Sustaining User Engagement: Programmatic Visibility and Website Usability for Cross-Curricular Literacy Programs

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Abstract: Sustainable visibility remains a challenge for cross-curricular literacy (CCL) initiatives such as writing across the curriculum (WAC) programs. The university community must be able to access relevant information, and they need to know how to participate. CCL program websites are a commonplace way to meet these needs, but research on CCL website design is scant. Without a scholarly base, CCL professionals may be left relying on intuition in website design, or else replicating other programs' designs. In the process, they risk creating hard-to-use websites by mimicking ones designed for other programs, audiences, and contexts. Such acontextual site designs might jeopardize program visibility and sustainability. Therefore, in this article, we offer an IRB-approved user experience study of one CCL program. Via our analysis, we offer implications for CCL professionals and programs who are engaged in the process of (re)designing a website, with particular emphasis on implications for program visibility and sustainability.

Since the publication of Michelle Cox, Jeffrey R. Galin, and Dan Melzer's (2018) award-winning *Sustainable WAC: A Whole Systems Approach to Launching and Developing Writing Across the Curriculum Programs*, many scholars and administrators have taken up their framework to support emerging and established writing across the curriculum (WAC) programs. One persistently nettlesome area of sustainable WAC program development is maintaining visibility so that faculty, administrators, campus partners, and students continue to participate, even after the program ceases to be "the next big thing on campus" and instead becomes folded into the normal course of campus activity. According to Cox, Galin, and Melzer (2018), "The whole systems principle of *visibility* means that program development, assessment, and change are transparent, regular, and public" (177). In a follow-up article, Cox and Galin (2019) advise WAC professionals to achieve this kind of visibility by gathering stakeholders into an advisory committee that creates and reviews sustainability indicators, so that the "group focuses on program sustainability itself," becoming "co-owners of the program" (p. 41). Additionally, program leaders must extend visibility beyond this core group, to stakeholders across campus who are not directly involved in defining, tracking, and communicating program sustainability. As Tricia Serviss and Julia Voss (2019) put it, "[W]hile cultivating the political and financial support of upper-level administrators is essential, a successful initiative must also involve less visible institutional actors, especially those who will participate in and be affected by its programming" (459).

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This kind of broad visibility is essential not only to WAC programs, but also to all kinds cross-curricular literacy (CCL) programs—the term we will use throughout this article to refer to WAC, communication across the curriculum, writing centers, ePortfolio initiatives, National Writing Project sites, and other initiatives that support literacy learning outside of traditional departmental structures (see Tarabochia, 2017). For such programs to be sustainable, the university community must be able to find or receive relevant information on projects, services, and events, and they need to know how to participate. As it stands, however, the scholarly literature across the many types of CCL work has not systematically developed a base of knowledge about how to establish and maintain programmatic visibility.

Cox, Galin, and Melzer (2018) indicate that visibility can be achieved by circulating artifacts to various stakeholders, from annual reports to newsletters to email blasts. In a separate study, Basgier (forthcoming) found that websites are the most common artifact used to promote broad WAC program visibility. This finding likely extends to other types of CCL work because program websites are nearly ubiquitous. Still, CCL scholarship has rarely engaged in a systematic investigation of what users want and need from such websites. Joshua M. Paiz (2018) offers a theoretical justification for utilizing user experience design in the creation of online writing centers in English as a foreign language contexts, suggesting that "it is about creating an encounter between user and tool that is purposefully designed in such a way that it minimizes frustration and cognitive load while maximizing usefulness and accessibility" (6). However, Paiz does not engage in empirical investigation of in situ user experiences, relying instead on a retrospective description of Purdue's Online Writing Lab. In contrast, Stephanie Quinn and her colleagues' (2019) empirical study of accessibility in writing center website design found that most sites rarely used accessible design, which could limit stakeholder engagement and participation, especially for those with disabilities. These few publications in writing center studies suggest an opportunity for additional research into CCL website user experience. Without such a scholarly base, CCL professionals may be left relying on intuition in website design, or else replicating other programs' designs. In the process, they risk creating hard-to-use websites by mimicking ones designed for other programs, audiences, and contexts. Such acontextual site designs might then jeopardize program visibility and sustainability.

Therefore, in this article, we offer an IRB-approved user experience study of one CCL program: University Writing, a combined WAC program and writing center at a large, research-intensive university in the Southeastern United States. In what follows, we review the literature on usability and accessibility in site design and discuss user recruitment and retention. Then, we briefly describe the recent history of University Writing's website, with a focus on the impetus for the most recent redesign. After detailing our methods and findings, we conclude with key implications for CCL professionals and programs who are engaged in the process of (re)designing a website, with particular emphasis on implications for program visibility and sustainability.

Usability

We understand usability as the ability of specific user groups to achieve specific goals in specific contexts of use (Barnum, 2020; ISO, n.d.; Redish, 2010). Nielsen's (2012) groundbreaking, and oft-cited, work suggests learnability, efficiency, and memorability as desirable design goals, accompanied by as few errors as possible, with the end goal of a sense of satisfaction (Nielsen, 1994). Studies on complex healthcare sites, such as those conducted by Saad et al. (2022), show that sites designed with usability in mind are ultimately more helpful to their intended users, no matter the users' level of expertise with the content. This research can also be applied to our work on CCL websites, as these programs regularly attract a diverse range of stakeholders with different contexts and objectives, much like the audience of a healthcare site (Bastien, 2010; Salem, 2016).

Different elements of website design can influence user experience (UX), which can be defined as a user's responses and perceptions before, during, and after the use of a website (ISO, n.d.; Schmidt et al., 2009). One element that contributes to UX is visual design, or the aesthetic and visual qualities of a website (Demangeot & Broderick, 2010). Website visual design involves specific attributes such as typography, color, contrast, content quality, navigation, and layout (Jongmans et al., 2022; Schmidt et al., 2009). An attractive visual design has a positive effect on a website's overall UX, as users are more likely to perceive the website as usable and experience pleasure when using the site (Jongmans et al., 2022). In addition to the level of attractiveness, attributes such as font and color choice can influence the level of trust a user has with a website—an important factor to consider when a website is visited by users of different cultures and backgrounds (Faisal et al., 2017). All these factors—attractive visual design, tailored design elements, and trust—help retain user satisfaction and loyalty towards a website (Faisal et al., 2017). By extension, such effects may also enhance CCL stakeholder engagement and investment in programmatic success and sustainability.

CCL professionals typically want those stakeholders to participate in programs and access resources, including web resources, regularly. Indeed, a major goal of usable website design is user retention, which is an essential factor for any information-based website (Hall & Hanna, 2004). In addition to helping users achieve their informational goals efficiently and effectively, usable website design can encourage users to revisit a site for their future needs (Faisal et al., 2017). However, if a user experiences frustration with elements of a website, they will likely not return as they feel the site cannot provide their desired goals and outcomes (Ceaparu et al., 2004; Garrett et al., 2004; Norman, 1999). To reduce user frustrations, researchers can conduct usability testing with actual users of the site and improve the site's overall user experience (Denton et al., 2016). Websites that perform usability testing result in stronger user satisfaction and intention of use, resulting in a more usable site that is more likely to see returning users (Venkatesh et al., 2014).

