

**Accessible Writing Spaces:  
A Framework for Inclusive Design of Virtual Composition Classrooms**

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**INTRODUCTION**

Proposing a conceptual framework for the design of virtual classrooms requires an appreciation for the tradition of inclusion within first-year college composition courses. First-year composition courses and writing centers are among the few, shared academic experiences at many institutions (Crowley, 1998). Although a student might select from several history or science courses, first-year composition uniquely connects students across the disciplines. Virtual writing spaces share this tradition and expand our ability to serve traditionally marginalized populations (Conrad & Donaldson, 2004; Maeroff, 2003; Palloff & Pratt, 2001). Striving for inclusion of students with what we describe as disabilities helps all students by recognizing and honoring differences in learning styles and communication methods. No single design or design approach for writing spaces, physical or virtual, accommodates all students with special needs. Our designs reflect myriad writing pedagogies, further complicating any suggestions for planning writing spaces. This chapter thus offers a flexible framework for evaluating the designs of virtual classrooms for online first-year composition courses, while embracing the differences of courses and instructors.

After providing an overview of the increasing need to provide students with accessible composition courses in online settings, I propose a framework for inclusive design. First, I discuss the student community historically marginalized by inaccessible physical and virtual classrooms; this discussion offers a context for the framework. I then introduce the proposed framework for inclusive design and explore current adaptive technologies and the limits of those tools. I conclude by offering design recommendations based on the framework for inclusive design and the current limitations of adaptive technologies.

Composition scholars recognize that designs of physical writing spaces affect pedagogy, as spaces constrain our teaching methods (Bissell, 2004; McGregor, 2004; Weinstein, 1979). Migrating to virtual composition classrooms potentially removes some barriers while foregrounding other barriers. Most scholarship addressing a “digital divide” focuses on issues of class (Monroe, 2004), though scholars have extended the discussion to include issues of gender, ethnicity, and culture (Gurak, 2001; Taylor, 1997). There remains, however, a need to consider divides based on disability (Seale, 2006).

College composition instructors aim to create spaces that foster inclusion and community, yet our virtual writing classrooms often present unintentional barriers for students with special needs (Seale, 2006). To help students develop multiliteracies, we often include audio, video, and interactive features in our virtual composition classrooms and writing labs (Wysocki, Johnson-Eilola, Selfe, & Sirc, 2004), media not accessible to all people. Composition class spaces should be inclusive, from the moment we outline the course content through the teaching of the course. We must move beyond “accommodating”—a term that stresses difference—and shift toward inclusive spaces.

Those of us with disabilities do not wish to be tolerated or accommodated; we seek inclusion. Unfortunately, the most common approach to addressing special needs is adapting or extending existing technologies and pedagogies (Seale, 2006). Literature offers adaptive approaches to accommodation in physical and virtual spaces (Bruch, 2003; McAlexander, 2003). The assumption is that adapting existing practices sufficiently brings the disabled into the community, but such approaches highlight difference as an obstacle, despite good intentions. Consider the use of voice recognition software by students with physical limitations. When reviewing spelling and mechanics, would we be grading the student or the software? Yet, to ignore errors potentially caused by the adaptive technology might be unfair to other students. The student with an adaptive technology accommodation remains “different” from other students, including how he or she is assessed. Sometimes, there might not be an ideal path toward inclusion, but inclusion should always be our goal.

Too often, institutions promote the presence of students with special needs as evidence of accommodation, or even inclusion (Pollak, 2009; Seale, 2006). Genuine inclusion requires

more than the presence of disabled students within a writing space, something composition instructors often recognize regardless of institutional pressures. Well-designed inclusive first-year composition virtual classrooms promote student retention and success (Higbee, 2003). However, we also have to help students understand that we cannot eliminate all barriers, even with the best of technologies (Maeroff, 2003; Pollak, 2009; Seale, 2006; C. Selfe, 1999; Taylor, 1997).

By increasing awareness of disabilities, just as we have increased awareness of other differences, we can foster a sense of responsibility and justice among our students. As the number of college students with special needs increases, we have an opportunity to be allies and advocates.

## **STUDENT COMMUNITY**

Our higher-education student populations are changing. For a variety of reasons, from better supports to better diagnostic methods (Government Accessibility Office, 2009), the percentage of post-secondary students with disabilities has risen significantly since 2000. Students with special needs account for approximately 11% of enrollment at our universities and colleges. Some states have experienced dramatic changes in student communities, for instance:

From 1999 to 2007, California public post-secondary schools reported an almost 20 percent increase in the number of undergraduate students with disabilities, and New York schools reported about a 40 percent increase in the number of undergraduate and graduate students with disabilities. (Government Accessibility Office, p. 8)

In the United States, the Americans with Disabilities Amendments Act of 2008 defines disability as any condition limiting a regular life activity. Students now entering our first-year composition courses have experienced the benefits of the Individuals with Disabilities Education Act of 2004, which mandates supports for students in our public schools. The Office of Special Education and Rehabilitative Services (OSERS) sets eligibility standards for programs and institutions receiving federal funds. Students classified as disabled during high school generally are recognized as

disabled and eligible for supports when entering college (Government Accessibility Office, 2009).

Obtaining supports for disabilities requires official documentation, presented to a college's disabilities services department; this requirement limits access to supports. McAlexander (2003) observed that "it is mainly the children of middle-class parents who are diagnosed with learning disabilities; their parents have the money and the incentive to have them tested" (p. 107), but if we design inclusive composition courses, students with special needs would receive support regardless of legal eligibility.

