digital environments create privacy concerns because the environments have more surveillance and social capabilities than the capabilities of writing with paper and pencil. Privacy is an area of concern for scholars and users (Buchanan et al. 2007; Young & Quan-Hasse 2009). Privacy can refer to the right to be left alone, to control access to the self, or to control access to information about the self (Solove). It has formal aspects which manifest in privacy agreements and privacy settings, and informal aspects which manifest in user practices.

Kelly Quinn, in her article "An Ecological Approach to Privacy: 'Doing' Online Privacy at Midlife," conducts a workplace study on the privacy management practices of employees on social media. She examines these practices "through an ecological lens, which considers how individual's behavior intersects with the technological, social, and discursive dimensions of the social media environment" (562). She finds that there are two fundamental challenges to privacy in the Midlife organization. First, the technological characteristics of persistence and replicability challenge the user's ability to control private or personal information (568). Second, the collapsed social context and the presence of third-party sponsorship let others access content in unanticipated ways (569). She concludes that the situation" result[s] in adaptive behaviors that expose privacy management as s complex process, on that combines technological mechanisms, social strategies, and discretion in generating communicative content, to accomplish desired or acceptable levels of privacy" (569). Her study is applicable to writing programs because some instructors have explored the uses of social media platforms in the composition classroom, some learning management systems are designed for students to input personal information, and some enterprise writing systems include social functions. Writing programs will need to consider how

certain types of social software will encourage participants to use formal and informal privacy practices within the program.

Privacy is a concern for education and writing programs because it can significantly influence student engagement and behavior in the formal or informal ways similar to the ones Quinn describes. Programs do not want to create situations in which students do not want to engage in a writing activity because their participation will disclose information about themselves that they do not want to disclose. This issue is particularly salient when instructors experiment with new technologies in the classroom. Instructors may try to incorporate social media into their classrooms. If students feel that a required use of Twitter in their classroom infringes on their ability to have a Twitter account for personal uses, then they may not engage with the required use of Twitter, and they may change their engagement in that component of the course.

<div align="center">**Quality**</div>

Qualitative measures of how technology contributes positively to students' experiences in the classroom can help identify technologies that have a positive influence in the classroom. Nobles and Paganucci (2015) found that students perceived an increase in the quality of their composition when they used digital composition tools (24). Specifically, students perceived an increase in the quality of their composition when the digital tools enable targeted feedback and grammar checking (25). Additionally, students perceived an increase in the quality of their composition when they were composing for a digital environment in which a real audience may read their work. The study suggests that digital composition tools support student writing when they take advantage of perceived audiences, create opportunities for targeted feedback, and support composition mechanics.

Gulikers et al. studied composition performance between students in online authentic learning environments and students non-authentic learning environments. Authentic online learning environments provide "a context that reflects the way knowledge and skills will be used in real life" (509). An example of an authentic online learning environment would be a course site that asks students to conduct peer response with one another. Non-authentic online learning environments do not reflect the way knowledge and skills will be used in real life. An example of a non-authentic learning environment is a fictional role-based game in which the students need to complete a writing task to proceed in the game. Students felt that writing in online non-authentic composition environments were not beneficial in their learning to compose. The researchers suggest that creating these non-authentic environments does not help students learn to compose. The researchers suggest that creating an authentic composition task is a more beneficial use of technology in composition. An authentic composition task is one that may use technology as a context for the writing task, such as writing an email cover letter to an employer or creating a Power Point presentation for an in-class speech. In summary, the researchers write that digital composition networks should support authentic composition tasks in local environments.

All the humanistic concerns in this section – access, access(ing), social identity, digital identity, learning spaces, privacy, and quality— contribute to a rich understanding of electronic composition as a complex socio-technical activity that presents challenges and opportunities for the composition classroom. A programmatic effort to integrate and teach electronic communication in composition programs may be the most beneficial approach for a few reasons. First, because the writing program can help close the digital divide by providing access to computers, software, and production experiences to students. Second, because the program can coordinate and teach infrastructural composition technologies that lead to common material

writing processes at the university. Third, because there is a chance that individual instructors who integrate electronic learning into their classroom may produce a situation that is not supportive of learning. In summary, programs have an opportunity to provide thoughtful infrastructural technologies that support the teaching and learning of multimodal composition.

TECHNE AS THEORETICAL LENS FOR "E" INTEGRATION

Programs may use the classical concept of *techne* to think through the integration of electronic communication into a writing program. Techne is a Greek term that can be broadly translated as either craft or art with an emphasis on the effects of the method of production. Formal approaches to studying techne study tools apart from their implications (Clark 2010; Rice 2008). Rhetorical approaches to studying techne "emphasize not the tools themselves, but their creative design, implementation and use" (Clark 89). Scholars have studied the rhetoric of science and technology (Bazerman 1988, Latour & Woolgar 1979, Miller 1979, 1984, Spinuzzi 2013).

Scholars of the rhetoric of science and technology theorize sociotechnical or sociocultural systems to study the ways in which the rhetoric of science and technology influence societies. Sociotechnical theorists sometimes include concepts of 'object-oriented rhetoric,' which describe how objects such as writing tools, measurement tools, and computer code can act in the world in ways that influence the world. Actor-network theory (ANT) (Latour & Woolgar 1998) is a sociotechnical theory that studies the way objects are bound up in social networks. Theorists in this tradition often take a somewhat controversial stance that non-humans are actors in social networks and that all actors in the social network are material-discursive. Cultural Historical Activity Theory (CHAT) (Kapetelini & Nardi 2006, Russell 1997) is a sociocultural theory that helps frame studies of human activities as systematic and developmental. Activity theory "is equipped to study groups and organizations, and indeed its unit of analysis, the activity system, is meant to examine developmental activity of a collective that cyclically works to transform an object" (Spinuzzi 2007). Activity Theory is well-suited to study multimodal composition

programs as collective, developmental activity around the object/objective of teaching and learning multimodal communication.

David R. Russell (1997) applied the activity theory framework to writing and writing across the curriculum programs. He proposes that the broader unit of analysis–activity–helps explain the connections between writing in the composition classroom, writing in the disciplines, writing at work, and writing in social life (505). Russell makes an systematic connection between the activity systems and genre systems. Specifically, he uses Charles Bazerman's (1995) conception of genre systems to describe how genre systems mediate activity systems. He suggests that activity systems in universities give rise to textural forms called genres, which are defined by their recurrent reconstruction and use in the university. Genres mediate interactions, potentially stabilizing interactions as subjects learn to interact with a conventional genre or destabilizing interactions as subjects learn to interact with a genre in ways that have been appropriated to meet their other outcomes. Activity theory and genre theory together are a rich theoretical framework for developmental studies. The following section provides an overview of the major insights and principles of activity theory and the major insights and concepts in genre theory.

Activity Theory

Activity theory is a framework that helps define the relationship between the human mind and human action. It is a framework that is becoming known as a "cross-disciplinary framework for studying how humans purposefully transform natural and social reality, including themselves as an ongoing culturally and historically situated, materially, and socially mediated process" (Roth et al. 2012.). Victor Kapetelinin and Bonnie A. Nardi (2006) summarize the two basic insights and six principles of activity theory. The basic insights are: 1. the unity of consciousness

and 2. the social nature of the human mind. The principles are 1. object-orientedness, 2. the hierarchical structure of activity, 3. Internalization-externalization, 4. interpsychological /intrapsychological, 5. mediation, and 6. development.

The first basic insight, the unity of consciousness, grew out of the observation that the human mind is immersed in the whole context of interaction between a human being and everything else external to it world. The mind "emerges, exists, and can be understood only in the context of the subject-object relationship" (66). Minds develop as subjects act with mediational means in the world to meet objects/objectives. Each mind is produced by the subject's mediated activity to meet the objective of the group.

In multimodal composition programs, students learn to seek information sources, gather texts, use organizational tools, analyze audience, and create their own compositions. They use various compositions tools, they begin to form an understanding of multimodal compositions, and they begin to identify themselves as composers. Each student leaves the writing program with a qualitatively different understanding of multimodal composition that has been shaped through the activities using mediational means to achieve object/outcomes in the program.

The second basic insight, the social nature of mind, is the position that "culture and society are not external factors influencing the mind but rather are generative forces directly involved in the very production of mind" (39). The mind is the expression of a subject meeting object/outcomes. Subjects who work toward similar object/outcomes will develop similar structures of mind. However, subjects who work toward similar object/outcomes do not necessarily develop the same structure of mind. Leont'ev emphasized that the individual is not determined by society, rather the individual is shaped in society. He emphasized that "meanings live a 'double life' in the consciousness of the individual both as (a) meanings that objectively

exist in a culture and are generally shared by individuals who live in a culture and (b) 'personal senses' that are different for each individual" (66).

In multimodal composition programs, students participate in similar class activities and engage with similar texts, but they often have different experiences with activities or with texts. In the process of reading or viewing, students often draw on their past personal experience, social identity, or surrounding materials to gather meaning from the text. In the process of composing, students often use their experience, social identity, and surrounding materials to compose their work. A supportive multimodal composition program will impose enough uniformity in composition activities and materials for each student to reach the learning object/objectives.

The first basic principle, object-orientedness, suggests that subjects act in the direction of an object. Subjects act as builders, salespeople, or learners, and these actions are always directed toward objects in the world—a house, a car, a species of bird, or a type of document. Subjects feel emotions of sadness, happiness, and sorrow, and these emotions are directed toward something in the world—a house, a car, or a document. Objects of activities are "prospective outcomes that motivate and direct activities, around which activities are coordinated, and in which activities are crystallized in a final form when the activities are complete" (66). Objects can be understood more intuitively with the word 'objectives,' which can signify the things in the world that give meaning to what people do (66). In multimodal composition programs, program participants act toward various multimodal documents as objects. Program participants' activity is also often directed toward object/objectives like grades, social relationships, a learning management system (LMS), discussion threads, and computer software.