Usability testing is often based on Nielsen's usability characteristics, which, as previously mentioned, are often shorthanded as learnability, efficiency, memorability, errors (making, preventing, and recovering from), and satisfaction. Additional characteristics include recognition rather than recall, user control and freedom, system status visibility, efficiency of use, help and documentation, error detection and recovery, consistency, system-reality matching, and an aesthetic and minimalist design (Nielsen, 1994; Nielsen, 2012). Drawing on these characteristics, we wanted to find out:

- How easily users accomplished tasks the first time they encountered a site design (learnability);
- How quickly users performed tasks (efficiency);
- If users could maintain proficiency upon returning to a site after an absence (memorability);
- How many errors users made, the severity of those errors, and their ability to recover from those errors (errors); and
- What sense of satisfaction and or pleasure users felt when using the site (satisfaction) (Nielsen, 2012).

Our own methodology derives from these characteristics and includes the use of think-aloud protocol (TAP) and focus groups to assess user perceptions. TAP allows users to verbalize their immediate thoughts while performing a task, without allowing any additional internal assessment (Saad et al., 2022). Focus groups contribute to usability testing by revealing users' (in this case, CCL program stakeholders') desires and perceptions through their own words and interactions (Denton et al., 2016).

Accessibility

As conscientious communicators, CCL professionals should also attend to accessibility, an important aspect of usability that considers how usable something is (in this case a website) for people who have auditory, physical, speech, visual, cognitive, learning, or neurological disabilities. The United States Census Bureau estimates that as of 2021, 13.5% of the general population in the United States had a disability. Non-institutionalized Americans with a disability were over 20% less likely to earn a bachelor's degree than those without a disability, almost 36% less likely to be employed, and over 13% more likely to live in poverty (Houtenville et al., 2023). In the United States, at the time of this writing, federal law, particularly Section 504 of the Rehabilitation Act of 1973 and Title II and Title III of the Americans with Disabilities Act, mandates that post-secondary schools receiving federal funds be accessible in brick-and-mortar and virtual worlds. Despite these requirements, institutes of higher education often fall short when it comes to online accessibility (Thompson et al., 2010; Erickson et al., 2013; Taylor & Bicak, 2019), a problem highlighted by the move online during the COVID-19 pandemic (Meleo-Erwin et al., 2021). Online accessibility is hindered by common website design issues, such as lengthy load times, poor content layout, and too much text (Gilbert, 2019). These annoyances can make websites inaccessible to users with disabilities, which will result in these users leaving the site (Gilbert, 2019; Norman, 1999).

U.S. accessibility standards are based directly on the World Wide Web Consortium's (W3C) Web Content Accessibility Guidelines (WCAG), which provide developers with guidance on how to make their web-based content accessible to users with disabilities. The W3C introduced WCAG in 1999 and updated to version 2.0 in 2008. WCAG is based on four accessibility principles, usually abbreviated as POUR. Web products and content need to be perceivable and include alternative ways to display text and non-text content. Products need to be operable using different types of controls, including voice and keyboard, and should not rely on the ability to use a mouse. Content needs to be understandable: it should display and work in consistent ways and users should be able to complete tasks and recover from mistakes easily. Finally, the products should be robust, working with different platforms, browsers, and types of assistive technology. WCAG guidelines are divided into three compliance levels, A, AA, and AAA. Level A and AA guidelines are "must follow" guidelines, while AAA guidelines should be followed when possible with the understanding that compliance may not always be possible (*Web Content Accessibility Guidelines [WCAG] 2.1*). In October 2023, WCAG officially updated to version 2.3. As we conducted the current research prior to that date, our research is based on compliance with WCAG 2.1.

Researchers trying to identify accessibility barriers and features usually select from among three basics paths: user-based testing, expert analysis, and automated analysis using tools (Jaeger, 2006). These tools and analytic resources include WebAIM's WAVE and AChecker, which analyze individual pages, and SortSite, which does sitewide accessibility and usability testing. Each technique brings specific advantages and drawbacks. Automated tools can provide a quick overview of webpages, and sometimes entire sites, to help identify key problems. From that perspective, they can be helpful for developers trying to put together a list of problems to address. On the other hand, these tools are fallible and can generate both false positives and false negatives. In addition, they have functional limitations. For example, a tool may be able to tell if an image has alternative text (ALT text), but it cannot readily assess the ALT text's quality. Nor can these tools typically check for captions or audio descriptions. Expert analysis, including walkthroughs, offers greater detail and allows the testing of processes. User-based testing offers the perspective of those who can best judge how well a product performs in terms of accessibility—the actual user. As detailed in our methods section, the current study used a combination of automated testing and expert analysis, which included a site

walkthrough using a screen reader (Apple's VoiceOver). CCL professionals may elect to work with information technology and accessibility offices to identify the best available tools on their campuses.

University Writing Website History

Although University Writing has had a website since its early years (the program began in 2010), several changes led to a website redesign in 2021. First, the program experienced a leadership change when the inaugural director stepped down, and Basgier stepped in to lead the program. Working with a communications and marketing team in the Office of the Provost, Basgier took the opportunity to refresh the University Writing "brand" with new program icons, new logos, and a new color palette. The website at that time was in dire straits: it was built on a WordPress installation that the institution no longer supported, and old plugins routinely broke any time the site was updated and republished. Additionally, as the COVID-19 pandemic wore on and attendance at WAC workshops and writing center appointments remained sluggish, Basgier and the other University Writing administrators saw an opportunity to create an open educational resource (OER) of existing worksheets and handouts created over the program's history for students and faculty to use asynchronously (Brown et al., 2023). The idea stemmed from the success of our office's ePortfolio resources, which had enjoyed national recognition. For example, from May 2017 to May 2018, our "ePortfolio Examples" page had over 92,000 page views, and pages about artifacts, visual design, audience, and reflective writing each had between 600 and 900 views. The number of page views can serve as a measure of site engagement and may be used to determine its operational performance; notably, other factors, such as user browser activity and website design characteristics, may also influence site performance (Lee et al., 2011; Yom-Tov et al., 2013).

For these reasons, we sought to create a cleaner, more navigable site that showcased programming, resources, and new branding, with the wider goal of engaging our program's many stakeholders: faculty, students, and other administrators. To accomplish this goal, we contracted with a web designer from the university's Office of Information Technology, who set about building a new site using the university's preferred content management system. This new website launched in the fall of 2021, and it was essentially the same website used for this study, with only minor changes in content and cosmetics.

CCL professionals may decide to evaluate and redesign their websites for many reasons, such as a new mission, changes to institutional communication policies, or needs assessments of faculty or students. Several exigencies led us to conduct a usability study of the new University Writing website two years after the initial re-launch. First, the university announced a campus-wide rebranding initiative with a standardized, but flexible, set of fonts, colors, and templates for use across the institution. As a result, University Writing once again received an updated set of logos and icons and a new color palette. Meanwhile, we regularly witnessed "brand confusion": despite our efforts to unify everything under the mantle of University Writing, faculty regularly referred to our office as the writing center and overlooked our WAC programming. Likewise, the program's administrators were concerned that the site did not provide a smooth user experience. They knew some pages were too buried, such as a form to request an in-class workshop or presentation. Other pages did not have a clear purpose for users who were not already familiar with institutional lingo, such as the "Writing Plan Support" page, which included information about a departmental writing plan mandate that had been sunsetted. Additionally, high-priority pages, such as the writing center information page, could not be accessed everywhere on the site, potentially necessitating many extra clicks, leading to user fatigue, and ultimately preventing them from making writing center appointments.

Therefore, in spring 2023, Basgier contacted Ross and Youngblood, who run a usability lab in the university's College of Liberal Arts, to conduct a usability study and craft a set of recommendations

for the next iteration of the website. At the same time, we saw the opportunity to answer four research questions (RQs) regarding University Writing and CCL more broadly:

1. What are some of the main usability and accessibility problems that need to be addressed during the redesign process?
2. Relatedly, what accessibility problems need to be addressed during the redesign?
3. What information do different CCL stakeholders expect to find on these sites?
4. How do they expect to see the information organized?