We have only vague federal laws and regulations to guide us towards accommodating students with disabilities at the post-secondary level. Laws are not best practices; rather they are the minimum required of us. To design truly inclusive writing spaces, we should turn towards those with the most insights: students living with various special needs. The framework for inclusive design offered later in this chapter places more weight on student experiences and our ethical obligations to them than it does on legal and regulatory compliance.

### **Physical Disabilities**

Physical assistive devices, such as wheelchairs or crutches, pose no access barriers in virtual spaces when compared to physical spaces, which may have narrow aisles or poorly designed desks. Yet there remain potential barriers in virtual composition classrooms for those with physical challenges.

The limited motor control associated with paralysis, palsy, dystrophy, and other conditions affects the ability to interact in real-time with students, instructors, and tutors via text-based chats. Typing speed and typing method might be affected by a physical impairment. Some students generate texts with adaptive input devices, such as eye-trackers, breath tubes, and finger sensors. Any exercise or discussion that emphasizes at least average typing speed will exclude some students, especially those with special needs. For example, a synchronous chat session represents a text "conversation" with a speed and pacing similar to physical in-class discussions. As Paul Jaeger and Bo Xie (2009) noted,

Features such as chat that occur in real time can be very difficult for users with a range of dis-abilities or with slower cognitive capacities. Synchronous discussions can be difficult for some types of assistive technologies, such as screen readers, to keep pace with. For individuals with cognitive impairments, keeping up with a synchronous discussion, much less participating in one, can still be quite difficult. (p. 59)

Our traditional composition classrooms exist within larger campuses, limiting our abilities to control the classroom environment. Physical spaces tend to overlap, with the sounds, smells, sights, and other stimuli from outside the writing space potentially affecting students and instructors (Pollak, 2009). Students with seizure disorders, migraine headaches, tactile sensitivity, photophobia, synesthesia, aural sensitivity, and other challenges might experience distress for reasons beyond our control.

A student with extreme sensitivity to stimuli could react to scents such as perfumes or colognes, noises in adjoining classrooms or hallways, problems with lighting, high-pitched tones from electronic devices, or any number of other stimuli beyond an instructor's control (Pollak, 2009; Wyatt, 2010). By comparison, the same student could work from his or her residence and avoid problematic stimuli. (This is not to say that institutional choices don't constrain our virtual composition classrooms; for example, the adoption of a campus-wide learning management system constrains many of our choices, as Estee Beck, Mariana Grohowski, and Kristine Blair address in chapter 1 of this volume.)

### **Cognitive Disabilities and Organizational Differences**

Cognitive challenges are among the most common disabilities eligible for supports among higher-education students (Government Accessibility Office, 2009). Studies have determined that “dyslexic students... comprise 30 to 40 percent of all students classified as disabled” in K–12 settings (Maeroff, 2003, p. 217) and approximately 10% of students receiving accommodations in postsecondary settings (Government Accessibility Office, 2009). Because dyslexia affects so many students, several research projects have sought to improve the accessibility of online spaces for these learners (Seale, 2006).

Self-discipline, organizational skills, and intrinsic motivation are essential to success in virtual spaces (Eaton, 2005; Maeroff, 2003). Online writing courses and virtual writing labs offer students flexibility, but these spaces “can backfire if students are irresponsible” (Breuch, 2005, p.146). However, some disabilities resemble “irresponsible” behavior. Cognitive disabilities include attention and executive challenges that might affect online performance (Pollak, 2009). Unfortunately, only limited research has been conducted to determine how students with some cognitive disabilities work online (Moore, Cheng, McGrath, & Powell, 2005).

### **Inclusion and Equality**

Appreciating that more students with special needs are entering our composition classrooms, our field needs to consider potential frameworks for course development that promote inclusion and equality of opportunity. Recognizing student experiences and insights can help us design more effective composition classrooms. These students deserve to be active, engaged members of the composition community.

For example, consider how we include blind students. In a physical space, we rely on speech and braille texts to deliver content. Instructors can speak while writing notes on a whiteboard, which includes not only students with visual challenges, but also helps students who are auditory learners. Online, we might offer audio recordings of lectures and text-to-speech technology. Again we will be accomplishing more than accommodating a disability because audio lectures have other advantages. Audio can be downloaded to a portable player and listened to when and where it is both conducive and convenient. All students might benefit from many of the features of podcast lectures.

Avoiding reliance on a single mode for content delivery or processing is key to inclusive design. This holds for physical and virtual writing spaces. When viewed from this perspective, inclusive design is pedagogically sound design.

### **PROPOSED FRAMEWORK FOR INCLUSIVE DESIGN**

A framework for inclusive design should extend existing theories of online education. Several frameworks for online space design exist (Bradbard & Peters, 2010; Moran, 2001); here I aim to

extend these with inclusive design. As other scholars remind us, technology should support pedagogy, not dictate it (Cook, 2005). However, we also know that the media used in a writing space inevitably shapes the content, experiences, and outcomes of writing courses and writing centers. We can extend our models with the following inclusive design framework:

1. Consider inclusion during each step of course development.
2. Incorporate technology into the writing spaces with a pedagogical rationale and an inclusive rationale.
3. Adopt constructivist pedagogies, in which students and instructors create a community of inquiry and discovery.
4. Embrace the experiences of all students, instead of ignoring or downplaying differences.
5. Guide students towards appreciating the rationale and purpose for each lesson and exercise.
6. Comply with local, state, and federal regulations.