The second basic principle, the hierarchical structure of human activity, suggests that there are levels of psychological effort put into activity. There are three main categories of effort: activities, actions, and operations. Activities are the most cognitively demanding because they are the most dynamic, involved form of activity. Actions are moderately cognitively demanding because they are "conscious goal-directed processes that must be undertaken to fulfill the object" (67). Actions accumulate until a set of actions constitutes a full activity. Operations are the least cognitively demanding because they are the way things are carried out. Operations don't have goals of their own, they just support the goal of the action. The useful perspective of activity theory on these issues is that cognitive demands shift, for example, in learning to write with pen and paper, cognitive energy being is used in learning how to hold a pen, then cognitive energy is used in learning how to spell words, and then cognitive energy is used in learning how to write sentences. Or, cognitive effort is given to drafting in a word processor, then to giving peer feedback in an LMS feedback activity, and reflection is completed with screencast program. Cognitive tasks can build on one another so that students progressively develop the ability to think about and complete a wide variety of high-quality communication tasks.

The third basic principle, internalization-externalization, suggests that the mind internalizes the material processes that happen outside of it, and that the mind can externalize what it has previously internalized. The cognitive process of internalization is often a process of the subject taking on more of the responsibilities of an activity. It can also be understood as the activity becoming more embedded in the mental functioning of the subject. The subject will take on more of the activity, and may even begin to need fewer mediational means that were previously necessary to complete the activity. For example, a subject who is learning to type will need to look at the keyboard to learn. Eventually, they will internalize the structure of the

keyboard as well as the physical motions needed to manipulate it, and they will no longer need to look at the keyboard. In multimodal composition programs, an example that illustrates this process is the teaching process for peer response. Initially, instructors need to design and explain peer-response activities very clearly to students. After peer response is carried out multiple times, the peer responder internalizes the activity of peer response and is often able to understand the revision process, identify the assignment criteria, and offer useful feedback to a writer. The writer, after completing peer response multiple times, begins to learn to understand how their readers will typically read a text. The writer internalizes into their head the voice of the external peer responder (Cooper 1986).

Externalization is the opposite process of internalization. Externalization is when a subject's internal activities are articulated with external mediation. Externalization is important for actives such as communication because it brings the internal out in a way that can be shared in the world. Externalization is often a check for internal processes like when one documents their production process, writes out their argument in an essay, or checks their mental math with a calculator. In multimodal composition programs, composition is a form of externalization. It is a method of externalizing a subject's understanding of content and of the communication situation.

The fourth basic principle, interpsychological vs. intrapsychological, suggests that there are processes of cognition that emerge in the group and are internalized by the individual. The principle proposes that a subject first senses an activity interpsychologically as a part of the group. After the group activity is sensed interpsychologically, a subject internalizes the activity and develops an intrapsychological mental functioning appropriate to the activity. The subjects' intrapsychological mental functioning may then be externalized to reflect influence back into the

group activity. In writing programs, students are often first introduced to new activities such as audience analysis or peer response in the class group. Students complete activities and communicate about the activity together, with one goal being the intrapsychological activity of audience analysis or peer response becomes an intrapsychological function that can be carried out in the future.

The fifth basic principle, mediation, suggests that tool mediation is bound up in the subjects internal and external activities. Subjects act with tools to achieve their object/outcomes, so tools can also change how subjects act externally to achieve an object/outcome. Additionally, since external actions become internalized (principle three), subjects using tools may influence how subjects act internally to achieve an outcome. Subjects may invent a tool to achieve an outcome or they may learn to use another's tool to achieve an outcome. Subjects share tools as a form of externalized social knowledge. Subjects use of tools is functional and developmental because the tools influence how subjects achieve outcomes as well as the outcomes themselves. In multimodal composition programs, students learn how to use multimodal composition tools, and in using these tools, they internalize a composition process that is heavily influenced by the tools they use. Different tools can lead to different understandings of how to compose multimodal communications and what multimodal communications are.

The sixth basic principle, development, suggests that the process of cultural production, transmission, and re-configuration of knowledge that occurs in activity systems develops over time and in response to other activity systems. "Activity theory sees all practice as the result of certain historical developments under certain conditions. Development continuously reforms and develops practice" (71). Multimodal composition programs have developed over time, and will continue to do so. Incremental or revisionary changes to the program shape how it evolves.

The development of group activity has been visualized as a triangular relationship between subjects, tools, and outcomes (see figure 1). Yrjö Engeström has developed the activity visualization to consider many of the contextual variables in organizational applications (see figure 2). The expanded visualization is useful for applications into highly developed and regularized cultures in which there are entrenched community practices, established rules, and clear divisions of labor. A multimodal composition program can be analyzed as its own activity system. However, a multimodal composition program is part of
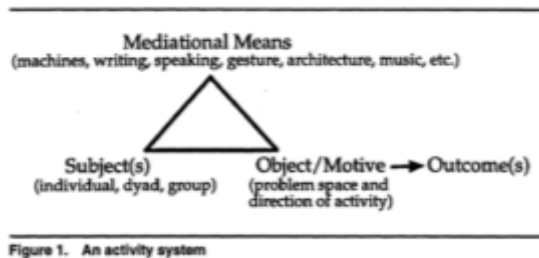

Figure 1 Activity theory triangle. From Russell (1994).
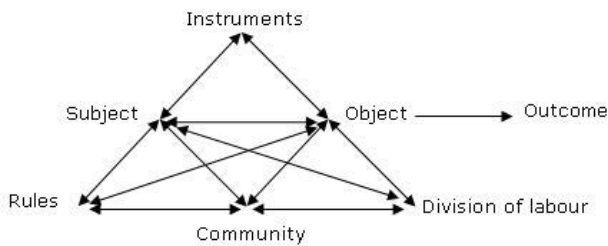
Figure 3 Activity theory triangle expanded for organizational applications. From Engeström (1987).

a university and is set in relation to other activity systems at the university. Engeström has developed the visualization more to illustrate how activity systems may interact (see figure 3). Engeström visualizes two activity systems which have a slight overlap in the object/outcomes.

Figure 2 Activity system interaction. From Engeström (1999).

These two activity systems may interact with one another in competitive or supportive activity to destroy, synthesize, or coordinate one another's activity toward their shared object/outcomes.
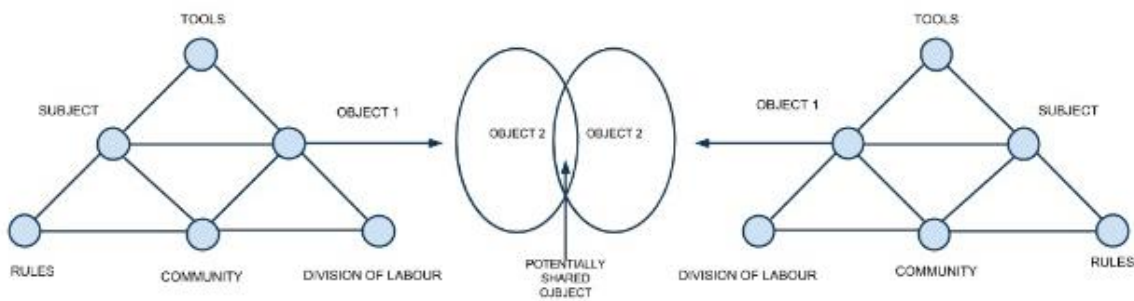
Multimodal composition programs may be activity systems that develop and sustain themselves through time. Multimodal composition programs may also interact with other activity systems at their university such as the campus information technology services (ITS) which coordinates the technologies that programs may use to teach multimodal composition and the technologies that students use to learn and work at the university. The multimodal composition program's mediational means are influenced by the technology services offered by the campus ITS department which may significantly influence the teaching and learning of multimodal composition in the program. The interaction of these two activity systems influence the composition of genres, which are textual forms that arise in activity systems (Russell 1994). Although genres are said to arise in activity systems, genres are also theorized as tools in activity systems because they are external artifacts that subjects use to achieve object/outcomes. Therefore, genres are products of activity and tools that produce activity. The North American strand of genre theory has conceptualized the functions of genres in activity systems.

Genres in Activity Systems

The North American strand of genre theory in writing studies emerged out of Carolyn R. Miller's 1984 article "Genre as Social Action." Subsequent theorists have taken up Miller's concept of genre into a genre sets (Devitt 1989), genre systems (Bazerman 1995), genre ecologies (Spinuzzi and Zachry 2000), and genre-based workplace communication studies (Spinuzzi 2013). In her article, Miller uses social cognition to argue that "a rhetorically sound definition of genre must be centered not on the substance or the form of discourse but on the action it is used to accomplish" (151). Miller's conception of genre relies on a systematic

formulation of exigence. Miller posits exigence as "a form of social knowledge—a mutual construing of objects, events, interests, and purposes that not only links them but also makes them what they are: an objectified social need" (157). Miller's conception of exigence "provides the rhetor with a socially recognizable way to make his or her intentions known" (158).

Amy Devitt (1989) advances a concept of genre set. Her concept of genre set is the range of documents that an individual must produce during their work. For example, a genre set for a classroom teacher could include the syllabus, source materials, lesson plans, attendance sheets, assignment instructions, grading rubrics, and grade reports. A genre set is the concept for genre at the level of the individual participant. Each participant will have a genre set that enables them to carry out their discursive work and which comes to represent their discursive work.

Charles Bazerman (1994) builds on this concept of genre set and advances a concept of genre system. A genre system is the collection of genre sets that are used in carrying out a group organized activity. A genre system is "a system of a complex societal machine in which genres form important levers" (79). Genres are levers that must be recognized because they are the tools we use to create meaning in highly articulated and developed systems (79). Genre systems represent the full range of genres that are leveraged by all participants in an organized group activity. Genre systems represent the full group interaction, the full event as it has been enacted by intertextual occurrences (99). For example, a genre system in the classroom is the entirety of material used in the course which include the genre sets of the instructor, students, and administrators.