Methods

The overall goals for this study were to identify the site's key usability and accessibility problems (RQ 1 & 2) and to get a better sense of what users expect to see when they come to a writing center and WAC website and how they expect to see the information organized (RQ 3 & 4). To address these goals, we took a multipronged approach. First, we ran an automated usability and accessibility analysis using PowerMapper's SortSite. SortSite spiders an entire website and provides an analysis of site errors, including broken links and scripting errors; accessibility errors based on WCAG 2.1; compatibility issues with desktop and mobile browsers; potential US CAN-SPAM and EU Privacy Regulations violations; search engine best practices, use of valid HTML and CSS; and usability issues based on usability.gov guidelines, W3C Best Practices, and text readability based on Gunning Fog reading age. All of these factors may impact CCL stakeholders' experiences with the site, and thus their ongoing engagement with CCL programs and resources.

Next, Ross and Youngblood conducted an expert analysis of the site, with Ross focusing on a holistic design overview and Youngblood focusing on accessibility. We conducted the holistic design overview using Chrome on a 13-inch MacBook Pro and an external 27-inch monitor, and examined all major pages and a sample of subpages. In the process, we applied basic design heuristics, checking for aspects such as white space, contrast, number of links, and use of icons and other images. We completed the accessibility analysis in Safari on a 16-inch MacBook Pro using the built in VoiceOver screen reader, which can simplify reporting data to the client as it provides a visual listing of hyperlinks, headings, and other key features, in addition to reading the information. This feature allows the inclusion of screenshots to help non-screen users understand problems (see, for example, Figure 1). We relied on Safari rather than Chrome as our experience suggests that Safari integrates better with VoiceOver. We examined eleven pages in detail and completed the major tasks also employed in the hands-on usability testing component ourselves.

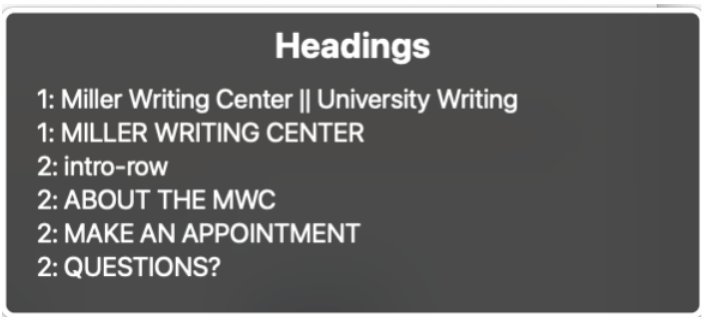

Figure 1: Screen reader view of Miller Writing Center headings.

We tested overall site usability by recruiting three groups of representative users: undergraduate students, graduate students, and faculty. Participants were recruited via flyers posted in the writing center, as well as emails Basgier sent to recent writing center users, participants in graduate programs, and faculty collaborators. Participants received a $20 gift card for their time. Each group came to the research lab and completed tasks using a think-aloud protocol. Group members were assigned to one of two experimental rooms, both of which had four comparable Windows-10 based

PCs with identical 21" monitors. The computer desktops were configured the same way and had icons for the Chrome, Firefox, and Edge browsers. We used TechSmith's Morae recorder software running in autopilot mode and a Logitech web camera to capture participant interactions, utterances, and expressions. We imported the resulting recordings into Morae Manager for subsequent analysis, which included demographics, time on task, and task success rates. In the process, we also looked for specific points where participants had problems. As previously mentioned, these processes are intended to assess learnability, efficiency, error occurrence and recovery, and satisfaction, with downstream effects on CCL program engagement and visibility. Memorability may also be apparent during TAP sessions if a user recalls something from previously visiting the site or something that they ran across during a previous task. All three groups began with basic demographic questions and questions about how often they used the website and what types of devices they used to access the website, followed by a standard opening task, "please go to the University Writing Center webpage." This task allowed us to see how participants might typically find the writing center website. After each task, users were asked to use a 5-point disagree-agree Likert scale to respond to two statements, "Overall, this task was (very difficult to very easy) and "I feel confident I completed this task successfully (strongly disagree to strongly agree)."

We gave undergraduate and graduate students the following additional tasks:

1. Find and read out the university writing center's hours of operation.
2. Navigate to the page where you would start making an appointment with the university writing center.
3. Find someone who can help you with MLA style for a class paper.
4. You want to work with the writing center. Find opportunities for jobs.
5. Find the writing center's calendar.
6. Show where you would go on the site to register for an event.
7. Bring up an example of an ePortfolio.
8. Navigate to the university writing resources page and bring up a document about literature reviews.

Faculty received a different group of additional tasks:

1. Find and read out the university writing center's hours of operations.
2. Find contact information for the writing center's full-time staff.
3. Find information about jobs for student workers.
4. Find general information about our programs or events.
5. Show where you would go on the site to register for an event.
6. Find examples of ePortfolios.
7. Find a specific set of resources you might use for class.
8. Find out how to request an in-class workshop or presentation.

These tasks represent commonplace ways CCL stakeholders might interact with similar programmatic websites. After completing the tasks, participants filled out a System Usability Scale (SUS) questionnaire, which is a standardized tool used across industries to assess general levels of usability on top of the more directed tasks in the study. SUS uses ten 5-point Likert-scaled questions that alternate between positive and negative site attributes (Brooke, 1996). A list of the questions

can be found in Table 1. The Likert scores are then used to provide an overall site score between 0 and 100, with a score of 68 being considered an average score (usability.gov).

To address RQ3 and RQ4, which asked what users expect to see when they come to a writing center website and how they expect to see the information organized, we followed each of the three usability testing sessions with a focus group. We recorded and transcribed all three focus groups.

Findings

Six undergraduate students, five graduate students, and seven faculty participated in this study. Participants reported that they accessed the site primarily by computer and mobile phone. Table 1 includes the average responses to the Standard Usability Scale questionnaire regarding participants' experiences using the website. On average, participants agreed that they would use the site frequently, that its functions were well integrated, that most people would learn to use the site quickly, and that they felt confident using the site. At the same time, they were at least neutral, or else disagreed, that the site was unnecessarily complex, that they would need technical help to use it, that it was cumbersome to use, and that they would need a lot of knowledge to use it. Despite these generally positive results, the task-based analysis and focus groups indicated several aspects of the site that could be improved.

Table 1: Average Responses to Standard Usability Scale Questions

	Average
I think that I would like to use this site frequently	3.44
I found the site unnecessarily complex	3.0
I thought that the site was easy to use	3.9
I think that I would need the support of a technical person to be able to use this site	1.39
I found the various functions in this site were well integrated	3.56
I thought there was too much inconsistency in this site	2.56
I would imagine that most people would learn to use this site very quickly	3.78
I found the site very cumbersome to use	2.39
I felt very confident using the site	3.94
I needed to learn a lot of things before I could get going with this site	2.17

Initial focus group responses to the site were positive. Undergraduate students indicated that they appreciated the relatively simple and "straightforward" nature of the site, and graduate students commented on the visual appeal, noting that it "looks nice." Faculty immediately noted the visual appeal of the site, with one commenting that site updates within the past two years were good and that the site appeared "more organized than before." These notes on visual appeal speak to satisfaction, and they indicate a positive (and hopefully increasing) association with memorability. Faculty also discussed using the site in their classes, and expressed gratitude for the support—again, points that speak to satisfaction. However, in focus groups and user testing, participants shared challenges regarding navigation, information, technical elements, and branding, all of which constitute potential obstacles to CCL program engagement, visibility, and sustainability.

