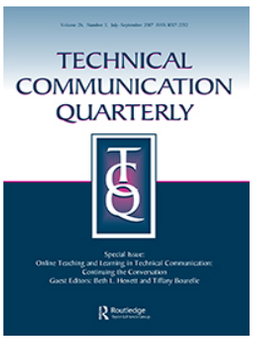

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Revising the Online Classroom: Usability Testing for Training Online Technical Communication Instructors

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ABSTRACT
This article reports on an effort by the authors to use usability testing as a component of online teacher training for their multimajor technical communication course. The article further explains the ways in which program administrators at other institutions can create their own usability testing protocols for formative online teacher training in course design and in principles of user-centered design.

KEYWORDS
Online courses; program administration; teacher training; technical writing; usability testing

Like all online settings, online technical communication courses vary in their degree of usability by students. A course's usability is evidenced by how easily a student-user can find and access course materials such as assignments, readings, modules, and other resources on the course Web site, such as videos, sound bites, or other media. Online courses, therefore, must be designed with usability in mind; similarly, in this special issue, Warner and Hewett (2017) argued that a course can and must be reviewed for readability, technical usability, and access. Often, design issues that impede easy usage of the course Web site can be found through usability testing. In usability testing, testers enter the course as if they are students and complete common user tasks while being observed. We suggest that usability testing can enhance teacher-training methods for online technical communication teachers, leading to more effectively designed courses. We foreground this notion of usability vis-á-vis online course design to reveal the central role important practices from the field of technical and professional communication (TPC)—usability testing and user-centered design (UCD) analysis—can play in teacher training, online course building, and instructional delivery for technical communication courses.

In the introduction to their special issue of *Technical Communication Quarterly*, Hewett and Ehmann Powers (2007) argued for considering students as users to improve online teaching. They stated, "Understanding how to teach online does not just entail learning new technology, which, of course, we must do to varying degrees; it also involves a deepening knowledge of how students respond to and learn in online settings" (p. 2). These users—students in online courses—have long shared anecdotal evidence about their experiences in online classrooms via course evaluations or in informal comments to instructors. Yet there has been little in the study of teaching technical communication that creates a systematic approach to assessing how students respond to and learn in such online settings. Scholars such as Blythe (2001) have advocated a user-centered (that is to say, student-centered) design approach in online courses. Likewise, Miller-Cochran and Rodrigo (2006) advocated using usability testing as a way to diagnose design issues in a course. We argue that instructor training is the necessary foundational piece for user-centered design and the usability testing of online writing courses. Other scholars have called for such an emphasis on user focus, which we respond to with the instructor-training component. By adapting TPC practices of usability testing to teacher training, we describe a program that trains instructors who teach TPC online,

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adding what has been missing from conversations about how and how well students learn in online settings. In this article, we outline how individuals responsible for training instructors—most often, program directors or administrators—can incorporate usability testing as a viable way to train instructors to develop or revise existing TPC courses.

It is no surprise that the conversation about online teacher training has not evolved to include usability testing of online courses given that training of any kind for online teaching remains scarce. As the online writing instruction (OWI) survey results discussed in *The State of the Art of OWI* (Hewett et al., 2011) quantitatively identified, training for the online environment at institutions across the country was relatively low. Of 158 respondents who were teaching fully online courses, only "48% indicated that they had some kind of mandatory training and 58% indicated that the training was optional" (p. 12). According to the OWI survey, instructors expressed dissatisfaction with the levels of support they receive regarding technology, training, and professional development support relative to OWI (p. 7). The survey noted "such dissatisfaction can lead to poor teaching, low expectations for students and for an online course, and insufficient retention of experienced instructors at a time when OWI continues to grow" (p. 12). It is clear that teachers and students in online classes can benefit from instructors' professional development in online teaching. Usability testing may be an effective and efficient way to provide such training.

Usability testing as a mode of teacher training fills a gap by offering a new approach for formative training for teacher-trainers at any institution. Specifically, the way we have designed and implemented a usability study of online courses developed by teachers within our institution's technical and professional writing program provides a model for other administrators. This article illustrates the technologies and the general methodology used to conduct the usability testing. We outline "low-tech" and "medium-tech" approaches to usability testing that can offer a promising addition to traditional online teacher training, offering training that allows teachers to form a deeper understanding of their own user-design choices in the online course Web site. In addition, we give administrators recommendations for establishing effective usability tests that can guide practices at their own institutions, and we provide ways in which administrators can use the results of the testing to implement or improve their existing online teacher training practices. We conclude by reflecting on how the usability testing has shaped our programmatic approach to teacher training, acknowledging the limitations of this method, and offering suggestions applicable for administrators at various institutions.