The guiding principles for inclusive online writing spaces apply to all writing spaces. The framework suggested offers strategies for accommodating students with special needs without altering the educational goals of our writing spaces. The inclusive design framework privileges constructivist pedagogies because it stresses communities of discovery (Garrison & Vaughan, 2008). The goal is to incorporate the experiences of students actively and affirmatively into the writing space. If we find it necessary to alter writing pedagogies to accommodate any student, including those students with disabilities, we should question the validity of those pedagogies. A pedagogy that resists inclusivity may be flawed. As E. A. Draffan (2009) argued:

In a neurodiverse world, the way all learners can be supported by some of the very latest technologies can be both empowering and enabling. We must not allow the divisions between what is considered assistive and what may be fashionable to blur our vision as to how successful this applications can be in supporting study strategies. (p. 220)

**Step 1: Consider Inclusion From Concept to Completion**

Instead of adapting classes and writing centers to accommodate individuals with special needs, consider inclusion from the moment a course is conceptualized, through the design process, and during the delivery of class materials (Seale, 2006). A simple metric guides inclusive writing pedagogy: “Will this decision actively include as many students as possible?” An example consideration: If I decide to include a video or animation in course materials, how will students with visual, auditory, or other sensory challenges access the content?

Ideally, inclusive design and inclusive pedagogy address physical or cognitive challenges. Adaptations for some disabilities serve as a good starting point for considering course designs because the technologies and pedagogical rationales are well documented. For example, the American Foundation for the Blind—an organization at the forefront of usability, accessibility, and inclusive web design—actively encourages inclusion with detailed online guides (available at <http://www.afb.org/>).

**Step 2: Incorporate Technology with Strong, Sound Rationales**

Ideally, composition instructors embrace technology by choice and with defined pedagogical rationales. Unfortunately, the leading rationales for adopting online spaces in higher education, including courses and support centers, are often fiscal and competitive (Cook, 2005; Cuban, 2001; Garrison & Vaughan, 2008). Neither of these rationales should drive educational decisions, yet they do. Many institutions are rushing to follow online trends (Wahlstrom & Clemens, 2005). Kelli Carlyle Cook (2005) wrote that the desire to create online writing spaces often has little to do with pedagogy. Although the use of a virtual classroom might be forced upon a composition program or individual instructor, we still have a responsibility to apply our best pedagogical practices and ideals within these spaces. As Cook argued:

Concurrently, the availability of technology to deliver courses online and the enthusiastic marketing of this technology have encouraged administrators to migrate university instruction to the Internet. Another compelling force behind this movement is the market for online education itself—a workforce whose educational needs continue to grow. (p. 50)



### ***Adoption of Online Writing Courses***

The administrative embrace of online education and academic support represents a response to the challenging financial environment in higher education (Anson, 1999; Cook, 2005). For-profit institutions have become models of online efficiency by serving large communities with part-time instructors. Developing inclusive courses likely asks yet more of a faculty receiving minimal technical training and support.

For a public university illustration of the pressure to migrate writing instruction and supports to virtual spaces, consider the University of Minnesota and Minnesota State Colleges and Universities. Political leaders in Minnesota established a formal goal of migrating a quarter of course credits earned by undergraduate students to online settings by 2015 (Ross, 2009). The university administration believes first-year writing courses and writing lab supports are ideal candidates for virtual spaces at Minnesota campuses, as these courses do not require laboratories, studios, or other physical spaces. First-year composition classes are, from this viewpoint, among the easiest courses to migrate online and meet the new state mandates for units earned online.

Technology trends are often sudden and disruptive. Although scholars had forecast the rise of online writing instruction and virtual writing labs, few predicted the sudden shifts we have witnessed within the last five years. In 1999, the National Center for Educational Statistics predicted that 54 percent of universities and colleges would offer online courses by 2000 (Cook, 2005). Instead, we are approaching near-universal adoption of online education and supports. Designing effective and inclusive online spaces requires the investment of time, money, and human expertise. If the adoption of online spaces in higher education is driven by the desire to maintain or increase course enrollments, then the investments in designing virtual writing spaces is justified readily. The best online designs serve the broadest community of students. However, we should acknowledge that verifying virtual writing spaces comply with regulations and inclusive ideals requires testing and ongoing evaluation of designs (Seale, 2006).

### ***Pedagogical Rationales***

Virtual writing spaces enable alternative views of what constitutes a text and the teaching of composition with digital technologies (Bernhardt, 1993). Our composition pedagogies often embrace these new forms of writing. When we consider the web, ebooks, smartphone apps, and more, texts have evolved toward hyperlinked, interconnected, and interactive experiences readers shape (Bolter, 1991; Bolter & Grusin, 1999; Kalmbach, 2004; Kress, 2003; Wysocki, Johnson-Eilola, Selfe, & Sirc, 2004).

One key to online pedagogies is the ease with which we can tailor our feedback and discussions to particular classes and individual students. Writing scholars recognize that students perceive writing instructors as wielders of red pens, not as the mentors we seek to be, so we must reassure students that we are working with them (Conrad & Donaldson, 2004; Garrison & Vaughan, 2008). Because research indicates that frequency and quality of input from instructors correlates with student perception and satisfaction, virtual composition courses with active discussion forums and online chats nurture this desired connection with instructors and tutors. As Angela Eaton (2005) reported:

The two least-liked features of the online classroom are the lack of face-to-face interaction with classmates (selected by 59% of respondents) and the lack of face-to-face interaction with professors (65%). (p. 36)

Collaboration online does not erase differences, but it can mitigate differences if composition instructors mediate discussions and offer positive interactions. In asynchronous virtual composition courses, disabilities are in the background if the course is effectively planned and managed.

Writing instructors should adopt technologies that complement a pedagogical foundation and guide students toward clear learning objectives, regardless of the physical or cognitive challenges a student might have. Although we often have technologies chosen for us, we should use only those features of online classrooms that align with composition pedagogies and do not isolate students with special needs.