Clay Spinuzzi and Mark Zachry proposed an ecological approach to studying genres. They advance a concept of genre ecologies in which genre systems are not complete, but rather genre ecologies are open system that people use how they need to when they need to. They say

that documentation "is a perpetually open-ended, dynamic, shifting, and always unfinished ecology of resources encompassing variety of media and domains" (170). Specifically, they argue that users take up documentation in an active way and supplement the documentation with tools they need to achieve their goals.

Clay Spinuzzi writes about activity theory approaches to workplace communication studies. He uses activity-based genre theory to develop methods for understanding information flow in organizations. In *Topsight* (2015), he suggests that researchers look at the micro level, which are habits and reactions of workers; the meso level, which are goal-directed actions of workers that become visible as genres; and the macro level, which are the structures of an organization that reach toward the organization's mission and vision (10). Gathering systematic information at the *micro*, *meso*, and *macro* levels will help the researcher understand how workers accomplish their work in organizations, or in large multimodal composition programs.

Genres in User Experience

While genres, genre sets, genre systems, genre ecologies, and genre research methods can help to understand how communication artifacts are used in group activity, genres work on the world and work back on their user, so the user's work and the user's identity is an important component of genre phenomena. The user's identity is especially important in situations of learning and individual development because it can influence the content they want to learn, the people they want to learn from, and the types of development they willingly pursue.

Roz Ivani (1998) argues that genres are particularly useful for studying identity in an organization because genres are "shaped by institutionally defined purposes, roles, and the social relationships associated with them, such as 'student'—subordinate to tutor, applicant— subordinate to admissions tutor…" (46). Genres shape a user's work and identities because they

position users within institutional purposes, roles, and relationships. Users are often required to produce genres to accomplish their work in an organization, and their acts of genre production work back on them in forming their identity within an organization. Users can fulfill new roles in an organization by taking up new genres to accomplish new work.

Anthony Pare writes about how users' identities change as they learn to produce genres. He says, "the move into the professional persona is an ideological transformation that occurs through participation in workplace genres" (66). Users form identities as they take up the genres because genres are "sociorhetorical habits or rituals that 'work,' that get something done, that achieve desirable ends" (60). As users produce genres, they produce the discursive work of the genres, they enact the discursive role of the person who produces the genres, and they start participating in the genre systems.

The genres that contribute to a user's identity can be stable, in transition, or in contradiction. James A. Berlin suggests that identity formation involves complementary and contradictory subject positions. He says, "we are constituted by subject formations and subject positions that do not always square with each other" (in Pare 62). Users often take on the subject formation and subject position to produce the genres of their work. Eventually, users come to identify themselves through their genres as they are enacted in their work. Users who produce a stable genre set may hold a stable identity over a long period. Users who produce an unstable genre set may develop an unstable or transitioning identity over time.

In summary, an activity system is a conceptual framework that can help identify and analyze the constituent components of multimodal composition programs. The interaction between activity systems is a conceptual framework that can help identify and analyze the overlap between multimodal composition programs and campus information technology

services. Genres in a multimodal composition programs are a way of designing learning experiences and will be influenced by the information technology services that support multimodal composition. The following section will explore the cloud computing technology that underlies many programmatic applications.

CLOUD COMPUTING METHODS OF "E" INTEGRATION

The pen, paper, and word processor were and still are common instruments in composition. In a multimodal composition program, composition tools may become a wider variety of tools such as word processors, file managers, design programs, collaborative writing apps, and web services. These composition tools are increasingly provided to users as cloud-based services. Composition programs may remediate how they integrate composition tools to understand how these new media influence the program, composition, and student learning.

Models of Cloud Computing

Sumit Goyal in *I.J. Computer Network and Information Security*, writes that "the Internet is changing from a place used to read web pages to an environment that allows the users to run software applications" (20). Internet applications decrease the processing tasks completed by an individual computer and increase the processing tasks completed by a central server or a distributed network of servers. Internet applications that centralize computing are commonly referred to as *cloud computing*. Cloud computing "is a distributed computing paradigm that focuses on providing a wide range of users with distributed access to scalable, virtualized hardware and/or software infrastructure over the internet" (20).

Cloud computing, or a *cloud*, refers to datacenter hardware and software. A cloud can be configured four ways. A public cloud is a datacenter that sells utility computing and is made available to users on a pay-as-you-go manner; a private cloud is a datacenter that is internal to an origination that only provides utility computing to that organization; a community cloud is a datacenter that provides utility computing to multiple organizations; and a hybrid cloud is comprised of at least one private datacenter and one public datacenter that are bound together by a standard technology (21-24).

Cloud computing configurations are significant in academic cultures because each configuration influences the culture of access, control, and maintenance that can form around it. Goyal says, "Computing is being transformed to a model consisting of services that are commoditized and delivered in a manner similar to traditional utilities such as water, electricity, gas, and telephon[e]" (21). Cloud computing is especially significant for educators because it is an emerging technology that enables an educational institution to provide sophisticated computational resources to students without requiring students to buy expensive computers. A private cloud service lets an organization design and implement a cloud computing infrastructure that support the organization, which is a very powerful tool, without needing to support the workstations themselves. A public or hybrid cloud also lets organizations design and implement a cloud computing infrastructure, but like any other service that is bought from a provider, the organization will be limited by the services available from the provider.

In addition to the four cloud configurations, there are three service models for cloud computing: Infrastructure-as-a-Service (IaaS), Platform-as-a-Service(PaaS), and Software-as-a-Service(SaaS). The IaaS model provides the broad capabilities to the consumer that include "provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications" (21). The IaaS model does not let the consumer control the cloud infrastructure, but it lets the consumer control the operating system, storage, applications, and possibly networking components (21). IaaS is the "pillar on which cloud computing architecture is build" (22). And IaaS is the foundation layer on which the next two layers may be built. Amazon Web Services, Windows Azure, Google Compute Engine, Rackspace Open Cloud, and IBS Smart Cloud Enterprise are all examples of IaaS service models.

The PaaS model "refers to applications created by a development language that is hosted by the cloud service provider in a cloud infrastructure" (22). PaaS provides somewhat less broad capabilities to the consumer which include creating and modifying applications, granted that they are created or modified using the programming languages or Application Programming Interfaces (API) that are provided by the cloud service provider. PaaS provides a more secure development environment to the consumer, but the consumer has fewer capabilities. Appear IQ, Mendix, Amazon Web Services, and the Google App Engine are all examples of PaaS service models.

The SaaS model refers to the software in a cloud. The consumer is buying the capability to use the provider's applications which run on the provider's cloud infrastructure. The provider makes the infrastructural, platform, and software decisions. The consumer can access applications from various client devices typically with a web browser. The consumer does not have any control over the infrastructure which includes network, servers, operating systems, storage, and possibly even application capabilities (22). Although the SaaS
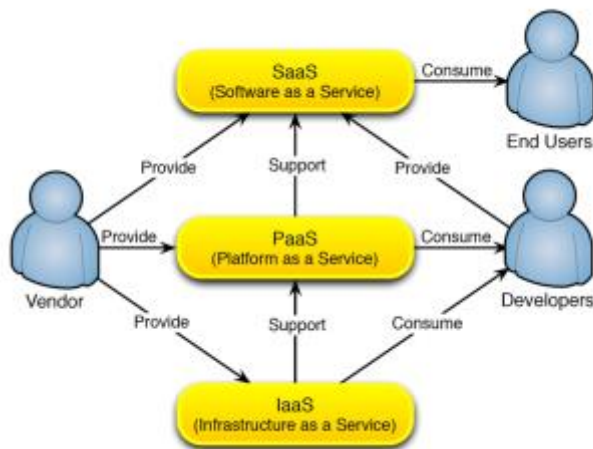
Figure 4 Models of participation in cloud computing. From Marinos and Briscoe, 2009.

model gives very little control to the consumer, but places all the work of designing and supporting the service on the provider. An example of this model is Google Docs, which is an online application that is similar to a traditional computer program, but is offered through the

internet (23). Salesforce, Oracle, SAP, Intuit, and Microsoft Office 365 are all examples of SaaS service models.

The electronic "E" in WOVE composition oftentimes refers to using software applications that are SaaS such as Microsoft Office 365, Google Apps, or Blackboard. However, as organizations, composition programs may prefer to design and host cloud services that support their organizational goals. Writing programs have developed services to support the needs of their organization. For example, Iowa State University hosts a Moodle-based platform which is designed to support the ISUComm Courses, Georgia Tech has <emma>, Michigan State has EliReview, and the University of South Florida has MyReviewers. These services enable people in the program to design and implement the system in its context of use.

Integrating the "E" in multimodal composition programs with models other than the SaaS model will require more composition programs to take an active role in developing the learning, studying, and producing of digital technologies for the university community. Given the infrastructural functions of the technologies, it may be a worthwhile work for scholars in composition programs to take up. Integrating the "E" in multimodal composition programs will take a concerted effort, however the value will be engaging more people in developing digital literacies, empowering organizers to design software to fit their needs, and supporting programs to achieve their goals.

The Constraints of Writing with Traditional Word Processors

Word processing is widespread among composition courses in the United States. Traditional word processors are programs on a single computer that typically provide a graphical user interface with which users can input and format text and images. The program produces a file that can be distributed in print or electronically. Word processors provide the user with

capabilities such as creating tables of contexts, adding hyperlinks, and creating indexes which function differently depending on how the file is distributed electronically or printed.

Traditional word processors are useful for producing individually-authored texts, but they often do not meet the demands of teaching collaborative textual behaviors such as coordinating peer-response, peer-tutoring, or instructor input. Enacting these collaborative textual behaviors with traditional word processors necessitates that the people be in the same room together with the computer and with time to create a productive understandings and discussions of the assignment, the student's work, and the methods of working through the students' problems. Simply put, traditional word processing programs do not provide many more affordances for computer-mediated collaborative writing practices than a pencil and paper, and 21st century learning may compel writing program to adopt more collaborative writing technologies.