The results of the usability tests can offer instructors ways to improve their course design, which in turn aids them in creating effective online classrooms to enhance distance students' learning. Moreover, training online instructors through usability study methods gives administrators an extended opportunity to enculturate teachers of technical writing to the tools and habits of mind of the profession of technical communicators. The need for instructor enculturation addresses a reality at our own and other institutions: Those who teach our face-to-face and online TPC courses might not have worked in the profession themselves and may not be aware of UCD principles as a component of the work that professional writers and communicators perform on a daily basis. Because, as is the case at many institutions, our classes are staffed by a wide array of graduate teaching assistants (GTAs), lecturers, part-time instructors, and full-time faculty, a teacher training model rooted in usability testing best addresses teachers'—and ultimately students'—needs.

Usability testing and technical communication program administration

Usability testing and UCD principles have become a bedrock of theory for TPC scholars over the last 25 years (Chong, 2016; Mirel & Olsen, 1998; Rose, 2016; Salvo, 2001; Schneider, 2005; Sullivan, 1989). *Usability* and *user-centered design* are now part of the regular nomenclature of technical communication. Major textbooks in the field include chapters dedicated to usability testing and UCD (e.g., *Technical Communication Today*, 2015, by Richard Johnson-Sheehan and *Technical Communication*, 2015, by Mike Markel, two central textbooks in the field that dedicate significant

page-space to usability testing and UCD), and some programs have invested in developing their own usability testing courses and laboratories. The academic field's embrace of usability testing and UCD principles has been a boon to students who are looking for hands-on experience in experimental methods associated with usability testing. Through coursework, internships, and industry–school partnerships, students have never had more tools at their disposal to learn methods in usability testing and principles of user-centered design.

Usability testing, within higher-education contexts, has taken on a fascinating life of its own, presenting great opportunities for students to obtain hands-on experience with testing technologies that can benefit students and industry alike. What academic programs seem to have missed despite the proliferation of usability testing scholarship, however, is envisioning the incorporation of usability testing methods in another way, not just as a subject of study in TPC courses, but also as a foundational feature of online course design, course efficacy, and teacher training. Usability testing is usefully applied to a wide array of academic web arenas, from department websites and wikis to classroom learning management system (LMS) technologies. There are multiple missed opportunities for harnessing the growing popularity of usability testing methods for online teacher training purposes. Certainly, there is a degree of awkwardness in testing one's own usability, as in, within an individual's own series of classes, within a program's own courses, or in a department's available Web resources. Such testing might present challenges to established practices and design policies. However, at a time when the resources for using usability research methods in the classroom have never been more available (in terms of affordability and relative ease of use), it has become incumbent upon TPC programs to consider turning usability testing technologies inward and to begin assessing their own engagement with UCD practices.

One extension of usability testing as a teacher training mechanism for teaching technical and professional writing is in using the testing to enculturate teachers to the work of technical writers while preparing them to teach a technical communication curriculum effectively in an online environment. Our program, like many others, utilizes GTAs in many sections of our multimajor technical writing course. Occasionally, an instructor (often a GTA, but at times a part-time or full-time faculty member) may have professional experience in technical writing or editing, but this is the exception rather than the rule. At our institution, we have involved teachers who are new to teaching technical writing in a usability-testing project and have found that it is an opportunity to train them in some of the habits of mind of technical writing professionals. When teachers start to see their own work analyzed through the lens of usability, they have to begin thinking more comprehensively about principles of UCD. Adopting usability testing as a professionalization strategy for technical writing teachers not only grants administrators the ability to train teachers in composing user-centered course Web sites, but also helps teachers build a base of knowledge about practices used by TPC writers in the field. In turn, teachers can use that knowledge to give students more comprehensive technical writing instruction.