### **Step 3: Adopt Constructivist Pedagogies**

Inclusion embraces aspects of constructivist pedagogies, in which students and instructors create a community of inquiry (Garrison & Vaughan, 2008) and discovery. Supportive communities can form online, although scholars suggest this takes more time to establish than in physical writing spaces (Breuch, 2005). Effective first-year composition courses require a sense of community; Garrison and Vaughan (2008) suggested a model for virtual writing spaces:

A community of inquiry is a cohesive and interactive community of learners whose purpose is to critically analyze, construct, and confirm worthwhile knowledge. The three key elements for a viable community of inquiry are social presence, teaching presence, and cognitive presence. (p. 9)

Writing center scholars have long advocated for designs that encourage collaborative learning (Hobson, 2001). The small group designs so effective in physical writing spaces are easily implemented online. We can adapt these small group pedagogies to online composition courses by employing features of many learning management systems; virtual writing spaces generally support groups and pairings. Additionally, it is much easier to reassemble groups or have task-specific groups online if we wish to expose students to more of their peers during a writing course.

Inclusive design encourages asynchronous communication to accommodate students with limited motor control and cognitive differences (Bruch, 2003). Asynchronous groups have time to consider questions individually, and then bring insights and questions to the group. This approach fosters constructivist activities: the discovery, creation, and exploration of meaning (Garrison & Vaughan, 2008). The instructor becomes an online guide, not a lecturer, embracing the nature of virtual composition classrooms.

### **Step 4: Embrace Student Experiences**

Although scholars from across disciplines have anticipated a time when technology, including virtual spaces, would democratize writing instruction and support, research indicates students from different communities use equivalent technologies in significantly different ways (Taylor, 1997). Further, divisions in the physical world are recreated in virtual spaces: socio-economic,

ethnic, religious, political, and other divisions might even be exacerbated by the ease with which people can self-sort online (Lee, 2007). Virtual writing spaces should be monitored to address the self-segregation we see on campus, which likely will occur online.

To help students express their lived experiences, we need to design virtual spaces that embrace online personas. There is significant literature on the construction of online identities (Bolter, 1991; Bolter & Grusin, 1999; Kress, 2003; D. Selfe, 2004; Turkle, 1995). Some scholars suggest we adapt “icebreaker” activities to virtual writing spaces, fostering student connections (Conrad & Donaldson, 2004). We should also consider open forums—unmoderated online spaces for students to interact casually. Such conversations reinforce the sense of community necessary for productive collaboration, peer editing, and peer feedback exchanges (Garrison & Vaughan, 2008).

Creating an online persona and profile should be purposefully academic in virtual writing spaces and should allow all students an equal opportunity to express themselves, because research suggests patterns of introversion and extroversion continue in online settings (Garrison & Vaughan, 2008). The ideal profile evolves, with the student adding information across the time he or she participates in the online community.

For inclusion to be the unifying ideal underlying writing classrooms and writing centers, we must foreground the obstacles we seek to remove. Only by admitting current and historical barriers can we appreciate their power and the inertia that maintains them. One pitfall we must avoid is the tendency to pressure students to define or examine their lives primarily by disabilities or difficult circumstances they have experienced. Some advocates for the disabled refer to this as the “super cripp” persona, a mythology that celebrates overcoming a disability with an exceptional effort (Nazeer, 2006).

### **Step 5: Guide Students**

Students with disabilities rightfully question why exercises requiring skills and abilities they might not possess are required in some courses. Consider any visual composition exercise from the perspective of a blind or vision-impaired student. The valuable assignment of asking students to design websites has been explored by writing scholars (Kalmbach, 2004; Selfe,

2004). Immediately, however, a visually impaired student might feel excluded from such a task, illustrating the important role of the composition instructor as a guide. We should take such assignments as an opportunity to discuss inclusive design theories and how we need to test all media to ensure the greatest number of people receive a message. A disabled student might discover that he or she offers unique perspectives as part of a design team.

Other scholars have examined audio, video, and other multimodal forms of expression (Wysocki et al., 2004). Consider how including these activities affects students with visual, auditory, or other sensory limitations. If any aspects of an activity will exclude students, facilitate discussions on the reasons for that exclusion and what it might represent. As Garrison and Vaughan (2008) suggested:

Teaching presence in terms of design and facilitation is necessary to ensure that communities come together in a productive manner. Communities of inquiry do not automatically or quickly move to integration and application phases of inquiry unless that is the objective and a teaching presence creates and maintains cohesion. ... Familiarity developed through sustained purposeful discourse creates the cohesion necessary for participants to progress through the phases of inquiry. (p. 44)

We also need to remind students that activities such as peer review and peer editing are not the same online as in traditional settings (Breuch, 2005). We might serve as guides by introducing peer exercises to students with explanations of how collaborating online presents unique challenges.

### **Step 6: Assure Legal Compliance**

Virtual writing classes and labs occupy a unique space, academically, because the concepts and skills we teach and support, interpersonal interaction and communication, are mentioned specifically in federal legislation and regulations. According to the U.S. Government Accountability Office (GAO, 2009):

The ADA Amendments Act rejected several Supreme Court decisions which had narrowed the definition of an individual with disabilities. In addition, the ADA

Amendments Act set out guidelines for determining who qualifies as an individual with disabilities and provided a non-exhaustive list of “major life activities,” which includes learning, reading, concentrating, and thinking. (pp. 3–4)

The Americans with Disabilities Amendments Act of 2008 applies to university courses, as clarified by 1990 amendments that explicitly extended legal protections to post-secondary students. Consider the weight of this responsibility: Our virtual writing spaces, and our physical spaces, are helping individuals with disabilities that might affect the same skills considered essential for academic success. Key to fostering these skills in a virtual space is designing for effective communication. The ADA website emphasizes the following regulatory language:

III-4.3200 Effective communication. In order to provide equal access, a public accommodation is required to make available appropriate auxiliary aids and services where necessary to ensure effective communication. The type of auxiliary aid or service necessary to ensure effective communication will vary in accordance with the length and complexity of the communication involved.