Writing with Database-driven Word Processing and File Management

Recently, the affordances of traditional word processing programs have been expanded to incorporate database-driven functionality for word processing and file management. The affordances of SaaS cloud writing systems like Office 365, Apple Pages, or Google Docs include functionalities such as solo authoring, collaborative authoring, document backup on cloud servers, access to files in the web browser, authoring in the web browser, and file synching to personal devices. These affordances change the properties of the document in writing systems, enabling it to become an object of collaborative work, an object that is protected from loss and corrosion, and an object that is accessible from any computer terminal. Cloud writing systems are also offered by apps like Box and Dropbox, which offer database-driven file management services to users, but may also provide cloud writing services.

There are a few affordances of cloud writing systems over traditional word processing programs. First, cloud systems enable easy access to documents at multiple workstations through apps and web browsers, which helps students who may not own a computer or who work at multiple computers. Second, cloud systems enable more collaborative writing behaviors because they integrate chat functions and enable multiple people to synchronously or asynchronously edit a document. These systems may help support more accessible, collaborative writing behaviors in writing programs.

Writing with Learning Management Systems

Learning management systems are a subtype of content management systems that are designed to support educational institutions in teaching and learning activities. They provide functionalities such as assigning work, tracking assignments, making announcements, and reporting grades. Many learning management services are provided to universities as SaaS services, which means that a company will host and design the software, and the people at the university can access the software and request the company to add or modify features. Examples of SaaS learning management systems are Blackboard, Desire2Learn, and Pearson.

Some writing programs host and support their own learning management systems. Hosting and supporting their own system lets them design it to fit the needs of the organization. The ISUComm Program at Iowa State University has created ISUComm Courses, which use Moodle-based learning management systems. The ISUComm Online Learning Team works with the campus information technology services to serve and support these sites to ISUComm instructors. The sites are integrated into the ISUComm curriculum, and typically function as a syllabus for course materials, a schedule of course activities, and a place where writing activities can be carried out such as peer response, reflections, journals, and wiki writing.

<emma> is a content management system developed in-house at the University of Georgia. It is designed to support the programs progressive process-oriented pedagogy and portfolio-based assessment protocol (Balthazor and Davis). <emma> is designed to gather all writing, feedback, and discussion for a course in one space. <emma> timestamps documents to track their submission dates and to label them as drafts in the composing process. <emma> provides a tagging feature with which documents can be tagged with keywords in writing instruction. The keywords serve to standardize pedagogical terminology in the program and to produce an archive of keywords in interaction around texts. The archive is available at the end of the semester for students to use when they construct their final portfolios and write their final reflections.

The <emma> interface helps students and instructors in the program carry out the program's process pedagogy. The emphasis "is on the process of learning to write, viewing the development of writing skills as arising out of communities of practice and ongoing discussion and revision of that practice" (Balthazor and Davis Surveying the Landscape). <emma> encourages instructors to sequence writing assignment workflows with the process model by assigning pre-writing, drafts, and post-writing reflections. <emma> let the students track their progress through the process so they can conceptualize the steps in the process.

Writing with Peer-response Online Services

A more specific type of content management services are peer-response online services that help teach role-based writing behaviors of feedback and revision. These services help instructors coordinate peer-response for written documents. The services typically perform a few functions in the classroom. First, the system is database-driven, so it saves all files and work that are input into the system. The saved work supports the writing process sequence, revision, and

reflection. Second, the system assists the instructor in coordinating how other students access and respond to one another's writing. The instructor can assign peer-revision groups, provide response prompts, and rate the quality of responses. These functionalities help the instructor guide students before they respond to work and give feedback to students after they respond to work.

Eli Review is a peer-response system created at Michigan State University and supported by Drawbridge Inc. It is a database-driven service that supports instructors teaching peer response in composition classrooms. Students upload writing to the web service. Instructors distribute student writing to peer reviewers and assign peer review tasks for the students to complete. The instructor can see how the students complete the peer response tasks, support good responses, and identify any systemic student misunderstandings in the assignment or peer response process.

MyReviewers is a similar web technology created at the University of South Florida that provides role-based support for peer response. It is a web technology that is designed to help students learn to collaborate and to write well. Much like Eli Review, students upload writing to the web service. Instructors distribute writing to peer reviewers and assign review tasks. MyReviewers has many additional features for students, instructors, and administrators such as workflows that help students learn academic workflow, e-books to learn academic peer response conventions, past archives and aggregate review reports to reflect on their areas of improvement. Additionally, it incentivizes peer review with a reputational ranking system in which reviewers can earn reputations for being good reviewers.

Writing with Open-source Content Management Systems

Learning management systems are content management systems that have been designed for learning content. Some programs may choose to use a content management system to give students experience creating other types of content. Iowa State University has created the ISUComm ePortfolio platform which is based on a WordPress Network installation. The WordPress content management system is different from the learning management system because it does not by default include the functionalities that are designed for course management like functions to track attendance, gradebooks, assignments, and discussion forums. The WordPress CMS is used for the final portfolio assignment in the ISUComm Foundations Courses. It enables students to collect their communication artifacts from throughout the semester, organize an ePortfolio around these artifacts, add personal information to the introduction, add reflections to each artifact, and distribute the portfolio on the web. The ePortfolio lets students experience authoring web content using the CMS, and it helps them build understanding of the processes that go into writing for the web, designing pages, and integrating multimedia content.

Writing with a Domain

"A Domain of One's Own" is a project started at the University of Mary Washington. The project provides each student with a web domain, space on a server that can be used to create space on the web. Writers have said that the personal domain allows students to take care of their own web services, and that learning how to build and operate their own web services is a skill that students should be taught (Wired 2012). At UMW, it is now part of the first-year orientation for new students to pick a domain name, and over the first year in seminars learn to build a digital presence on the web that will help them learn at the university.

With their domain, students learn to "assemble a platform to support their publishing, their archiving, their importing and exporting, their internal and external information connections" (Wired 2012). In learning how to do these things, students engage in activities that provide rich learning moments for them to learn technical skills, compose multimodal compositions, learn information science, manage knowledge, and learn social networking. Students can take their domain with them after they graduate—either hosting on a campus server for a fee or with a hosting provider for a fee—to continue to use their personal cloud resources to compose and communicate on the web.

A Domain of One's Own is a resource-intensive learning program. The first-year program at the University of Mary Washington is comprised of teachers, librarians, and technicians who all contribute learning modules and conduct seminars for the program. However, the benefits of engaging each student in these learning activities seems to be valuable because other schools like Penn State and Emory have programs like A Domain of One's Own. And Reclaim Hosting, which is a hosting provider for the project, indicates that more than 40 schools use their hosting services for Domain of One's Own projects that their school.

ELECTRONIC TECHNOLOGIES IN COURSE OVERVIEW DOCUMENTS

Electronic technologies are an exciting area of inquiry, but integrating learning technologies into learning cultures is a complex process. One method of designing and integrating new practices into a composition program is to revise course documentation (Graban & Ryan 2005). The course documentation in a program is comprised of genres that structure the learning activity in the program. The program provides these genres to instructors to help them accomplish the work of the instructor in the program. Instructors may alter the genres to support certain activities in the classroom. Many instructors alter the genres to reflect the content knowledge that the textbook adds to the classroom. The following section describes the ISUComm Foundations program and the genres in the program used by instructors to accomplish the work of the program. It focuses on the course overview genre to show how technologies at the university may be added to the materials section to represent the composition resources that are provided to students from the overlapping activity systems of the composition program and university information technology services.

ISUComm Foundation Courses Activity System

The ISUComm Foundation Courses are a sequence of two courses organized and staffed by the English Department at Iowa State University. The courses are a first and second-year sequence of multimodal composition courses that prepare students for writing in their academic and civic lives. The two courses in the program are required of ISU students, but the number of students who take both courses varies because some may "test out" of ENGL 150 and some may even test out of ENGL 250. If students test out of one or both courses, they fulfill a 6-credit requirement by taking 300-level courses.

English 150 "Critical Thinking and Communication" is a course that applies critical reading and thinking to topics of civic and cultural importance (Curriculum and Objectives). English 250 "Written, Oral, and Electronic Composition" is a course for "analysis, composition, and reflection on written, oral, visual, and electronic (WOVE) discourse in academic, civic, and culture contexts" (Curriculum and Objectives). Both courses incorporate a portfolio or ePortfolio as a main feature of the course. As of 2017, the ePorfolio is standard practice for all instructors.

The program can provide a contemporary and comprehensive curriculum because it trains very effective teachers. When new teaching assistants (TAs) enter the program, they learn about the programs pedagogical foundations, circular design, and communication technologies. They attend an intensive one-week training in which they learn about the development of the program, how to make lesson plans, and how to use the Courses and ePortfolios. They take in a lot of information in one week, and they build up stocks of information that they will recall during their first semester. After the week of training, they enroll in a proseminar on teaching multimodal composition that lasts the duration of their first semester. The proseminar provides access to an experienced instructor, guided pedagogical readings, and a discussion group. After their first semester of teaching and proseminar, instructors are directly supervised for another semester, and then allowed to teach with less direct oversight.

Program organizers help new TAs learn multimodal pedagogy and adopt multimodal classroom practice by making the curriculum accessible, stable, and adaptable. Barbra J. Blakely and Susan B. Pagnac write that "with a significant staff of TA and non-tenure-track faculty instructing these two courses, it is important to create a curriculum that works with a standard, rhetoric, genre-based text and which can be adopted (and adapted) relatively easily by instructors" (14). The program has been well designed to afford new instructors some freedoms

to teach to their strengths and develop their areas of weaknesses, which is helpful because many new instructors may lack experience teaching multimodal communication or rhetoric.