The following section presents a case study of usability testing for online teacher training for our localized context; however, the methods of testing illustrated are generalizable and can be tailored to different programs. Although there are many ways to approach usability testing online courses and making changes in light of test results, this study offers teacher-trainers of online technical communication programs practical ways to implement usability testing.

Online teacher training at the University of New Mexico

At the University of New Mexico, we offer all online instructors extensive training in migrating and adapting their pedagogies and curriculum for online delivery. This training also includes helping them learn how to teach their classes in this environment, which can be markedly different from teaching face-to-face (Hewett & Ehmann, 2004). Instructors are trained to teach within our online technical communication program, called electronic technical communication (eTC), which includes in its offerings a sophomore-level, multimajor introductory technical communication course, ENGL

219: Intro to Professional Writing. Instructors, who are mostly GTAs, must take two pedagogy seminars before teaching in this program. The first seminar is a traditional technical communication pedagogy course that has two central objectives: (1) informing new instructors in TPC of the theory and scholarship surrounding teaching technical communication, and (2) helping them design assignments that prepare students to enter the professional world after graduation as successful communicators of technical, often multimodal, documents. The second pedagogy seminar focuses on online pedagogies. In this seminar course, students read theory and design their online courses, which they will teach in subsequent semesters. When taking the seminar regarding online pedagogies, they are encouraged to redesign the curriculum they developed in the technical communication seminar for the online environment. The GTAs are required first to take the technical communication seminar because the latter seminar is for teachers of all online core writing classes at our institution, not just for instructors of technical communication.

Within a typical semester, the administrator of eTC offers more professional development opportunities in addition to the seminar, including workshops, one-on-one mentoring, and observations. One past workshop focused on designing videos or creating sound projects as multimodal instructional tools for the online environment. Another examined strategies for designing assignments for diverse student populations and focused on access-based approaches to assignment-creation that, in turn, would encourage undergraduate students taking the eTC course to consider accessibility in terms of the modes they use to create their projects. One-on-one mentorship occurs frequently throughout the semester when instructors need more guidance in grading or evaluating online texts or whenever other issues arise in the course of the semester. Lastly, the eTC administrator conducts observations every other semester, writing formal letters to instructors detailing strategies for enhancing course design and offering ideas for instructor improvement of their general engagement and interaction with students. These observations occur infrequently because the administrator of eTC receives one course release a year; therefore, the observations can only occur during the course-release semester.

In the interest of adding modes of teacher training beyond workshops, one-on-one mentorship, and observations into the program, the authors of this article—as the eTC coordinator (Bourelle), the ENGL 219 coordinator (Newmark), and the director of the TPC minor (Bartolotta)—collaborated to devise new ways to offer professional development that would help GTAs improve their courses through usability testing. This new approach to teacher training would acculturate the GTAs in traditional technical communication practices by immersing them in a usability testing process. Our conversation concluded with the realization that a new approach might be usefully piloted: Usability testing of eTC ENGL 219 courses by undergraduate students enrolled in our university's ENGL 290 course. The following section outlines these usability testing practices, including recruitment of instructors and student testers, as well as the methods and results.

Usability testing for teacher training

For usability testing, we recruited experienced online ENGL 219 instructors to participate; these instructors granted us permission to study their courses and, we received Institutional Review Board (IRB) approval for the entire study (comprising studying these online courses, involving undergraduate students as testers, and, as the final step, collecting survey feedback from the GTAs). Five instructors volunteered, prompting a search for an appropriate number of testers for the study (see the section below titled Recommendations for Usability Testing for more information on determining a sample size of testers). Undergraduate students in a foundational course in the TPC minor, ENGL 290 (Introduction to Professional Communication), seemed logical choices to serve as testers. The instructor of the selected ENGL 290 section (Newmark) adjusted her curriculum in the study semester to include a unit on usability testing and UCD. The instructor expanded the usability unit to include an opportunity for the 24 enrolled students to participate in authentic usability testing of 219 online course shells and to give feedback in the form of brief two-page memoranda.[1] One of the

memos was addressed to the instructor whose course they tested and included suggestions and observations about the usability of the online course. The second reflective memo was addressed to the testing moderator reflecting on the usability test process, what the student-rater learned, what was interesting or confusing about the process, and how usability testing might be applied to their future careers. In all, by reflecting in two documents to two difference audiences on the learning experiences usability testing afforded them, student tester-writers had an immersive experience with usability testing that went beyond merely reading about it. To this end, the goal was to afford students an opportunity to think about usability testing research as a component of a future career in TPC. Because we had secured IRB approval, we were able to share the recommendation memoranda with the TA instructors of the tested courses; this feedback channel was a critical component of the study. Upon reading these recommendations, instructors answered survey questions that prompted them to reflect on the students' suggestions as well as the changes they planned to make for future courses.