Navigation Challenges

If visibility is a key sustainability strategy for CCL programs, then their websites should be easy to locate and navigate. This was sometimes a challenge for our research participants. Although most were able to locate a version of the website, they did not always find the current one. As it turned out, a legacy version of the site appeared in Google search results, which was the most frequent way participants found the website. They typically used search terms like the following:

- Auburn University Writing Center
- AU Writing Center
- Auburn University Miller Writing Center website
- Miller Writing Center

In all cases, the Google search returned the writing center website as one of the first results. That said, the search also took them to an old version of the site, leading to confusion. For example, one graduate participant typed the university's main web address into the web browser's address bar and then went to "Students" from the top options on the hamburger menu. On the "Current Students" page, she went to the "Academic Success" section and then to the "Writing Center" link. When she clicked on the link, she received a page not found error, noting, "Got a 404 page. That's not good." Figure 2 shows the link on the "current students" page, along with the accompanying 404 error. After getting the error, she used a Google search, typing keywords into the web browser's address bar. Similarly, an undergraduate participant remembered using the website before and typed "auburn.mywconline" into the web browser address bar. One of the first results was a WCONLINE administrative page, which she decided was the writing center home page. While there was a link to the website on WCONLINE, she did not appear to see it. For writing centers in particular, scheduling platforms like WCONLINE may be perceived as the center's website, which could prevent students from accessing other vital information that could support engagement.

These navigation challenges persisted during site use. During a focus group, for example, an undergraduate student noted that they found the multiple clicks and link jumping prevalent on the site confusing. Another noted, "It's very easy to get lost in like a long string, of just like 'click that.'" A graduate student echoed this point: "They could have been a little bit more direct … Everybody knows to use the menu button." That same participant later added, "If the student has to dig around, especially a freshman and sophomore if they're digging around for thirty minutes just to find a way to find somebody to proof their paper and help them write in APA, they're not going to do all that." These site-side link and navigation errors detract from what we would consider an ideal user experience. They prevent users from completing tasks, meaning that no positive impressions can be formed (memorability), impeding learning and obviously decreasing efficiency and satisfaction. Frustrated or dissatisfied CCL stakeholders are less likely to engage in the future or support program visibility via word of mouth.

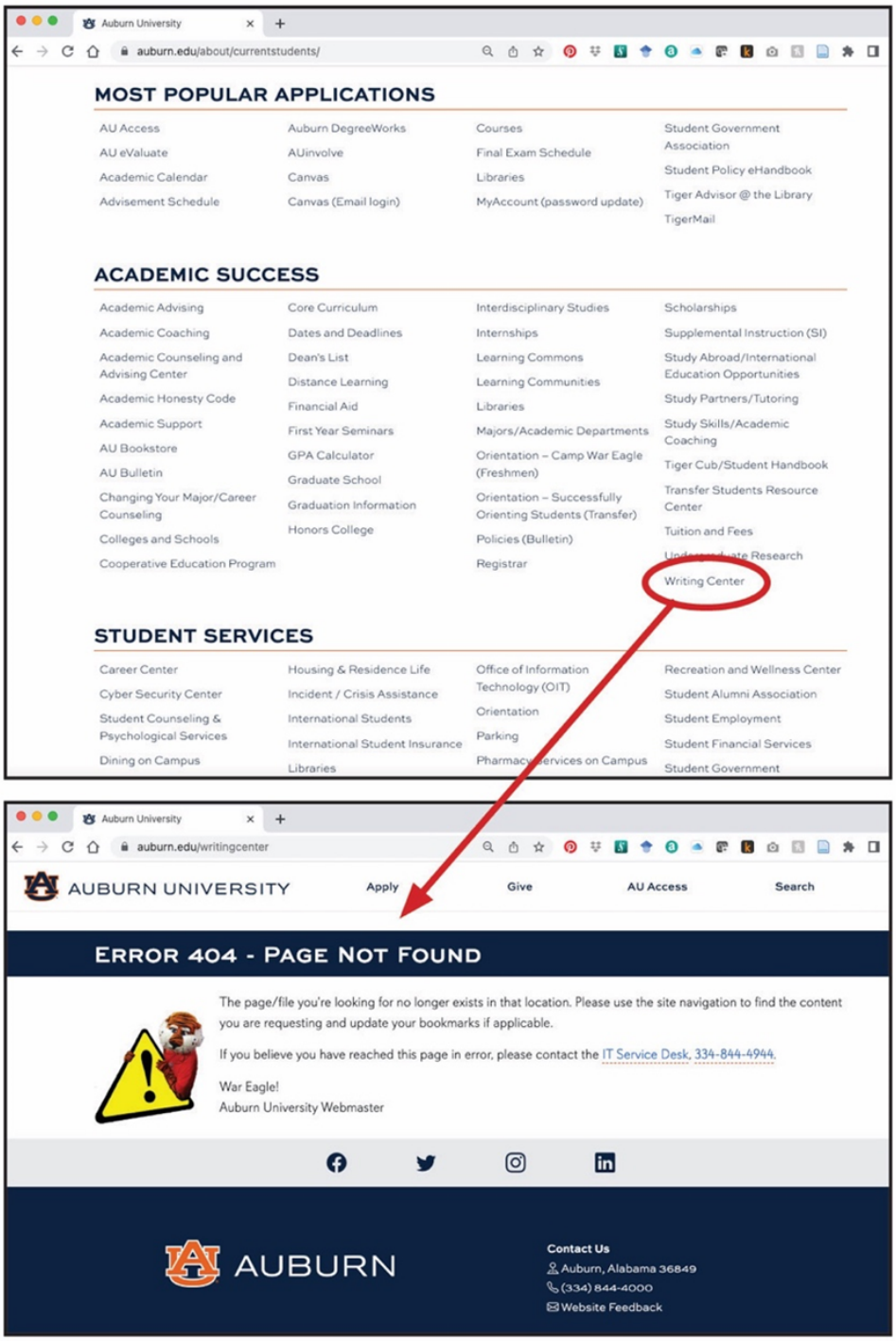

Figure 2: Placement of Writing Center link on the university's "Current Students" page accompanied with the 404 error message that appears when the link is clicked.

This problem may be exacerbated when students face obstacles in making writing center appointments or when faculty are unable to register for professional development programs. Indeed, when our student participants were asked to make an appointment with the writing center, many stayed on the old version of the home page to do so. While participants could follow an instructional

document linked on the website, most seemed frustrated by needing to move between the document and the browser. One graduate participant was particularly resistant to using the instructions and initially looked for another way to complete the task. Two participants used Google to locate a link for the university's single sign-on portal, which should have sent them to WCONLINE. Unfortunately, the link provided by Google took the users to a different authentication page for the university, one that looks similar. Participants were coded as having completed the task if they found the WCONLINE page to create an account or completed the registration process. Two participants did find the correct link to do so, but they received an error (Figure 3) when they clicked on the link and could not complete the task. Again, these errors, including the lengthy time-on-tasks that the problematic links created, detract from learnability, efficiency, memorability, and satisfaction, and speak to errors that users cannot overcome easily.