While consultation is strongly encouraged, the ultimate decision as to what measures to take to ensure effective communication rests in the hands of the public accommodation, provided that the method chosen results in effective communication.

Notice that no specific accommodations are described within the ADA. The only guidelines is that we “make available appropriate auxiliary aids” in our classrooms and labs, including virtual spaces. The Higher Education Opportunity Act of 2008 added new provisions to the Higher Education Act of 1965, requiring supports for disabled students, yet it also offers no specific accommodations.

For clear technology recommendations, we must turn to Sections 504 and 508 of the Rehabilitation Act of 1973. The official Section 508 web site (<http://www.section508.gov/>) features technology guidelines issued by federal regulators. These guidelines are updated regularly as technology evolves. The Web Accessibility Initiative (WAI), a sub-committee of the

World Wide Web Consortium (W3C) also maintains a website (<http://www.w3.org/WAI/>) with guidelines similar to Section 508 (Seale, 2006).

Although writing instructors and tutors can use the legal mandates to help persuade administrators of the need for inclusive virtual spaces, the laws contain a serious weakness. If designing an inclusive space presents a “burden” to an institution, another vaguely defined standard, administration can deny instructors or students access to accommodative resources. As Adam Milani (1996) articulated,

while schools are required to provide reasonable accommodations to qualified students and bear the costs, schools are not required to provide accommodations that would fundamentally alter the nature of a program, lower or waive essential academic requirements, or result in undue financial or administrative burdens. (p. 4)

A final legal concern in writing spaces is that of privacy and disability disclosure. Under the Family Educational Rights and Privacy Act (FERPA) of 1974, the disability services office of a college or university only informs instructors of the accommodations required by a student, not the underlying disability. An instructor may not disclose any accommodations provided to a student, nor the underlying disability. Realistically, in a physical space accommodations are often obvious to other students. However, a virtual space complicates issues of disclosure. Having a clear inclusion policy posted in an online space is essential. You cannot and should not ask students to disclose any special needs to their peers. You can, however, encourage students to discuss important issues and experiences affecting their lives.

### **ADAPTIVE TECHNOLOGY**

Knowledge of legal mandates for, accommodation for, and empathy toward those with physical and neurological challenges might be insufficient to inform design choices. One way to discover if a virtual composition classroom includes all people or instead presents barriers to some individuals is to experience the space firsthand. Composition instructors responsible for designing online composition courses should visit the sites using tools that emulate the experiences of those living with challenges.

## Accessing Virtual Spaces

Text-only browsers provide one way to experience virtual settings as students with impairments do. Although intended to help individuals with visual impairments, text-only browsers also help appreciate the experiences of students with sensory processing issues. Text-to-speech programs work best when multimedia content and complex layouts are removed (Seale, 2006). An unfortunate side effect is that embedded audio content might be missing from a text-only rendering of a website.

Two text-only browsers that work well with other adaptive technologies are Lynx (<http://lynx.isc.org>) and Webbie (<http://www.webbie.org.uk>). Figure 1 below shows a view of a web page through Lynx; Figure 2 below shows a view of a web page through Webbie. Versions are available for most computing platforms and are endorsed by the World Wide Web Consortium for usability testing purposes.