The framework of the actual testing instances bears further elaboration here. To complete 24 usability tests that examined the "Getting Started" sequence that constituted this overall study, the testing moderator dedicated 12 hours over a period of a week and a half to proctoring the tests. The undergraduate student-testers signed up for these 30-minute testing sessions with the director of the TPC minor (Bartolotta) overseeing; these sessions all occurred in the program's usability lab. The lab currently houses two computers and the software program Morae, a program that allows recording and analysis of usability tests performed on computers. This particular software can illustrate to the test moderator that sections of the course Web site the students stayed in the longest and which sections they skipped, potentially illustrating problems with the course design. Morae's framework allows for a recorder computer, which records testers' interactions with what they are testing, and an observer computer, on which moderators can observe the participants' actions on the recorder computer in real time and make notations in the recorded session. In fact, an administrator could set up a computer in another room and take notes on the testing session unbeknownst to the tester. The software proved useful, as we were able to use the testers' recorded sessions to examine places where particular tasks seemed to take longer than expected, examining the ways in which the testers lingered on some tasks or were able to complete others quickly. On a programmatic level, recording the sessions allowed us to explore what general design options seemed to be the most successful and talk through those ideas more in the training seminars and workshops currently offered through the eTC teacher-training program.

In the pedagogy seminar courses that all GTAs who teach online must take, GTAs create a "Getting Started" sequence as course introduction for their online classes (some using videos) that introduce students to the course, the instructor, and student learning outcomes. These introductions end with a direction for the students to perform some activity (usually involving posting something about themselves in an online discussion board). For the test protocol, undergraduate testers reviewed one course and examined this "Getting Started" sequence. It was important to explore the first interaction students have with the online courses. If the site is confusing to students from the beginning of the semester, it may negatively affect their experience as the course progresses. One of the nice components of the "Getting Started" module, in the way in which our program instructs TA course designers to use it, is that it allows instructors to use a diverse array of approaches to a common component of the course, to personalize it, as it were, to their own online teaching style. Because of this diversity in enacting the "Getting Started" area, we could use the test to observe and compare which teachers' approaches seemed to make for a fluid interaction with the course Web site for the testers, as well as which instructors' approaches were perhaps obfuscating. For example, results showed that the difference in the placement of a "Getting Started" link on the side navigation bar appeared to affect the usability of starting the module itself.

Although the recorded feature of the testing was certainly valuable for the administrators of eTC, the recommendation memoranda that the undergraduate student testers composed also were helpful.

In one sense, the memoranda gave undergraduate students experience in writing this genre of technical document, making the testing procedures relevant for all parties involved and providing instructors with feedback similar to what they might receive from their own online students.

The previously described testing scheme was made possible as a result of ample resources: Buy-in from faculty members, willingness to participate on the part of GTAs, availability of a preexisting usability lab, and the incorporation of a usability module in an undergraduate class that involved the undergraduate students as usability testers. Although not all of these aspects may be mirrored at other institutions for incorporating usability testing for online teacher training, the following section illustrates low- and medium-tech approaches that give administrators other possibilities for testing, depending on the resources available. Based on the results of the testing described above, we make recommendations to administrators regarding how to implement similar testing and use the testing results to facilitate teacher training for the online environment (see the section entitled "Recommendations for Teacher Training").