In addition to a contemporary and comprehensive curriculum, the program integrates electronic technologies into the classrooms. The program provides ISUComm Courses, which use a Moodle-based course management system. Blakely and Pagnac write that "Moodle sites are used in our program mostly as online syllabus and announcement sites as well as handout and assignment repositories" (23). ISUComm Courses provide many functionalities to instructors, who decide the degree to which they want to incorporate Courses into their course. The program provides ePortfolios with a WordPress Network portfolio system. The ePortfolio system is now standard practice, so every new instructor learns the ePortfolio system. The course site and ePortfolio are feasible for use in the program because it has arranged for courses to be held in computer labs at least once a week. The computer lab arrangement varies from course to course. At the lower end of frequency, an instructor will have class in a computer lab for one out of three weekly meetings, and at the highest frequency, an instructor will have class in a laptop classroom every meeting.

Technologies in the Activity System Articulated in Genres

The program uses written, print, and digital media genres to organize in-class work. The largest print productions are the Instructor Guide and the Student Guide. These two genres provide the broad knowledge that instructors and students need to operate in the program. The two genres guide new instructors and students into the program, provide necessary content that structures in-class activity, and provide supplementary materials. The instructor guide provides instructors with a quick start guide as well as an explanation of the rhetoric-based program, the composition pedagogy, the 150 and 250 courses, policies and procedures, assessment as learning,
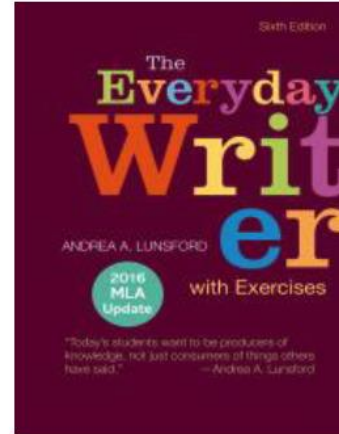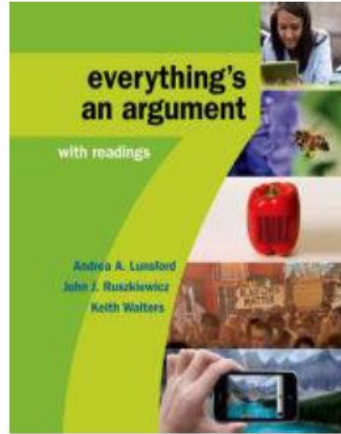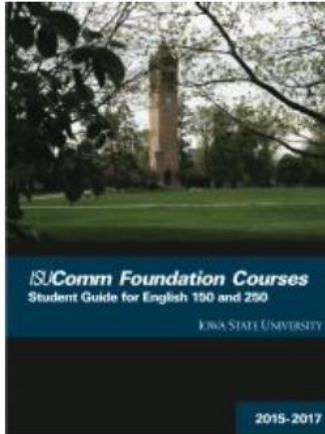
and resources. The student guide provides students with information about the 150 and 250 courses, how to ask questions, how to succeed in the courses, types of evaluation, the communication basics, the learning management system, ePortfolio, and resources.

In addition to the two guide genres, the program provides instructors with digital files of the following genres: course overview, schedule, assignment sheets, assignment rubrics, and reflections prompts. The program provides a printing budget for each instructor to print and distribute these genres in the classroom. Some instructors, especially those who teach in laptop labs, may choose to go paperless and distribute genres on their course site. The instructor typically uses the Student Guide, Course Overview, and course schedule at the beginning of the semester to establish the learning environment and requirements of the course. The instructor typically uses the ISUComm course site, assignment sheets, rubrics, and reflections throughout the semester to teach the course and guide students in meeting ISUComm objectives.

The course overview document includes an explicit discussion of technologies in three sections. The "Textbooks and Materials" section, the document as it is sent out to instructors states that a student will need "1 flash drive on which to save your English 250 work

(Default…). The "Electronic" section of the Written, Oral, Visual, and Electronic (WOVE)

objectives in the document states that the objectives are to "rhetorically analyze electronic

Figure 5 the Textbooks and Materials section of the course overview document.

communication, such as emails or website" and "create an electronic composition (e.g.,

communication portfolio)" (Default…). The "Computer Ethics and Other Electronics" section in

the document states that students are expected to use computers respectfully, only for academic

purposes, and that the student can be counted absent if they use computers in class for other

purposes (Default...).

The Student Guide contains extended discussions of the technologies used in the

program. The guide contains a complete 10-page section titled "How do I benefit from an LMS

and communication ePortfolio?" The content in the Student Guide describes learning outcomes

for the electronic mode of communication, describes of how students benefit from the Moodle

learning management system and the ePortfolio system. Additionally, it contains a list of

resources available to students at the university including access to university provided computer labs. Altogether, the Student Guide provides ample information for students to learn about how they benefit from the learning management system and ePortfolios in the course.

The assignment sheets contain fewer technical references to technology, but they do prompt students to complete assignments and reflections on how technology influences multimodal composition. The assignment sheets discuss writing processes that many students do on the computer, but they don't typically reference specific programs or techniques because each student may complete their work without a computer, with a different program, or with a different composition process. For example, the assignments sheets discuss drafting, which means the student will need to manage their drafts, but the sheets don't require or encourage students to use specific technologies to manage drafts and complete the writing process. The assignment sheet for the portfolio is a notable exception, which makes it clear that the portfolio will be a web-based project. The assignment sheet doesn't describe ePortfolios, but ePortfolios are described thoroughly in other documentation.

The assignments and rubrics used for evaluation contain very few mentions of technology. The reflections prompt students to think about their writing process. The reflections ask students to identify knowledge that they applied to the assignment, compare the assignment to other assignments, describe how they generated their thesis statement, describe how they addressed the ethical dimensions of the assignment, and reflect on the problems and solutions that arise in the writing process. The rubrics provide five categories for assessing work. The categories are context, substance, organization, style, and delivery. The categories enable a rhetorical assessment of the written work. The last category "delivery" includes formatting

guidelines for the medium including citations, margins, and visual elements like titles and headings. These two documents together do not contain technical mentions of technology.

Technologies Between the Program Activity System and ITS Activity System

ISUComm has a well-developed technology program of Courses and ePortfolios, but the documents don't incorporate explicit instruction of other university-provided technologies Microsoft Office 365, Google Apps, and Box.com. ISUComm lets students choose the programs that they want to use to complete their assignments. However, this 'hands off' strategy may not be adequate in addressing the digital divide in writing at the university and it might not be adequate in developing community writing behaviors at the university. The writing program can assist students in accessing access university provided composition services such as Microsoft Office 365, Google Apps, and Box.com that may help students engage with the technology program, coordinate cooperative work at the university, and complete their work at the university. It could also help the writing program add value to the campus because it allows the writing courses to teach how to use communication technologies to produce discourse as well as how to use discourse to learn communication technologies.

Alternatively, the program could choose to expand their current services to offer participants in the program open-source, cloud-based composition platforms such as the open source Etherpad Lite for collaborative writing, OwnCloud for file management, and OpenOffice for presentations. Offering these services to all participants would help generate a culture of use, support, and innovation with technology because the program could instruct people in how to use diverse tools in multimodal composition, gather feedback on how people like using these technologies, and design new types of electronic technologies that support teaching and learning in the program. Teaching the technologies that support accessible, collaborative writing cultures

may provide student with the material resources and shared knowledge to carry out more complex collaborative digital projects during their time at the university, it may create a community infrastructure for computer supported collaborative writing across campus, and it may change the way students understand and create documents.

<div align="center">**Course Overview Document**</div>

The Course Overview genre is important on the first days of class in setting expectations for the semester. It includes important information like course materials, course policies, course requirements, and contact information. The genre presents the traditional course materials such as the textbook, reader, and Student Guide as materials for the course, but does not currently present composition technologies as materials for the course. Composition technologies in an active learning setting may be just as important to student learning as the textbook. Additionally, some evidence suggests instructors and students are a bit timid to invest themselves in the course technologies at the beginning of the semester. Sara Doan (2015) observed that students and teachers both don't tend to customize their Moodle profiles in the ISUComm Foundations program. Doan recommends that the program create clearer expectations for the pedagogical uses of profile customization in the program, and this expectation may be extrapolated to clearer pedagogical uses of technology in the program.

Including technologies into the Course Overview Document is important to inform students of the composition technologies available to complete work in the course. Students at Iowa State University have access to Microsoft Office 365, Box.com, and Google Apps. A students' choices to use or not use these resources can significantly influence the way they understand composing with computers, how they can access their compositions, and how secure their compositions are. Students' choices to use or not use these technologies may be made

consciously, but could also be made from lack of knowledge or guidance, so the program can be improved by informing students about the resources they can use and instructing them in how to use them.

If programs want to help address the digital divide, it seems beneficial to help students learn about the university-provided composition technologies. If the program does not teach word processing and file management programs, it may have, for example, a continuation of students who compose with Microsoft Word and flash, students who compose in emails, students compose with Google Docs, and students who compose with Apple Pages and iCloud. While the program may not need to standardize student composition technologies, it should introduce students to the university-sponsored composition and communication technologies that are used at the university. The program may benefit all students by introducing the compositions technologies of the university so that students can either begin to use these technologies or at a minimum understand that the university provides technologies that are important to the work that is completed at the university and that the technologies significantly influence how people can work at the university (Grabill 2003; Powell 2007).