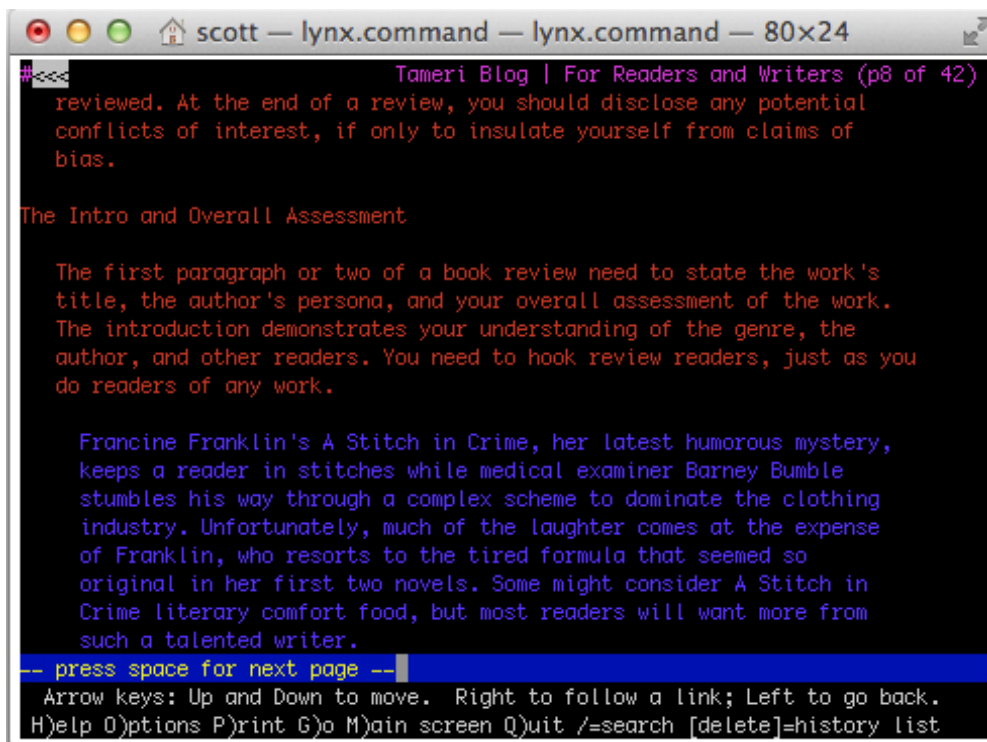


Figure 1: Lynx visiting Yahoo.com



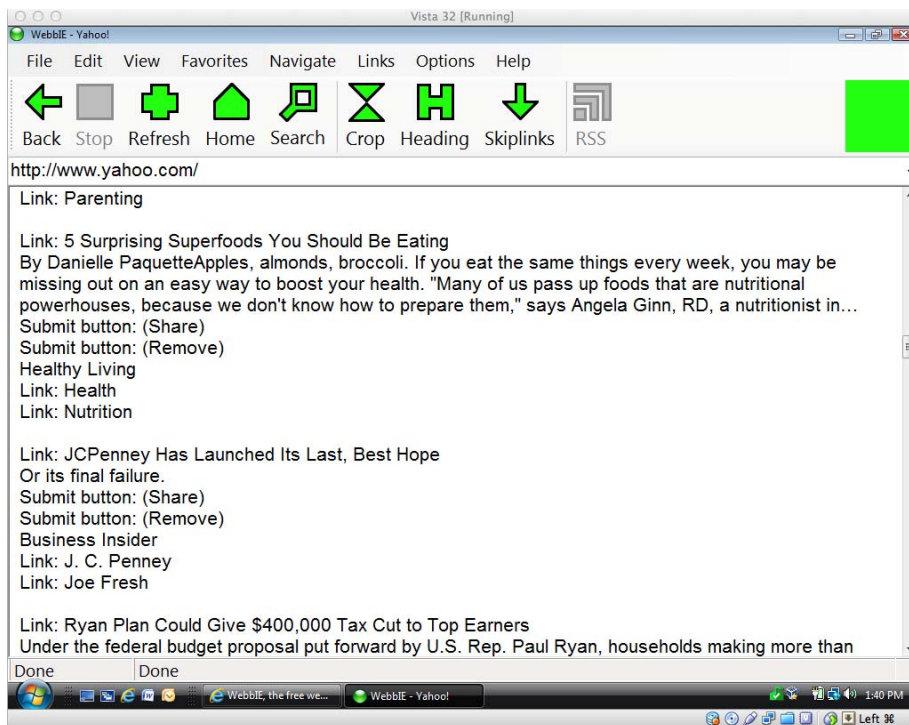


Figure 2: WebbIE visiting Yahoo.com

The Web Accessibility in Mind (WebAIM) project of Utah State University offers another tool for testing websites in text-only mode. The WAVE Accessibility Tool is a Firefox browser plug-in that includes compliance testing and a text-only browser mode (<http://wave.webaim.org/about/>). WAVE is discussed elsewhere in this chapter as a design tool. Some individuals with disabilities use WAVE within Firefox to remove or block inaccessible content. For example, individuals with seizure disorders can use WAVE to block videos and animation. Keyboard commands permit the user to control the display of multimedia content to suit their specific needs, including screen sizing, volume control, video contrast, and playback speed.

### Writing with Adaptive Technology

How a student writer gets words onto a screen or page should not matter if the final product meets expectations. Common adaptive methods for composing include voice recognition

software, braille keyboards, and alternative input devices (Seale, 2006). To comply with federal regulations, all major software vendors provide alternative input methods for individuals with disabilities. Apple, Microsoft, and other companies provide instructions on using accommodations within their applications and operating systems (see Table 1). Current versions of Microsoft and Apple operating systems include basic voice recognition software. If instructors and tutors experiment with dictation applications, they will gain an appreciation for how some students with disabilities compose.

Regulators have requested that software publishers include accommodation information online. Composition instructors should consult these resources when designing inclusive online classrooms. Learning to write documents using these accessibility features will help instructors appreciate the experiences of students with special needs.

Table 1. Resources for Adaptive Technology

| TITLE                        | URL   |
|------------------------------|---|
| Microsoft Accessibility      | <a href="http://www.microsoft.com/enable/">http://www.microsoft.com/enable/</a>         |
| Apple Accessibility          | <a href="https://www.apple.com/accessibility/">https://www.apple.com/accessibility/</a> |
| WebAIM Resources             | <a href="http://webaim.org/resources/">http://webaim.org/resources/</a>                 |
| Freedom Scientific           | <a href="http://www.freedomscientific.com/">http://www.freedomscientific.com/</a>       |
| Kurzweil Educational Systems | <a href="http://www.kurzweiledu.com/">http://www.kurzweiledu.com/</a>                   |
| Nuance Communications        | <a href="http://www.nuance.com/">http://www.nuance.com/</a>                             |

## DESIGN RECOMMENDATIONS

A gap exists between what researchers know about designing inclusive online spaces and the designs of many virtual writing spaces. Writing instructors and writing center administrators often lack direct control over the designs of the virtual spaces in which they teach (Rubens & Southard, 2005). Colleges and universities seem to prefer commercial learning management software solutions, with 60% of institutions using software from Blackboard, Inc. (Kowitz, 2009). Predesigned solutions, whether commercial or open source, often lack the flexibility a virtual writing space should embrace.

As stated earlier, trying to recreate physical writing spaces in virtual settings overlooks the differences between the two settings. Unfortunately, much of the literature on virtual spaces reflects a bias toward recreating the social cues and norms of physical interactions (Byron & Baldrige, 2007; Hawisher & Pemberton, 1997; Hawisher & Selfe, 1991; Kreijns et al. 2004; Lee, 2007; Mayer et al. 2003; Nicol, Minty, & Sinclair, 2003; Sia, Tan, & Wei, 2002; Swan, 2002; Tanis & Postmes, 2003; Tu, 2002; Walther, Loh, & Granka, 2005). Clinging to metaphors and biases from physical spaces limits our ability to craft inclusive online spaces. Research indicates “the social context of online learning is qualitatively different from face-to-face learning and that this has significant implications for online learning design” (Nicol et al., 2003 p. 270).