Low- and medium-tech approaches to usability testing

As illustrated with the described study, usability testing need not be a complex or expensive process, which is important because many programs and colleges are short on funding. This section presents two cost-effective approaches that will fit most programmatic and teacher-training initiatives. The first is a "medium-tech" approach that introduces methods for observing the user experience itself without intruding upon the testers who are actively using a Web site. The second, "low-tech" approach focuses on drawing upon qualitative tester responses to focused questions about the user experience of the online course Web site. The first approach generates more data for analysis; however, both approaches represent a robust range of options for testing usability and using that data to in turn shape online teacher training.[2]

Medium-tech approach

We consider our own approach presented in this article to be "medium tech," as we had access to computers and usability testing software. The usability lab where the testing took place was funded by a grant from the Office of the Vice President of Research, and administrators should look for similar avenues for funding at their own institutions or beyond (e.g., federal grants, etc.). In designing the grant that funded the testing described herein, we drew upon Garrison's (2013) description of how he designed his own laboratory. For instance, similar to Garrison, we acquired three computers (two acquired through a grant and one gifted by the Office of Informational Technology because it was decommissioned); video and sound recording apparatuses; and Morae, the usability-testing software. By far, the greatest expense for this task was the software. In all, we set up the "mobile usability testing lab" for under $7,000. Thus, depending on how much funding is available, an administrator can easily set up a similar lab. However, recognizing that funding can be scarce, we also recommend several low-tech options that are also viable options for usability testing.

Low-tech approaches

Low-tech approaches to usability testing primarily involve the direct observation of a tester using a product by a moderator. Low-tech approaches are often appropriate in technical writing courses when students watch as other students decipher and follow the steps of an instruction set, taking notes on moments when the testers lingered too long on one step, had questions, or expressed some distress at not being able to follow directions. All usability testing utilizes direct observation of testers using a product, but the difference between the low-tech and medium-tech models described here resides in how intrusive that observation is. The low-tech approach to usability testing tends to be more intrusive in that the moderator must engage in close direct observation of the tester, either

through the use of cameras (sometimes multiple and from multiple angles) or by physically looking over the shoulder of the tester during the test and taking notes about how the tester interacts with the product. At times, direct observation can seem awkward, but a tester fully immersed in the presented tasks can usually tune out the moderator.

Another low-tech approach to usability testing is to have administrators of online technical communication programs test an online course by having participants test a course Web site and follow a specific set of tasks or goals, asking the testers to complete a questionnaire or participate in an interview or focus group afterward. The role of the moderator (this could be the administrator) who is observing the test is to take copious notes on instances when the tester seemed confused or unsure of how to proceed in the task. The user's body language sometimes offers clues to the difficulty of the task. Some users in distress look back often at an instruction sheet to complete one task. Others may switch between pages, unsure which one is correct. All of the observed participant-user behavior—from exasperated sighs, to "ah ha!" moments, to appeals to the moderator for clarifications—are important moments worth recording. A low-tech approach is not necessarily a no-tech approach, and we encourage teacher-trainers at institutions with little funding to borrow video cameras from the campus information technology center to capture a tester's session. Even web cameras that are already installed on many computers can record useful user experience. Recording the test allows instructors and moderators to go back and observe certain moments of tester interaction with the online course Web site and analyze the data as a form of formative assessment of the composition of the course Web site.

Recommendations for usability testing

Whether one uses a medium-tech or low-tech approach to usability testing, there are some general guidelines that are useful for such tests. This section offers recommendations for usability testing procedures that first encourage administrators to consider how to design the testing procedures before focusing on how to use the testing results for training purposes.

Facilitating the usability test

Administrators should insist on using a quiet room with few distractions for the tester. A moderator should be present in the testing room at all times and be close enough to answer any questions the tester may have, but far enough away that the tester will not feel pressured by the moderator's observation. We recommend that the moderator not be the instructor whose course Web site is being tested so as to give the testers the opportunity to test the course in an anonymous context. Additionally, because we encourage instructors to record videos of themselves as a part of designing their course Web sites and course introductions, we did not anonymize the tested sites; however, the site can be revised to hide identifying information with the help of the institution's technical support group if the instructor wishes to remain anonymous.

Finding participants to test the LMS

As mentioned previously, our usability testers were undergraduate students who were enrolled in a technical communication undergraduate course. We suggest that administrators look to similar courses for testers. Students as part of an upper-division course could be recruited (or required) to participate in usability testing as a method of learning what the process is like; they could then be asked to write memoranda to the instructor whose site they tested, offering suggestions focused on how to make the course more user centered in its design. The limitation in choosing undergraduates as testers is that many of them may have taken a variation of the course they are testing, and some may have even taken the course online; their previous experiences with the course may bias their approach to a different course design when testing similar courses. Nonetheless, undergraduate students with backgrounds generated

from study in TPC courses are well situated to approach usability tests as student-users because of their knowledge of usability testing and technical communication practices.