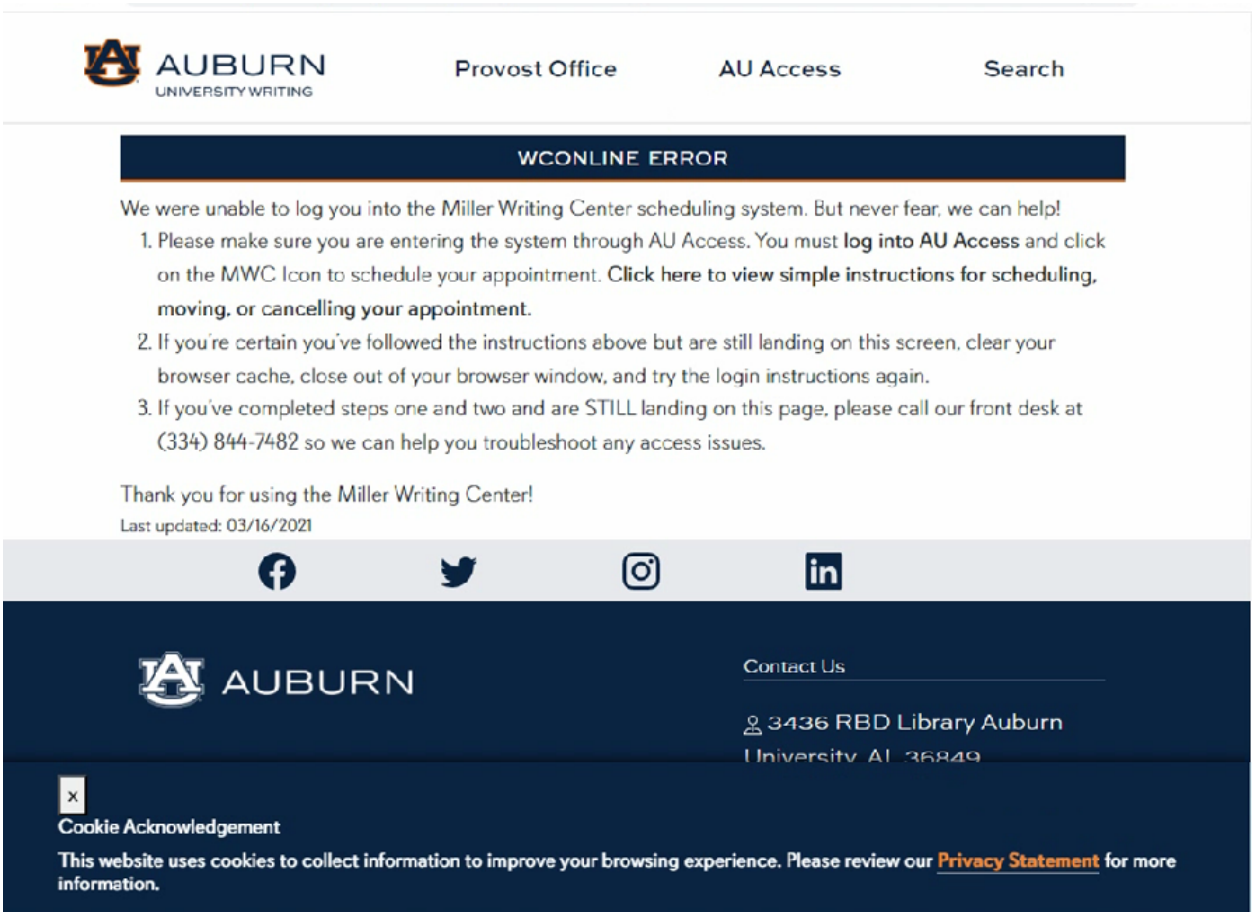

Figure 3: Figure 3: WCOnline error message.

Sometimes, page titles did not appear to help participants navigate the site to accomplish tasks. For example, one faculty participant was not able to complete the task of registering for an event. They tried going to the "Presentations, Workshops & Consultations" page from "What We Do," commenting that they were "wrong and surprised" that the information wasn't there. After some deliberation, they then tried "Resources," and then went back to the University Writing home page. They did not appear to recognize that the "Upcoming Events" information on the homepage would take them to a calendar with registration links. They eventually went to "Faculty and Staff Programs" and clicked on the "Register for Programs" link under the Faculty Programs heading, which returned a page not

found error. Organization errors like these prevent users from learning efficiently and decrease user satisfaction.

Accessibility testing likewise revealed obstacles to effective navigation, which can also interrupt learning and frustrate users. Some hyperlinks were inconsistent, sometimes beginning with "www" and sometimes not; frequently, links with the same text pointed to different URLs, which could also lead to confusion. Overall, accessibility and automated usability testing identified more than 30 broken links. Additionally, we found duplicate, missing, or misplaced HTML elements, page titles, and anchor IDs, all of which can interfere with site navigation, especially with screen readers. These challenges to navigation and accessibility may have downstream effects on CCL program engagement: when stakeholders face too many navigational obstacles and unnecessary digital clutter, they are likely to quit trying.

Information Challenges

Similar obstacles can arise for stakeholders who are trying to access the kinds of information typically housed on CCL program websites, such as programs, services, events, and institutional policies. During our study, both student groups described difficulties locating information relevant to students on the University Writing website. For example, one undergraduate student recalled that they used the site once as required by a teacher, but the next year they could not find the resources they had previously used, so they gave up on the site. The lack of site consistency had created a barrier to memorability, resulting in (at least) one less set of student eyes on the site, and thus less visibility for that demographic.

A key issue was that some information on the site was difficult to locate spatially. While most participants found the writing center's hours, multiple participants commented that they expected to see the hours at the bottom of the webpage, not in the middle of the homepage where they were located. Faculty, too: one participant initially tried using the university-wide search tool for "hours of operation," but found "that was not a helpful way to search," and returned to the University Writing home page, where they found the hours.

Some participants also struggled to locate writing center peer consultants' specializations. Participants had two options for finding this information—in the dropdown menu when making an appointment in WCONLINE or on the list of Peer Consultants on the writing center page. The information was part of a bulleted list on the old version of the site and was available by clicking on the consultant on the new version. Five of the six undergraduate participants completed the task: two undergraduate participants used the Peer Consultants page on the old site, and three others used the dropdown in the registration tool. One participant could not complete the task and found it "surprisingly difficult." She tried various approaches, including browsing the "What We Do" and "Resources" pages. She also tried the university-wide search tool at the top right of the site, to no avail. CCL stakeholders who face such challenges may be less likely to see their needs reflected in programs and services and therefore decide not to engage, a point we return to below under "Brand Challenges."

When program information is difficult to locate, CCL professionals may also struggle to recruit highly-engaged volunteers of the sort Cox, Galin, and Melzer (2018) recommend, as well as paid staff. For example, both student groups had trouble finding job opportunities with University Writing. Participants on the old version of the site tended to quickly hone in on "Student Opportunities" under "What We Do." Unfortunately, selecting that link generated a page not found error. Participants who did find the "Student Opportunities" page on the new site tended to spend a lot of time looking for the employment information because it was far down the page. Several participants opted instead to follow the Employment link in the page footer, a template element that led to the university-wide

student employment site. While there was a position listed (for a front desk representative), the employment page did not have information about the other positions listed on the University Writing website. Participants mentioned they expected a clear spot on the site to find jobs, such as a tab that said, "Work with Us." One undergraduate participant finally gave up and said, "I guess I'd have to email the Miller Writing Center and say hey, do you have a job?" Without that consistent and expected presence (in this case for employment, but the concept applies to most instances where specific information does not appear as expected), user satisfaction likely decreases as users are thwarted in their ability to quickly and efficiently perform what is perceived as, and expected to be, a simple task. Engagement with the CCL program may then be viewed as too complicated, or too disorganized, to be worth the time.