Comparative Document Group: Technologies in Psychology Syllabi

The presentation of course materials throughout the semester is important in how students take up the content and activities of a course. Fifty-two syllabi from the Iowa State University Department of Psychology Fall 2016 course offerings have been analyzed to compare with the course overview document. The materials section was analyzed identify how course materials are presented, and to examine the style with which course materials are presented. The practices observed in these syllabi will help inform an approach to including composition technologies into the materials section of the Course Overview Document. (see figure 5). The analysis

identifies three trends that instructors used to write the materials section of their syllabi: modularity, framing with social information, and extra attention given to a new technology.
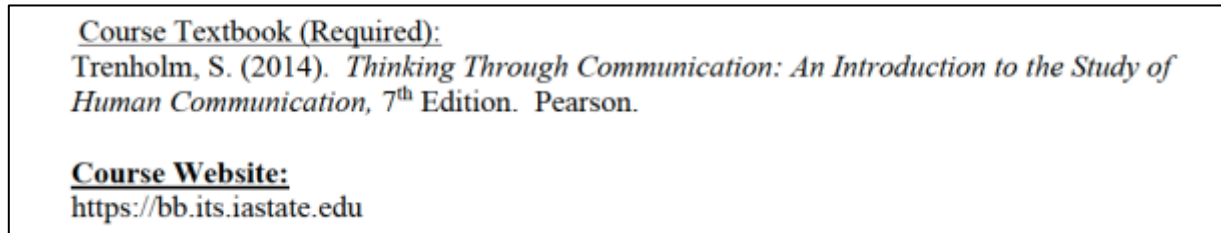
Modularity

Course Textbook (Required):
Trenholm, S. (2014). *Thinking Through Communication: An Introduction to the Study of Human Communication,* 7ᵗʰ Edition. Pearson.

Course Website:
https://bb.its.iastate.edu

Figure 6 Example of a modular materials section.

The first method of presentation in the psychology syllabi is 'modularity.' Modularity refers to the amount to which constituent components may be separated and recombined. Modularity is a term used in technical communication to refer to content that is increasingly produced in individual parts that are designed to be reused in multiple locations. In syllabi, the materials section may not purposefully be modular, but it is a property for the materials section that is significant in its relation to classroom activity. Modularity in the materials section in syllabi is not only about the amount to which a section of text could be separated or recombined in other forms. Modularity in the materials section may also correlate with the degree of control the instructor has over the activity of the course. For example, Figure 6 shows one of the most modular materials sections in all the psychology syllabi. This materials section uses two headers to simply list the citation for the textbook and the web address for the course website. This materials section does not explain how the textbook or website will be used in the course, and therefore does not set an expectation for the materials to be used in a certain way in the course. This example is textually modular and enables modularity in classroom activity.

The least modular syllabi are typically the online course syllabi that explain in detail how the course technologies are integrated in course activity. In online courses, the technology is a necessary component, so the syllabi use the technology to explain how the course will be conducted. The least modular extreme of online course syllabi are traditional classroom syllabi that describe the course technologies and the course activities together. These courses are typically highly structured in a content management

Textbook
  You might consider purchasing the textbook because not all material that will be on the exams and quizzes will necessarily have been covered in lecture (though the vast majority will have been). The specified text may be obtained very cheaply through online sources.

"Dailys": Quizzes, Activities, Participation
  Except for days on which an exam will be given, each day that class meets there will be either a short quiz based on material presented in class, an in-class activity, or a class participation check. This results in a total of 27 scores (30 total meetings minus 3 meetings for exams). Each is worth 2 points. However, only your 20 best scores will be counted. Thus, the maximum total value of these daily quizzes/activities is 40 points. You must be present in class and actually complete the quiz, activity or participation check yourself in order to receive these points. No makeups are allowed. Students who "sign for" another student will be considered guilty of academic dishonesty. In group activities, all students in a group are responsible for confirming that the total number of names signed equals the number of students who actually completed the activity in their group.

Quizzes
  All quizzes must be completed on BlackBoard. There are a total of 12 quizzes, one for each and every week of class during which there is not an exam scheduled. All quizzes are due at 5pm on Friday afternoon. However, because computer problems can sometimes prevent timely submission of quizzes through BlackBoard, a 3-day grace period will be granted for all quizzes, such that a quiz submitted by the following Monday at 5pm will still be graded as if it had been submitted by 5pm on the Friday due date (i.e., it will receive full credit). A quiz not successfully submitted by the end of the grace period on 5pm the following Monday will not be accepted and will receive a score of 0. Also note that quizzes are scored based on your <u>final</u> responses. That means if you choose the correct answer first and submit it, but later change your mind and select the incorrect answer and re-submit the quiz, you will get that answer wrong.
  Students should consult with the TA for help with the homework if they require it. Assistance on a particular homework is only provided if it is sought prior to the due date for that homework, which means the due date as listed on the syllabus (i.e., 5pm Friday). Students seeking help on homework from the TA should be prepared with very specific questions and should be prepared to show that they have studied the relevant portions of the text, lecture notes, and study guides.

Figure 7 Example of a non-modular materials section.

system, which is Blackboard in these syllabi. Figure 7 shows one of the most non-modular syllabi for a traditional in-person classroom. Figure 7 shows how the description of the course activity and classroom technologies are intermixed. The non-modularity of this syllabus makes the in-class activity least modular. For example, an instructor who did not want to give Blackboard quizzes would be in apparent contradiction of the syllabus and would confuse students. The course activity is structured in the course syllabus because of the thorough description of how the technologies will be used to structure the course.

Framing Technology with Social Information

The second method of presentation is the social information instructors use to frame the technology. The 'I' pronoun is a feature that some instructors use to show their agency within the situation. For example, one instructor writes "I will use [B]lackboard to communicate with you. Homework assignments will be posted as they are announced in class. They may be due the next class or I may ask you to complete a short activity prior to class. PowerPoint slides will be posted after class. You should check Blackboard after each class, especially if you miss a class" (Fall 2016 Syllabi).

The passive voice is a feature that some instructors use. The instructors who use the passive voice typically don't include information about who provides the class with the Blackboard site and who should be checking the Blackboard, although they imply that the students should be checking Blackboard. These instructors introduce Blackboard alongside prerequisites and required texts as a very stable component of the course. For example, one instructor writes "A Blackboard Learn site is provided for this course and should be checked regularly" (Fall 2016 Syllabi).

Procedural language is another feature that some instructors use. Instructors who use procedural language often introduce the site and then tell students how to access Blackboard. For example, one instructor writes "Students will also need to have access to this course online through the Blackboard system… If you have been officially enrolled in this class, then you should have access to this course by the end of the first week of class (or as noted by the professor. If you do not have access, then please let me know" (Fall 2016 Syllabi).

Listing the function of Blackboard in the classroom is a feature that some instructors use. Instructors who list the functions of Blackboard often introduce the site and use bullet points to list the functions. For example, one instructor writes "Blackboard will be used to post:

- Readings

- Materials such as the syllabus, handouts, and sample exam questions

- Lecture Notes

- Grades" (Fall 2016 Syllabi)

New Technology on Campus

Few instructors spend more than a few words describing the course management system. Some instructors used the course management system to describe how certain activities would be carried out (e.g., quizzes, see Figure 7). Instructors may not use many words to describe blackboard because it has been on campus for years and is ingrained in classroom practices. However, Iowa State University recently added Top Hat to their university-wide technology program, and a larger number of instr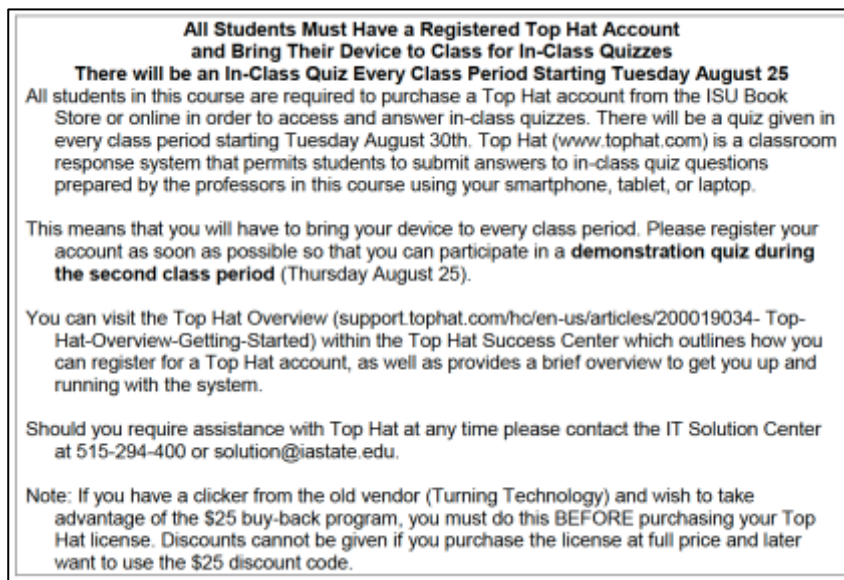uctors decided to describe Top Hat to students. For example, one instructor writes "**Top Hat Response System**: In addition to the textbook, all students must purchase and register a Top Hat account for taking in-class quizzes. See page 3 of this syllabus for instructions on purchasing and registering your Top

All Students Must Have a Registered Top Hat Account and Bring Their Device to Class for In-Class Quizzes
There will be an In-Class Quiz Every Class Period Starting Tuesday August 25
All students in this course are required to purchase a Top Hat account from the ISU Book Store or online in order to access and answer in-class quizzes. There will be a quiz given in every class period starting Tuesday August 30th. Top Hat (www.tophat.com) is a classroom response system that permits students to submit answers to in-class quiz questions prepared by the professors in this course using your smartphone, tablet, or laptop.

This means that you will have to bring your device to every class period. Please register your account as soon as possible so that you can participate in a **demonstration quiz during the second class period** (Thursday August 25).

You can visit the Top Hat Overview (support.tophat.com/hc/en-us/articles/200019034- Top-Hat-Overview-Getting-Started) within the Top Hat Success Center which outlines how you can register for a Top Hat account, as well as provides a brief overview to get you up and running with the system.

Should you require assistance with Top Hat at any time please contact the IT Solution Center at 515-294-400 or solution@iastate.edu.

Note: If you have a clicker from the old vendor (Turning Technology) and wish to take advantage of the $25 buy-back program, you must do this BEFORE purchasing your Top Hat license. Discounts cannot be given if you purchase the license at full price and later want to use the $25 discount code.

Figure 8 Example of how nan instructor give instructions to students for the new Tophat technology.