Considering the partner approach

The participant approach we used involved having one tester at a time work at a computer; however, it is also possible to have two testers work together on a usability testing protocol. O'Malley, Draper, and Riley (1984) found that such paired testing could lead to "constructive interaction," in which the testers state out loud what they may otherwise only think to themselves, much like a think-aloud protocol. Administrators implementing usability testing can record interactions and use them later as a component of qualitative analysis. Likewise, van den Haak, de Jong, and Schellens (2006) found that "constructive interactions" are generally task oriented but not particularly descriptive because the testers focus more on completing the task itself rather than describing the general challenges they face with the product. Although this method leads to a smaller number of actual tests that can be performed with a pool of testers, the information itself can be more robust than an individual tester can offer. For more information on these approaches, see Cooke (2010), McDonald, Edwards, and Zhao (2012), and Zhao, McDonald, and Edwards (2014).

Determining sample size

One challenge in usability research is considering how many testers to have for a particular course Web site. How can one determine the sample size of the test? Older scholarship regarding usability testing sample sizes suggested that five user-testers could uncover about 85% of usability issues (Nielsen, 1993); however, more recent research suggested that sample size is more dynamic. Sauro and Lewis (2012) offered an examination of how different types of usability tests require larger or smaller sample sizes. Using research from Lewis (2012), Sauro and Lewis (2012) described two basic types of usability testing: summative and formative. Summative usability testing involves measurement-based evaluation, such as observing how long it takes a user to complete a certain task (e.g., finding where they need to upload an assignment) and then successfully fulfilling that task. The use of a measurement apparatus here (time, in this case) requires the study to look like a traditional experiment with more controls on the variables and a larger sample size. Formative usability testing focuses more on finding and addressing usability problems. Formative usability testing is more about discovering usability issues than measuring how well or quickly the user is able to operate the product. To this end, formative usability testing need not be as controlled as a summative usability test. For the purpose of teacher training, formative usability testing seems best, as this often requires a smaller number of testers.

Sauro and Lewis (2012) offered a thorough statistical explanation for how to decide what a proper sample size should be based on the probability of an error being detected by using a natural logarithm. Without restating their argument here, the general principle to remember is that a larger sample size will certainly catch more usability issues. However, a pool of only a few testers (four to seven) will reasonably uncover most of the issues users will face. Moreover, administrators could make the most of a small sample size by (1) having a few testers use the course Web site, (2) asking the teachers to address the usability issues and revise the site, and (3) having a new set of testers use the revised site. This way, the old issues should be addressed and settled, and the second set of testers will find new issues for the instructors to address in the course's next iteration.

Acquiring tester data

Another aspect that may require more attention is the proper composition of the tester pool so that this pool most accurately reflects the target population of the course Web site. As Faulkner (2003) stated:

> Although practitioners like simple directive answers such as the 5-user assumption, the only clear answer to valid usability testing is that the test users must be representative of the target population. The important and often complex issue, then, becomes defining the target population. (p. 382)

In the context of usability testing an online course website for technical communication, it is important to not only identify an appropriate representative sample of students but also to take into account their expertise with computers in general and online courses in particular. Student-testers who have taken online courses before will offer different responses from student-testers who have not. The multimajor technical writing course is sometimes the first course students have taken online, so some challenges in usability may be related to that sort of insufficient prior knowledge. Prior to testing, one of the best data points an administrator can acquire is how many students-testers have taken an online course before. These data can be available from an institutional analytics office or through a simple survey distributed to students as they begin their online course. These data in turn can help administrators focus on recruiting testers that best represent their target students.

Recommendations for teacher training

In the section above, we offered suggestions for administrators who are setting up usability testing protocol. Armed with usability data, administrators may wonder how to use the test results for teacher training effectively. In this section, we offer two possible ways to approach incorporating usability testing in online teacher training. Institutions will need to make methodological adjustments to suit their own context, but what we present here can serve as a point of departure and can be adapted to any programmatic context. Administrators should consider these options in collaboration with their online instructors.