Faculty expressed similar challenges in locating job information. Only two participants considered the task to be at least relatively easy and two found it very difficult. Several participants began by using the "Student Opportunities" link on the old version of the writing center website and received a page not found error. One participant tried the "Resources" page and then gave up on the task. Another faculty participant found student opportunities on the new version of the site but then had trouble finding the jobs and noted that most of the page was geared toward student programs. A third participant eventually used the "View our Programs" link from the University Writing home page to go to the student opportunities page and expressed some confusion that most of the information at the beginning of the page was geared towards student programs despite the label "Opportunities" in heading at the top of the page, commenting she was "looking for student jobs." A fourth participant also expressed confusion about the content of the student opportunities page and seemed to have missed the "Opportunities" heading, commenting, "I found a student programs page." Part of the problem may have been the page layout (see Figure 4). The top heading simply read "Opportunities" while the buttons that linked to it were "Student Opportunities" and "Student Programs." The doubled "Student Programs" heading may also have contributed to the confusion.

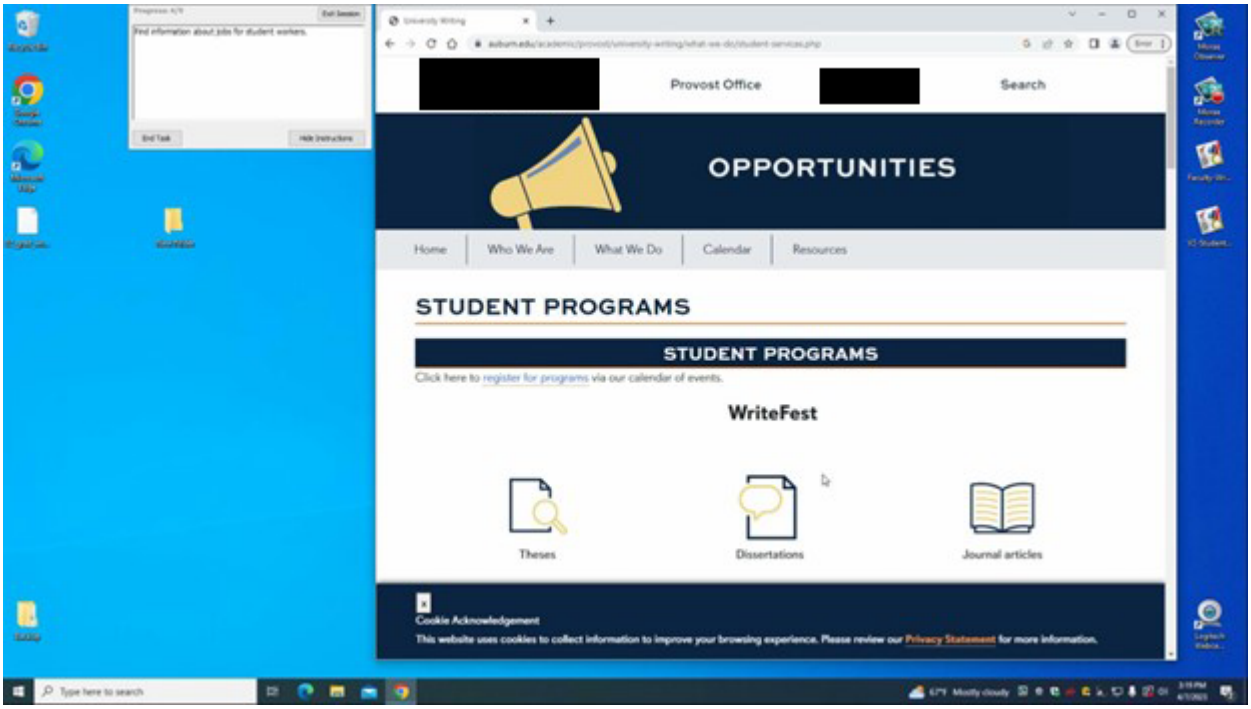

Figure 4: Multiple descriptors ("Opportunities" and "Student Programs," for example) may cause confusion)

When CCL programs have high-priority projects such as a summer WAC institute or a Quality Enhancement Plan for accreditation (McCrary et al., 2022), those projects should be highly visible on the website, with information easy to locate. University Writing's ePortfolio Project was one such project, but the task of locating ePortfolios also posed challenges for our participants. An undergraduate participant found the ePortfolio examples but had trouble doing so and started off looking through several pages including "Resources," "Who We Are," and finally, "What We Do." Once she got to "What We Do," she quickly located the ePortfolios. Another undergraduate moved off the appointment page but was unable to locate the ePortfolios, in part because she seemed unsure what an ePortfolio was. A third undergraduate located the ePortfolio page quickly but skipped over the examples section. A graduate participant struggled with the task because of the legacy site. Again, such frustrations with learnability, efficiency, and memorability (it is hard to remember where something is if it is not where you expect it to be) all contribute to decreased satisfaction with the site.

We also noted crucial missing information in the accessibility testing that could hinder CCL program engagement and conflict with stated program commitments to accessibility. For example, the University Writing page language was set to "EN," rather than "EN-US," which would aid screen readers in telling users what version of English the site used. Likewise, many of the icons on the site were missing part of the alternative text and read "alt" rather than "alt=". This omission accounted for many of the missing ALT attributes SortSite detected.

Broadly speaking, participants were challenged by the overwhelming amount of information on the site. Two faculty participants visited the "Presentations, Workshops & Consultations" page and commented that there was a lot of text on the page and that it was hard to read through the text, with one stating, "I'm not sure somebody's going to read all that text." This point arose in focus groups as well. In addition to the difficulty navigating to relevant information, faculty agreed that there is "too much text in places," and that they didn't want to read descriptive elements when just looking for key information or links. On this last point, at least one participant said they found links "buried in some text" when they wanted to send students direct links to sign-up or registration information. One faculty participant summed up this lengthy topic of conversation: "I don't need to know everything about something to know that I want to register for it and then just get me, get me with the task done."

The amount of information on the Resources page, a common feature of many CCL websites that support writers and writing instructors, was a particular area of concern for all participants. Students noted the "overwhelming" amount of information, suggesting that the search area be clearer and that the large block of resource tags was "hard to differentiate" (Figure 5). While keyboard searching (control + F) is common, one student noted, "You shouldn't have to control + F to find all that stuff." Graduate students also said that more curation would be valuable because using keyword searches pulled up too many results. They also said that the page felt "more like a blog" than expected. The size of the "Resources" page posed an accessibility problem, too: the sheer amount of information could be a challenge for non-screen users, and the amount of content was potentially overwhelming for no/low vision screen reader users. Indeed, the page has 1014 links and 45 headings, which could be intimidating for users attempting to create a mental model of the site by listening to the page structure.