Hat account" (Fall 2016 Syllabi). On page 3, the instructor includes instructions for students to purchase, use, and seek support for Top Hat (see figure 8). The description is mostly concerned

with students knowing what the technology will be used for in class, acquiring the technology, and knowing where they can find support.

<div align="center">**Revision of the Materials Section in the Course Overview Document**</div>

The previous analysis of the psychology syllabi show instructors vary in their approach to modularity, social framing, and providing information about technologies in the syllabi. The previous analysis indicates that modularity influences how much the document structures the activity in the course, framing influences the amount of social and procedural information instructors give to students, and technologies that are new to activity systems receive much more treatment than technologies that are ingrained in activity systems.

A revision of the Course Overview Document will include university-provided technologies that provide students with a word processor and a cloud file management system and use modularity and social framing to present the technologies in a way that show how they are part of the university workflow but not by default commit students or instructors to using certain technologies. A revision could use the following wording:

Course Materials

Required Textbooks
- *ISUComm Foundation Student Guide for English 150 and 250*, Iowa State University Department of English
- Andrea Lundsford and John Ruszkiewicz. Everything's an Argument With Readings 7th edition. Boston: Bedford/St. Martin's, 2016.
- Lundsford, Andrea. The Everyday Writer, 6th edition. Boston: Bedford/St. Martin's, 2016.

Integrated Technologies
- ISUComm provides Courses at https://courses.isucomm.iastate.edu/
- ISUComm provides ePortfolios at https://eportfolios.isucomm.iastate.edu/
- ISU provides CyMail at https://cymail.iastate.edu/

Available Technologies
- ISU provides Microsoft Office 365 at https://office365.iastate.edu/
- ISU provides CyBox at http://www.iastate.box.com
- ISU provides Lynda at https://www.iastate.edu/lynda

- ISU provides Google Apps at https://cymail.iastate.edu/

The recommendation has three main features: it is modular, it communicates the provider of the technologies, and it communicates to students the technologies that will help them produce work at the university. The materials section should be modular so that it does not influence the activity in the course. It presents the provider of the technologies to prompt the students to think about what the technologies do for the class and how people access these technologies. The document presents these technologies as possibilities for staff and students to learn and use during their time in the program and at the university. Together, this section should present technologies in a way that does not force their use in the classroom, but which provides information about the technologies that the university provides to accomplish the university mission and the technologies students can use to meet the objectives of the program and accomplish their mission.

CONCLUSION

This thesis explored a humanist perspective on integrating cloud technologies into multimodal composition programs. Activity theory was used to explain the processes of the writing program. Genre theory was used to explain how genres are levers that influence the program and participants in the program. The genre of the course overview document was revised to present the cloud technologies that are available to students at the intersection of the ISUComm activity system and the ITS activity system.

A motivation for additional projects about programmatic information technology integration may involve exploring how digital technologies help students access, understand, and use information (Grabill 2003). Information technologies alter the conditions in which the students gather information, organize it, synthesize it, and employ it in communications. Composition classrooms can provide a real value to students by teaching them to access and produce information that they could not access or produce with print resources. Composition programs technologies closer to each student will help students learn the processes of digital information collection, synthesis and redistribution, and help students learn how to use information technologies to improve their composition.

Work that develops out of this thesis may focus more on the material production of multimodal programmatic cultures and writing at the university. Questions to answer may include: What types of computing resources are being used in multimodal programs? How are new instructors prepared to teach technologies in multimodal programs? Which university-sponsored information technology services are most important for students to learn in the program? How can the writing program become involved in planning and implementing

computer writing resources for students? Other work could contribute empirical data from classrooms or usability labs on how people use or learn to use these technologies.

WORKS CITED

Adams Becker, S., Cummins, M., Davis, A., Freeman, A., Hall Giesinger, C., and Ananthanarayanan, V. *New Media Consortium Horizon Report: 2017 Higher Education Edition*. The New Media Consortium, 2017.

Alexander, Jonathan, Mark McCoy, and Carlos Velez. "A real effect on the gameplay: Computer gaming, sexuality, and literacy." *Gaming lives in the twenty-first century: Literate connections*, edited by Cynthia L. Selfe, Gail E. Hawisher, and Derek Van Ittersum, Palgrave Macmillan, 2007.

Balthazor, Ron and Elizabeth Davis. "Infrastructure and Pedagogy: An Ecological Portfolio." *Kairos: A Journal of Rhetoric, Technology, and Pedagogy*, 2015.

Banks, Adam. *Race, Rhetoric, and Technology: Searching for Higher Ground*. Routledge, 2005, NCTE-Routledge Research Series.

Bazerman, Charles. *Shaping Written Knowledge: The Genre and Activity of the Experimental Article.* University of Wisconsin Press, 1988.

Bazerman, Charles. "Systems of Genres and the Enactment of Social Intentions." *Genre and the New Rhetoric*, edited by Aviva Freedman and Peter Medway, Taylor & Francis, 1995, pp. 79-101.

Beck, Estee N. "The Invisible Digital Identity: Assemblages in Digital Networks." *Computers and Composition*, 35, 2015, pp. 125-140.

Berkenkotter, Carol and Thomas N. Huckin. "Rethinking Genre From a Sociocognitive Perspective" Written Communication, 10.4, 1993, pp. 475-509.

Berlin, James. *Rhetoric and Reality: Writing Instruction in American Colleges, 1900-1985*, Southern Illinois University Press, 1987. Studies in Writing and Rhetoric.

Bizzell, Patricia. *Academic Discourse and Critical Consciousness*. University of Pittsburgh Press, 1992. Pittsburgh Series in Composition, Literacy, and Culture.

Bizzell, Patricia and Bruce Herzberg. "Isocrates." *The Rhetorical Tradition: Readings from Classical Times to the Present*. Bedford/St. Martins, 2001, pp. 67-71.

Blackmon, Samantha. "'But I'm just white' or how 'other' pedagogies can benefit all students." *Teaching writing with computers: An introduction*, edited by Pamela Takayoski and Brian Huot, 2003, pp. 42-102.

Blair, Kristine, Erin Dietel-McLaughlin & Meredith, Graupner-Hurley. "Looking into the digital mirror: Reflections on a computer camp by girls for girls." *Girl wide web 2.0: Revisiting girls , the Internet, and the negotiation of identity* edited by Sharon R. Mazerella, 2010.

Blakely, Barbara J. and Susan B. Pagnac "Pausing in the Whirlwind: A Campus Place-Based Curriculum in a Multimodal Foundation Communication Course". *Writing Program Administration*, 35.2, 2012, pp.11-37.

Bruffee, Kennith, A. "Collaborative Learning and the Conversation of Mankind". *College English*, 46.7, 1894, pp. 635-652.

Buchanan, Tom, Carina Paine, Adam N. Joinson, and Ulf-Dietrich Reips. "Development of measures of online privacy concern and protection for use on the Internet." *Journal of the Association for Information Science and Technology*, 58.2, 2007, pp. 157-165.

Bush, Vannevar. "As We May Think." *The Atlantic*, 1945.

"Curriculum and Objectives" Iowa State University Department of English, engl.iastate.edu/isucomm/foundation-2/curriculum-and-objectives-test/

Clark, Dave. "Shaped and Shaping Tools: The Rhetorical Nature of Technical Communication Technologies." *Digital Literacy for Technical Communication: 21st Century Theory and Practice*, edited by Rachel Spilka, Routledge, 2010, pp. 85-202.

Cooper, Marilyn M. "The Ecology of Writing." *College English*, 48.4, 1986, pp. 364–375.

"Default Course Overview Document" ISUComm, 2016.

Devitt, Amy J. "Intertextuality in Tax Accounting: Generic, Referential, and Functional." *Textual Dynamics of the Professions: Historical and Contemporary Studies of Writing in Professional Communities*, edited by Charles Bazerman and James Paradis. University of Wisconsin Press, 1991, pp. 336-357.

Doan, Sara C. "Digital classrooms, public profiles." *Graduate Theses and Dissertations*, 2015, paper 14343.

Dryer, Dylan. "Taking Up Space: On Genre Systems as Geographies of the Possible" *Journal of Advanced Composition*, 28.3, 2008, pp. 503-534.

Duffelmeyer, Barbara B. "Critical Work in First-Year Composition: Computers, Pedagogy, and Research." *Pedagogy*, 2.3, 2002, pp. 357-74.

Dwyer, Karen K. and Dennis A. Fus. "Communication Apprehension, Self-Efficacy and Grades in the Basic Course: Correlations and Implications." *Basic Communication Course Annual*, 11, 1999, pp. 108-32.

Eisenstein, Elizabeth L. *The printing press as an agent of change*. Cambridge University Press 1979.

Engeström, Yrjö. *Learning by expanding: An activity-theoretical approach to developmental research*. 1987.

Engeström, Y. "Expansive visibilization of work: an activity-theoretical perspective". *Computer Supported Cooperative Work*, 8, 1999, pp. 63–93.

"Fall 2016 Syllabi." Iowa State University Department of Psychology. www.psych.iastate.edu/course-informaiton/fall-2016-syllabi

Flower, Linda and John R. Hayes. "A Cognitive Process Theory of Writing." *College Composition and Communication*, 32.4, 1981, pp. 365-387.

Freire, Paulo. *Pedagogy of the Oppressed*. Penguin Books, 1996.

Goode, Joanna. "Mind the Gap: The Digital Dimension of College Access." *The Journal of Higher Education*, 81.5, 2010, pp. 583-618.

Goyal, Sumit. "Public vs. Private vs Hybrid vs Community-Cloud Computing: A Critical Review." *I.J. Computer Network and Information Security*, 3, 2014, pp. 20-29.

Graban, Tarez Samra and Kathleen J. Ryan. "From 'What Is' to 'What is Possible": Theorizing Curricular Document Revision as In(ter)vention and Reform." *Writing program administration*, 28.3, 2005, pp. 89-112.

Grabill, Jeffrey T. "On divides and interfaces: Access, class, and computers." Computers and Composition, 20, 2003, pp. 455-472.