### Use Resources for Accessible Design

Crafting an accessible space requires knowledge of both Web standards and legal requirements. Before designing virtual writing spaces, visiting several online guides to accessible design will benefit instructors and writing center staff. One of the best resources for educators is the Web Accessibility in Mind (WebAIM) project hosted by Utah State University. Table 2 presents accessibility resources.

Table 2. Resources for Accessible Design

| TITLE                     | URL   | DESCRIPTION   |
|---------------------------|---|---|
| Web Accessibility in Mind | <a href="http://webaim.org/">http://webaim.org/</a>                           | WebAIM consolidates materials on best practices, Web standards, and compliance for accessible design.   |
| WAVE Interactive          | <a href="http://wave.webaim.org/">http://wave.webaim.org/</a>                 | WAVE Interactive allows visitors to test any public URL against Section 508 mandates and WAI standards. |
| WAVE for Firefox          | <a href="http://wave.webaim.org/toolbar/">http://wave.webaim.org/toolbar/</a> | A version of WAVE for the Firefox Web browser.  |
| Section 508 Official Site | <a href="http://www.section508.gov/">http://www.section508.gov/</a>           | The Section 508 site features current regulatory guidelines   |

|                              |   |  |
|------------------------------|---|--|
|                              |   | for accessibility. The content is updated whenever new regulatory findings are issued. |
| Web Accessibility Initiative | <a href="http://www.w3.org/WAI/">http://www.w3.org/WAI/</a>   | The World Wide Web Consortium (W3C) standards for the Web Accessibility Initiative.    |
| Creating Accessible Websites | <a href="http://www.afb.org/section.aspx?SectionID=57&amp;topicID=167">http://www.afb.org/section.aspx?SectionID=57&amp;topicID=167</a> | American Foundation for the Blind recommendations for accessibility.                   |

### **Make Text Primary**

As discussed earlier, many adaptive technologies work by analyzing the text in a virtual space. In accessible designs, all content includes textual labels; all graphics and media files should have “alt” (alternate) tags to help users navigate the spaces. Resisting the temptation to create visually appealing sites with minimal text is important. Keep layouts simple. Multi-column layouts, especially those based on tables, confuse some adaptive technologies.

### **Focus on Structure**

Inclusive designs focus on the structure of documents and spaces and then address the visual appeal of layouts (Seale, 2006). Inclusive content uses logical HTML tags, with cascading style sheets (CSS) controlling the physical layout. Unfortunately, some learning management systems abstract the underlying HTML and CSS code via graphical editors. Whenever possible, verify that headings, paragraphs, and other logical elements of a document are properly coded.

### **Recognize that Asynchronous is Flexible**

Asynchronous virtual spaces provide participants additional time and flexibility to participate via email, discussion forums, journals, blogs, wikis, and other text-based exchanges (Breuch, 2005). Being able to take extra time includes students with motor challenges and cognitive challenges. The flexibility of asynchronous settings also helps students with other physical limitations that might interrupt daily routines.

## Test the Space

Test virtual writing spaces for best practices, using tools such as WAVE and browsers like WebBIE. Accessing the online composition course with the same tools individuals with disabilities might use, before students enter the space, must be a step in inclusive course design. One of the challenges facing composition instructors is that our classrooms are not publicly accessible; they are typically protected behind passwords and other security measures. One suggestion for testing composition courses is using WAVE locally as a web browser add-on. Below is a WAVE report on a writing course offered to undergraduate statistics and economics majors at Carnegie Mellon University. Training and supports are provided to instructors to ensure compliance with regulations and best practices. As this image indicates, WAVE “detected no accessibility errors” in this online writing classroom. After passing a WAVE analysis, the course was tested with the WebBIE browser. Even when a site is designed carefully for Section 508 and WAI compliance, it is possible to overlook minor accessibility issue that could exclude students.

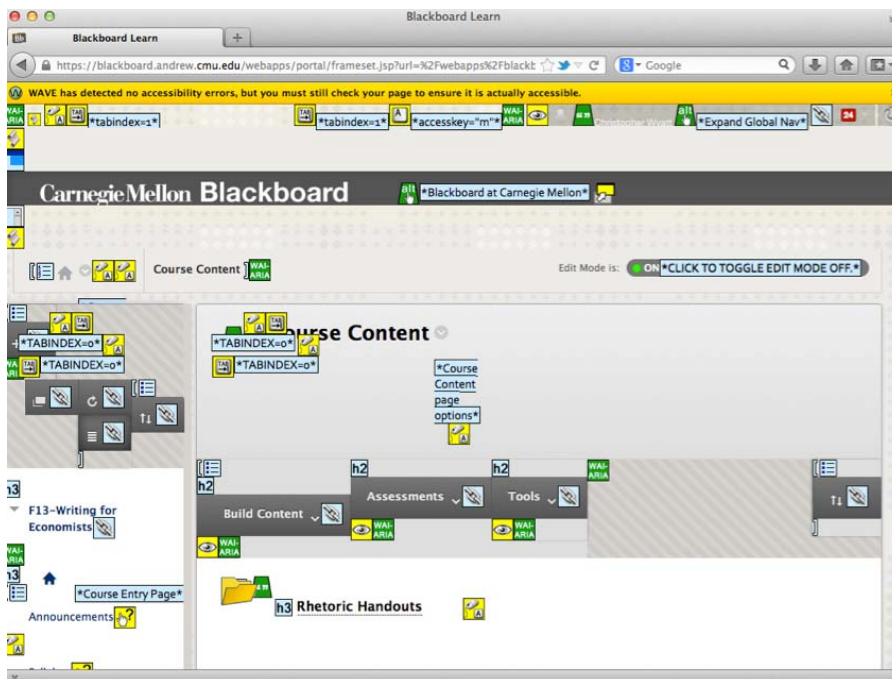


Figure 3: Sample WAVE report of Blackboard course

For comparison, an example WAVE text of Yahoo appears below.