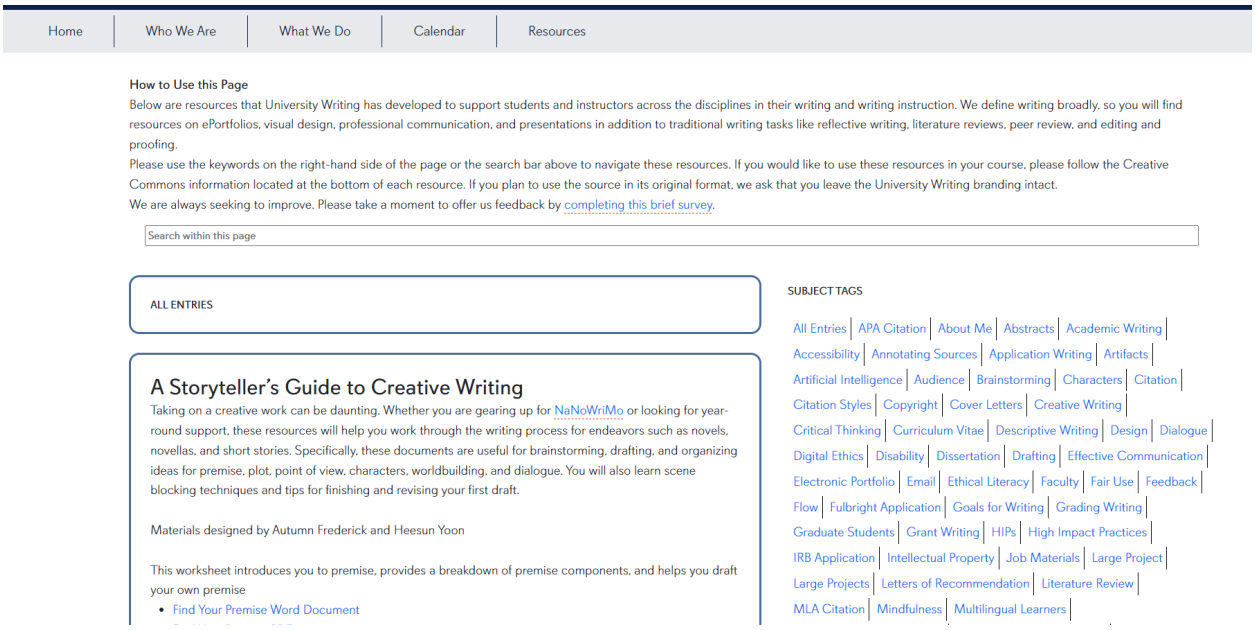

Figure 5: The subject tags to the right were overwhelming for some participants.

Finally, unnecessary or repetitive information also appeared in the accessibility test. For example, as shown in the list of University Writing Team Links (Figure 6), each item for each person is listed as a separate link (name, email, and phone number). Each person's name is listed twice in the list of links. The first time is the biography section, accessed by clicking on their image. The second time is their name as written below the image, which links to the biographical section. Unnecessary repetition and disorganized information are challenges for communicators of many stripes; CCL programs should likewise remain cognizant of them when designing websites, especially amid the temptation to provide as much information as possible to account for every potential rhetorical need a stakeholder may have.

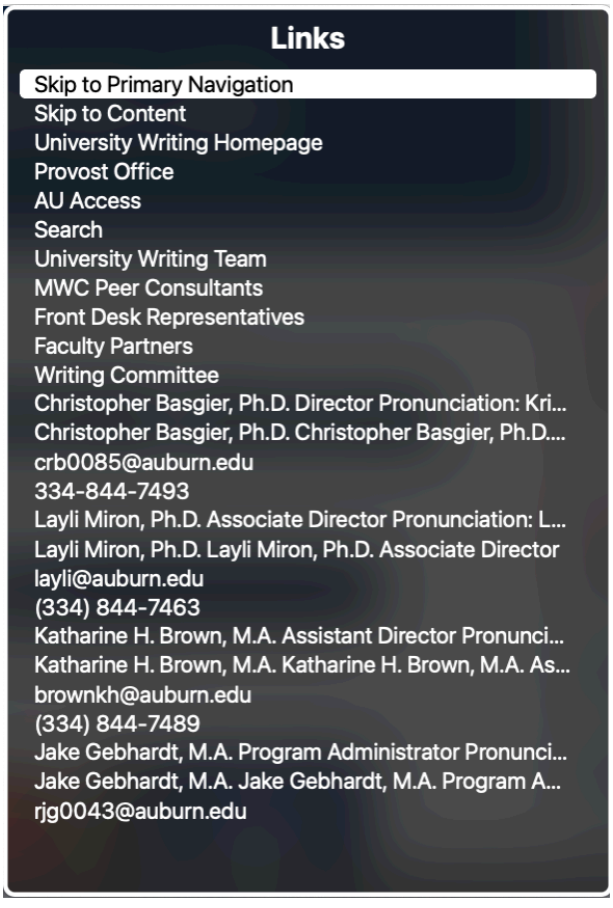

Figure 6: University Writing Team links. Screen reader view.

Technical Challenges

Several features that are common on CCL sites posed technical challenges for our participants, too. When asked to locate relevant resources on the University Writing webpage, most participants quickly navigated to the "Resources" page, but they were not sure how to use it. For example, one undergraduate who used the search bar (at the top of Figure 5) was

slightly frustrated that the phrase "lit review" didn't work because the search function does not search for wildcards or incomplete phrases. Likewise, a graduate participant had previously searched for "Electronic Portfolio" on the "Resources" page and could not remove the "Tagged Entries" information, which only displayed a subset of ePortfolio materials, until she used the back button and then returned to the "Resources" page. Two participants found the information using the tag option and two found the information using the in-page search tool. One noted that "there's a lot on this page here" and was slightly frustrated when she used the search tool and typed in "review" and the search results did not include the information she wanted, noting "it should work" and "I do not see it." When she typed in "literature review," she was able to find the information.

Faculty participants also sometimes struggled to use the "Resources" page. Although they did not seem to have a clear preference for using the "Resources" search bar or the tag list, one faculty participant commented, "Honestly, the subject list is distracting me." Conversely, another faculty participant began using the search bar to look for "business writing" but did not get any results so she moved to the subject tag list.

All the searchable pages, including "Who We Are," "Calendar," and "Resources," used dynamic page content: content in the page that changes, often based on user actions, without the page being reloaded. However, dynamic page content is problematic for screen reader users when they do not know that the information on the page has changed based on their action. Thus, a nice-looking technical feature became an accessibility challenge that we had not considered when designing the site.

Finally, CCL programs that attempt to make their sites more visually appealing (and demonstrate multimodal acumen) should be aware that images and links can cause confusion. Several of our participants were surprised when decorative icons were not clickable, which they mentioned when navigating the ePortfolio site. Meanwhile, text with clickable links did not always have apparent functions. For example, when we asked participants to schedule an in-class workshop or presentation, we considered the task complete if the participant identified or clicked on the "this Qualtrics form" link on the "Presentations, Workshops & Consultations" page. A faculty participant initially glossed over the link, and two other participants, while on the right page, did not recognize the "this Qualtrics form" link as the right one. One of these participants was specifically looking for a button to click and finally gave up, saying "I know [the administrators], I'd just email them." As is likely apparent, these frustrations again contribute to an overall sense of dissatisfaction with the site because many factors, including visual appearance and aesthetics, play into a site's usability, and those instances where perceived links (images) do not work as expected ultimately add to increasing frustration. Frustrated users may not be as likely to see CCL programs as credible communicators or valuable partners, leading to less sustained user engagement.

Brand Challenges

CCL programs such as WAC initiatives sometimes struggle to maintain a unique, visible identity, especially when they serve many stakeholder groups, share names with similar units, or exist within larger units like teaching and learning centers (Condon & Rutz, 2012). As mentioned above, University Writing already had concerns about name confusion before this study, and the study illustrated the problem in action. Of particular concern, in focus groups, some undergraduate students said they did not see themselves as the intended clientele for the writing center. They viewed the site as "only for English majors" and noted that "they don't have anything really related" for other majors (in this case, aviation management and materials engineering). A faculty member similarly remarked that it is worth reminding students that the writing center is not "only for

English." Although other writing center promotional materials regularly announce that services are for all students and all writing, the website did not, leading to possible confusion.