Gulikers, Judith T., Theo J. Bastiaens, and Rob L. Martens. "The surplus value of an authentic learning environment." Computers in Human Behavior, 21, 2005, pp. 509-521.

Hendrix, Katherine G. "Peer Mentoring For Graduate Teaching Assistants: Training and Utilizing a Valuable Resource." *Basic Communication Course Annual*, 12, 2000, pp. 161-92.

Hodis, Georgeta M. and Flaviu A. Hodis. "Static and Dynamic Interplay among Communication Apprehension, Communicative Self-Efficacy, and Willingness to Communicate in the Basic Communication Course." *Basic Communication Course* Annual, 25, 2013, pp. 70-125.

Ivani, Roz. Writing and Identity. John Benjamins Publishing, 1998.

Kaptelinin, Victor and Bonnie A. Nardi. *Acting with Technology: Activity Theory and Interaction Design*, The MIT Press, 2006.

Kress, Gunther. *Multimodality: A Social Semiotic Approach to Contemporary Communication*. Routledge, 2010, pp. 114.

Kroll, Barry M. "Writing for Readers: Three Perspectives on Audience." *College Composition and Communication*, 35.2, 1984, pp. 172-185.

Latour, Bruno and Steve Woolgar. *Laboratory Life: The Construction of Scientific Facts*. Sage Publications, 1979.

Lauer, Claire. "Constructing the Self in/as Thirdspace: New Potentials for Identity Exploration in the Composition Classroom." *Composition Studies*, 37.2, 2009, pp. 53-74.

Lauer, Claire. "Contending with Terms: 'Multimodal' and 'Multimedia' in the Academic and Public Spheres." *Computers and Composition*, 26, 2009, pp. 225-239.

Lauer, Claire. Expertise with New/Multi/Modal/Visual/Digital/Media Technologies Desired: Tracing Composition's Evolving Relationship with Technology through the MLA JIL. *Computers and Composition*, 34, 2014, pp. 60-75.

LeBlanc, Karisten, Lori Vela and Marian L. Houser. "Improving the Basic Communication Course: Assessing the Core Components" *Basic Communication Course Annual*, 23, 2011, pp. 61-92.

Lunsford, Andrea. "Cognitive Development and the Basic Writer." *College English*, 41.1, 1979, pp. 38-46.

Lunsford, Andrea and Lisa Ede. *Singular Texts/Plural Authors: Perspectives on Collaborative Writing*. Southern Illinois University Press, 1990.

Marinos, Alexandros and Gerard Briscoe. "Community Cloud Computing." arXiv:0907.2485v3, 2009.

McLeod, Susan H. *Writing Program Administration*. Parlor Press and The WAC Clearinghouse, 2007, Reference Guides to Rhetoric and Composition.

Medhurst, Martin J. "The History of Public Address as an Academic Study" *The Handbook of Rhetoric and Public Address*, edited by Shawn J. Parry-Giles and J. Michael Hogan, Wiley Blackwell, 2010. 19-63.

Meyer, Kevin R. and Stephen K. Hunt. "Rethinking Evaluation Strategies for Student Participation." *Basic Communication Course* Annual, 23, 2011, pp. 96-126.

Miller, Carolyn R. "A Humanistic Rationale For Technical Writing." College English, 40.6, 1979, pp. 610-17.

Miller, Carolyn R. "Genre as Social Action." Quarterly Journal of Speech, 70, 1984, pp. 151-167.

Miller-Cochran, Susan and Dana Gierdowski. "Making Peace with the Rising Cost of Writing Technologies: Flexible Classroom Design as a Sustainable Solution." *Computers and Composition*, 30, 2013, pp. 50-60.

Moore, Jessie L, et al. "Revisualizing Composition: How First-Year Writers Use Composing Technologies." *Computers and Composition*, 39, 2016, pp. 1-13.

"Multimodal Literacies and Technology." National Council of Teachers of English, www.ncte.org/governance/MultimodalLiteracies.

Nardie, Bonnie A., and Vicki L. O'Day. *Information Ecologies: Using Technology with Heart*. The MIT Press, 1999.

"NMC History," New Media Consortium, nmc.org, 2017.

"NCTE Framework for 21st Century Curriculum and Assessment." *National Council of Teachers of English*, 2008.

Nobles, Susanne, and Laura Paganucci. "Do Digital Composition Tools Deliver? Student Perceptions of Composition Quality Using Digital Tools and Online Composition Environments." *Computers and Composition*, 38, 2015, pp. 16-31.

Olson, C. Paul. "Who Computes?" *Critical Pedagogy & Cultural Power* edited by David W. Livingsotone, 1987.

Ong, Walter J. *Orality and Literacy*. Routledge, 1982.

Park, Douglas. "The Meanings of 'Audience.'" *College English*, 44.3, 1982, pp. 247-257.

Payne, Darin and Tharesa Enos. "TA Education as Dialogic Response: Furthering the Intellectual Work of the Profession through WPA." *Preparing college teachers of writing: histories, theories, programs, practices*.

Pearson, Judy C., et al. "Competent Public Speaking: Assessing Skill Development in The Basic Course." *Basic Communication Course Annual*, 22, 2010, pp. 39-86.

Powell, Anette. "*Access(ing), habits, attitudes, and engagements: Re-thinking access as practice." Computers and Composition*, 24, 2007, pp. 16-35.

Reynolds, Dana L., et al. "Written Speech Feedback in the Basic Communication Course: Are Instructors Too Polite?" *Basic Communication Course Annual* 16, 2004, pp. 36-71.

Rice, Jenny Edbauer. "Retooling the Equipment of Writing Production." *College Composition and Communication*, 60.2, 2008, pp. 366-387.

Roth, Wolff-Michale, Luis Radford, and Lionel LaCroix. "Working With Cultural-Historical Activity Theory." *Forum: Qualitative Social Research*, 13.2, 2012.

Russell, David R. "Rethinking Genre in School and Society: An Activity Theory Analysis." *Written Communication*, 14.4, 1997, pp. 504-554.

Selfe, Cynthia L. "Technology and literacy: A story about the perils of not paying attention. College Composition and Communication, 50.3, 1999a, pp. 411-436.

Selfe, Cynthia L. *Technology and Literacy in the 21st Century: The Importance of Paying Attention*. Southern Illinois University Press, 1999b.

Shaughnessy, Mina. *Errors and Expectations: A Guide for The Teacher of Basic Writing*. Oxford University Press, 1977.

Solove, Daniel J. *Understanding privacy*. Harvard University Press, 2008.

Sommers, Nancy. "Revision Strategies of Student Writers and Experienced Adult Writers." *College Composition and Communication* 31.4, 1980, pp. 378-88.

Spear, Karen. *Sharing Writing: Peer Response Groups In English Classes*. Boynton/Cook, 1988.

Spinuzzu, Clay. *Topsight: A guide to studying, diagnosing, and fixing information flow in organizations*. Copyright Clay Spinuzzi, 2013.

Spinuzzi, Clay. "Who Killed Rex? Tracing a message through three kinds of networks." *Communicative practices in workplaces and the professions: cultural perspectives on the regulation of discourse and organizations*, edited by Mark Zachry and Charlotte Thralls, 2007, pp. 45-66.

Spinuzzi, Clay and Mark Zachry. "Genre Ecologies: An Open-System Approach to Understanding and Constructing Documentation." *ACM Journal of Computer Documentation*, 24.3, 2000, pp. 169-181.

Pare, Anthony. "Genre, and Identity: Individuals, Institutions, and Ideology." *The rhetoric and ideology of genre: strategies for stability and change*, edited by Richard M. Coe, Loreliei Lingard, and Tatiana Teslenko, 2002, pp. 57-71.

Parry, Richard. "Episteme and Techne." *The Stanford Encyclopedia of Philosophy*, edited by Edward N. Zalta, 2014.

Perl, Sondra. "Understanding Composition." College Composition and Communication, 32.4, 1980, pp. 363-369.

Porter, James. *Rhetorical Ethics and Internetworked Writing*. Greenwood Publishing Group, 1998.

Purdy, James P. and Danielle Nicole DeVoss. "Making Space to Theorize and Situate Space Making: An Introduction." *Making Space: Writing Instruction, Infrastructure, and Multiliteracies*, sweetland digital rhetoric collaborative.

Quigley, Brooke L., Katherine G. Hendrix, and Karen Freisem. "Graduate Teaching Assistant Training: Preparing Instructors to Assist ESL Students in the Introductory Public Speaking Course." *Basic Communication Course Annual*, 10, 1998, pp. 58-89.

Quinn, Kelly. "An Ecological Approach to Privacy: 'Doing' Online Privacy at Midlife." Journal of Broadcasting & Electronic Media, 58.4, 2014, pp. 562-580.

Walls, Douglas M. "Access(ing) the Coordination of Composition Networks." Computers and Composition, 38, 2015, pp. 68-78.

White, Casey Daniel, "At the boundary between speech and composition: fostering productive interdisciplinary collaboration on multimodal communication courses." *Iowa State University Graduate Theses and Dissertations*, paper 14243, 2014.

Williams, Glen. "Two Heads are Better Than One? Setting Realizable Goals in The Basic Course." *Basic Communication Course Annual*, 9, 1997, pp. 130-59.

Wired. "A Domain of One's Own." *Wired*, 2012.

Wysocki, Anne Frances. "Teaching the World Wide Web: Transforming Theory, Pedagogy, and Practice." *Teaching Writing with Computers: An Introduction*, Houghton-Mifflin, 2002, pp. 182–201.

Yancey, Kathleen Blake. Made not only in words: Composition in a new key. College Composition and Communication, 56.2, 2004, pp. 297-328.

Young, Alyson L. and Anabel Quan-Haase. "Information revelation and internet privacy concerns on social network sites: a case study of facebook." *Proceedings of the fourth international conference on Communities and technologies*, 2009, pp. 265-274.