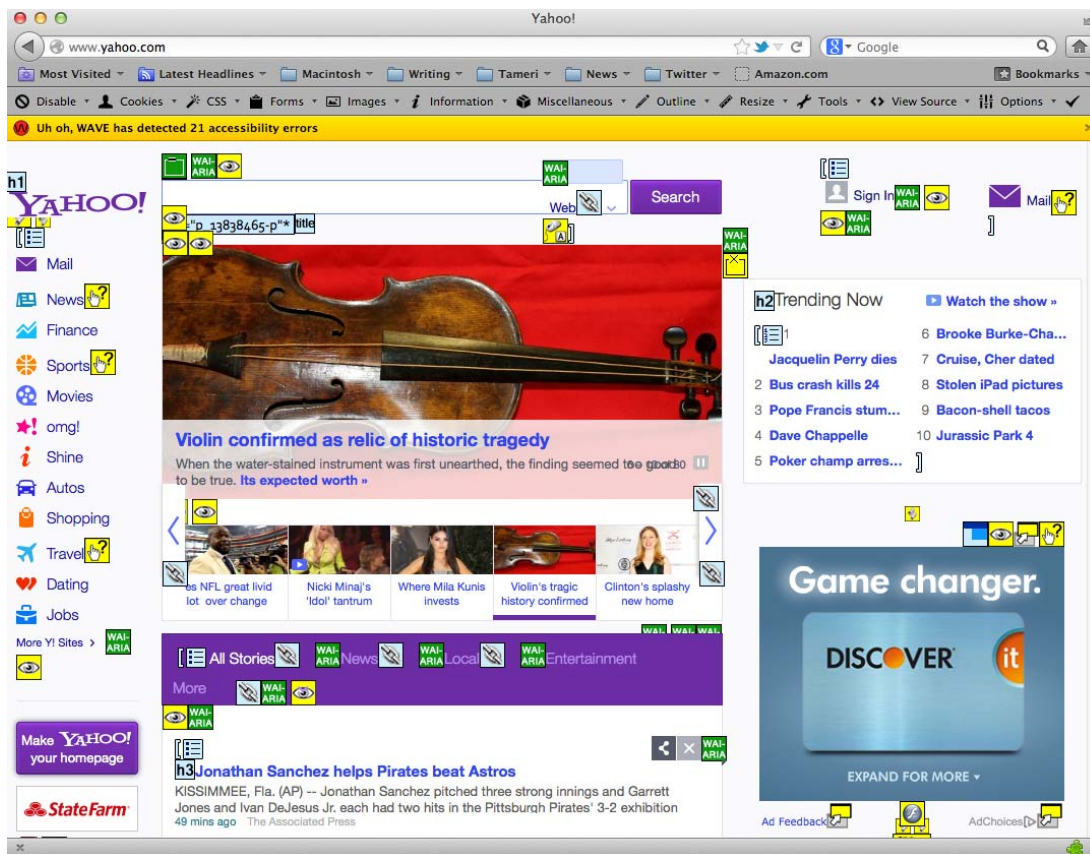


Figure 4: Sample WAVE report of Yahoo! main page

Notice that WAVE detected 21 accessibility errors on the Yahoo main page. Many major websites focus on visual appeal instead of usability. It is tempting to create similar websites for our composition courses; our students live in the multimedia-rich Internet, not the text-based interfaces of the past.

### Listen to the Community

The reality is that a virtual writing space is never finished. Students, instructors, and tutors using the site will have different experiences, ideally leading to suggestions for improvements to the design of an online composition course. Encourage members of the community to critique the virtual writing space, reflecting on what does and does not encourage thoughtful

writing, collaboration, and critical thinking. If the design is acting as a barrier, make minor adjustments when possible. Sometimes, it becomes clear that major changes to a virtual writing space are necessary. When that is the case, acknowledge that members of the community helped improve the learning environment.

## **CONCLUSION**

Our rationales for technology in physical writing spaces and the creation of virtual writing spaces should begin with the desire to educate students and provide writing support as effectively as possible. Creating an inclusive online writing space is neither easier nor more difficult than designing an inclusive physical space; the challenges are different, but the questions we must ask ourselves are similar.

Scholars have found that students sometimes assume an online course will be easier than a traditional course (Eaton, 2005; Maeroff, 2003; Rubens & Southard, 2005). Knowing this perception exists, we must ensure our writing spaces are not less rigorous or less pedagogically sound than their physical counterparts. In fact, it could be argued that we must create superior online composition classrooms.

Virtual spaces often provide convenient access to students with challenges navigating physical spaces. If online writing spaces come to be seen as primary methods of accommodation, we risk virtual spaces becoming “separate but equal” classrooms and labs for students perceived as different. We must avoid the segregation of students, however unintentional. Inclusive instructional and support spaces must improve upon traditional writing spaces.

Not only are our institutions serving a broader population of “college-aged” students, but we are also serving more non-traditional students who find virtual classrooms and supports more convenient (Eaton, 2005). To provide the ideal inclusive experience, we must attract “traditional” students to virtual writing spaces where they will gain new insights alongside non-traditional students and those from historically marginalized communities.

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