We also saw brand confusion during user testing. For example, a faculty participant started by typing the university's name into the web browser's address bar and then followed the link on Google to the university homepage. She clicked on the Employee option on the university home page and looked for "university writing." When she had trouble finding it, she used CTRL-F to search for "writing," which highlighted the link for the writing center. When she followed the link, it took her to the old version of the writing center website. We marked the task complete at this point, though the participant continued the task for another two minutes as she thought she was looking for the University Writing home page. She noted that the writing center is part of University Writing, but that "I know they are slightly different units." While looking for University Writing, she checked the Provost's Office page as she remembered that University Writing is part of the Provost's Office, but she could not find a link to University Writing. She then used the university-wide website search tool to find the University Writing website. When she opened the University Writing website, she seemed a bit confused to see information for both University Writing and the writing center, stating "There is a confusion between University Writing and the Miller Writing Center . . . For some students who don't know, or some faculty might be confused about these two centers." A similar issue arose when faculty searched for hours of operation: one participant noticed University Writing and the writing center had different hours and seemed surprised they were different as "I didn't really think there was a difference between these two things."

Branding challenges were somewhat different from an accessibility perspective. The University Writing logo with university branding read as "University Writing," which may keep someone from understanding what site they are on if they come to the site from outside the university. Likewise, the program icon, "Elevate Your Writing," did not include alt text. A longer description option, particularly for first-time visitors, would have let the user know more about University Writing. Such branding and accessibility challenges illustrate how CCL websites can either exacerbate, or potentially alleviate, problems with name recognition, and therefore visibility.

Discussion and Conclusion

The usability challenges noted throughout the study all suggest that a reworking of the site was necessary to substantially improve the overall user experience and enhance program visibility. As we previously noted, a site's usability generally relies on learnability, efficiency, memorability, and the prevalence of errors, all of which contribute to an overall sense of satisfaction (or dissatisfaction) (Nielsen, "Usability 101"; Nielsen, *Usability Engineering*). To that end, Ross and Youngblood proposed several suggestions for improving the site. Here, we wish to share those recommendations that are most pertinent to CCL programs that are in the process of (re)designing websites.

CCL programs that are redesigning sites should remove all legacy pages to prevent user confusion. Prior to removal, key words and images on legacy pages should be clearly documented. Following removal, searches should be conducted to ensure that all versions of the original/legacy site have been fully excised. Additionally, once the site is satisfactorily redesigned, developers and administrators should move content as little as possible so students can re-visit information across multiple years and classes. In so doing, they can support stakeholders' ability to locate resources and participate in programs and services, thus contributing to sustainable engagement.

When creating the site, CCL programs must curate content to support learnability and efficiency. CCL professionals like Basgier will likely be composing copy for websites. As scholars, teachers, and administrators committed to writing and literacy, we may tend towards elaboration in our writing. However, in so doing, we risk overloading users with too much information, which can limit site

learnability. The participants in our study were regularly thrown off by large chunks of text when they wanted essential information such as dates, times, job application information, and informational links. When they had to sift through long paragraphs, they could not perform tasks quickly, which limited efficiency. Additional information can always be provided in sub-pages, registration surveys, or follow-up emails; websites will work best by communicating enough information so users can understand what a given service, project, or initiative entails.

Indeed, CCL stakeholders may be more likely to register for programs, apply, or volunteer if they can glean what they need to know at a glance. The website should facilitate users' ability to find essential information quickly in the moment of need, a matter not only of efficiency but also memorability. Long pages requiring ample scrolling, such as University Writing's "Student Opportunities" page, hindered users' ability to find information, even when they had located it previously. To prevent this obstacle, shorter pages can be grouped navigationally in drop-down menus according to function and audience. For example, in combined WAC/writing centers like University Writing, separate menus for students and faculty can direct users' attention to relevant services, events, and resources as needed. Menu sections specifically focused on the needs of relevant audiences can increase memorability because users can navigate such menus efficiently and complete tasks proficiently upon return. Menus can also help with brand confusion, as users would know that they are desired users for the site. Furthermore, the authors recommended making the audience and purpose of the site clear and apparent on the home page with a brief statement in, or just below, the page header.

At the same time, the site should also follow commonplace ways of organizing web content—also a means for CCL programs to model attention to audience expectations. For example, our participants typically expected to find employment information and hours of operation in the site footer, and others wanted clear menus that allowed them to access any page from any other page on the site. Where possible, pages should be condensed or combined to eliminate an excessive page count and content and to streamline multi-step processes—while recognizing that there is a fine line between too many pages and too much content per page. If the site uses local search functions for resources or events, the search functions should be consistently present and obvious, and should make use of expansive search terms. For example, on the University Writing "Resources" page, "business writing" did not yield any results, but there were a number of business-related resources on the site including information on job posts, résumés, branding, and accessibility and writing. These sorts of changes can help users navigate the site efficiently and lead to overall satisfaction.

Accessibility also warrants proactive attention throughout the design process. All images and icons should have associated ALT text, which should be coded correctly. Sites should use generous margins and spaces between information or paragraphs to chunk text more effectively. In any cases where instructions for a process are required (registering for events, for example), written instructions should appear in HTML instead of, or in addition to, Word and PDF documents. HTML will be particularly useful for screen reader users.

Additionally, all action-based links should be easy to understand, either as underlined text or as large, obvious buttons, and all images that could be perceived as descriptive (facilitating content uptake) should link to related content where possible. On the University Writing site, some images were linked, but others were not, which led to confusion. A lack of underlining is an accessibility issue as users must mouse over the text to see what is linked—all links should be underlined. High-priority links, like writing center appointments or event registrations, should be especially visible and clear to direct users to appointment or registration systems. Users should be able to read a link in isolation and still have an idea of what the link will do. For example, a linked phrase like "To request a workshop or presentation, please complete this Qualtrics form," could be reworded as, "Request workshop or presentation (Qualtrics)."

Finally, we recommend CCL programs work with web developers to conduct iterative testing before launching a new or redesigned site. We understand that many institutions do not have access to usability labs and professionals. However, CCL professionals can conduct their own studies by creating tasks and reflective questions for their stakeholders and facilitating discussion of their experiences with draft sites. Writing center directors can utilize, and pay, peer tutors, who are already trained to give feedback on texts. WAC program or National Writing Project site directors can invite faculty and public-school teachers to participate at a reasonably low cost to the program, especially relative to the potential impact on site usability and program visibility. Whoever participates in such user testing, it is crucial that it includes more individuals than just the CCL professional and program staff because they may not always be adept at seeing the site from the users' perspective. They risk overlooking key design and content issues that can impact learnability, efficiency, memorability, and, ultimately, satisfaction.

More broadly, these usability factors should be understood as key elements of sustainable visibility for CCL programs. Perhaps there was a time when mere web presence was enough to contribute to program visibility, but amidst heavy workloads and information overload, user engagement must be a priority. CCL program stakeholders must be able to complete tasks easily upon visiting a site (learnability), whether they are school teachers registering for a National Writing Project summer seminar or undergraduate students seeking writing center feedback on a project. The more difficult the task, the less visible it is. With busy schedules, they must also be able to accomplish these tasks relatively quickly (efficiency). Faculty may be more willing to apply for a writing intensive course designation or a writing fellow if they are able to do so without spending too much time reading through complex content and trying to understand where links point. Visibility, in other words, is as much about the audience's ability to locate information as it is about campus- or community-wide recognition of the program. And if that audience can navigate the website easily upon return (memorability), they are also likely to be return participants in workshops, consultations, presentations, and other events or initiatives associated with the program. Indeed, websites are not just artifacts that give the CCL program a web presence. When built with learnability, efficiency, and memorability in mind, they are tightly bound to the health of the program itself because they contribute to the satisfaction of desired participants, without whom sustainability is impossible.

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