Developing and revising master courses

As Rodrigo and Ramirez (2017) suggested in this special issue, the use of master courses for online teacher training can be a viable way to encourage instructor participation in online course development while simultaneously increasing professionalism. At the University of New Mexico, we also use master courses for instructors who enter the eTC program with online experience at other institutions. Here, the administrator of eTC (Bourelle) designs the master course as a model for the instructors to use in subsequent semesters, based on which they can design their own courses. In the previously described study, we also asked the undergraduate students to test the master course and provide feedback, leading to changes in the course's design. In keeping with what Rodrigo and Ramirez suggested, administrators who use master courses should involve instructors in ongoing course redesign; in fact, we would extend that argument, noting the importance of the usability feedback to collaboratively make changes based on student-tester responses. If traditional usability testing is not possible at an institution for various reasons, an administrator can lead similar tests with the instructor pool, asking all veteran online teachers who have used the master course to participate in usability testing of the course they used as their foundation and to help make changes they deem appropriate. Indeed, previous instructors of the course may be keen testers as they have taught the curriculum and received student evaluations regarding the teaching of the required curriculum. If a university is not using master courses for training purposes, the administrator should consider developing a course for testing to best learn the needs of the online students. The administrator can share the results with the online instructors, engaging them in discussions of what can be improved or revised.

Training teachers

As previously suggested, recording the testing sessions can open up more options for using the resulting data, including the option of sitting down with instructors and watching all or portions of

the testers' sessions and discussing surprising and expected actions. Administrators of online programs should consider using the recordings or results of the testing (i.e., low-tech options such as recommendations memoranda) to facilitate teacher training. Depending on what type of testing is implemented, administrators can even use the video recordings of the tests as artifacts to demonstrate to instructors how certain UCD strategies operate in practice. The recorded sessions and recommendation report data illustrate ways in which administrators can improve current training practices to include helping instructors create strategies for revising their course shells to respond to unexpected user interactions. For instance, testing these courses generally illustrates the need to be explicit with course due dates; we used these results to revise the curriculum of the pedagogy seminar, enabling us to stress to GTAs the need for clarity and redundancy when adding due dates to their courses.

The student-testers also reported detailed analyses of instructor "welcome videos," when they were included as a part of a Getting Started sequence. Student-testers commented on background distractions, video accessibility, and sound quality in their reports, demonstrating sophisticated understanding of video media. We passed along this information to specific instructors so they could think about how to rerecord or otherwise revise their "welcome videos" for future semesters.

Administrators should look for various trends in the testing results to make general changes to their own training approaches based on what they find. Specific workshops regarding the changes may be necessary, which could include helping instructors facilitate usability testing for their own courses, aiding them in identifying potential user problems themselves. In addition, administrators also can use the testing results to facilitate peer review of instructors' courses, pairing them together to review each other's courses in light of the testers' feedback.

Limitations of usability testing as teacher training

When implementing usability testing for teacher training, administrators must keep in mind that this or any other method is not a substitute for proactively addressing UCD issues and context-specific teacher-training challenges. It is unlikely that two users will have the exact same experience with an online course and, indeed, some users can register completely different interactions with the same course Web site. Usability testing offers a snapshot of how users are experiencing course technologies. It is the administrator's responsibility to perform the analytical work with teachers to decipher which design practices work best with their particular student communities. Although it may not be possible to articulate some general UCD principles that address all undergraduate user design challenges in every context, the discursive practice of taking and analyzing usability testing invites teachers and program administrators to look at course Web sites anew. Testing results can be illuminating for instructors and administrators, and it is imperative that administrators follow up with their instructors to clarify testing results, answer questions, and facilitate course revision.

One of the greatest practical challenges we faced on a programmatic level was that the eTC 219 courses varied rather substantially by instructor. To this end, some student-testers completed the Getting Started sequence quickly though others needed the entire time. We encourage our eTC instructors to customize their course sections to their own personalities, but this makes it difficult to get a sense of what a "standard" course might look like. We struggle (as do many other online writing programs) with walking the line between standardization and customization in course design. As is the case with the Rodrigo and Ramirez (2017) article in this special issue, we see the merit of offering master courses for online instructors to use; however, we still want instructors to have freedom of design. We use master courses as a model for instructor design, and it may be beneficial to ask instructors to participate in usability testing of the master courses and suggest feedback for revision, much as Rodrigo and Ramirez suggest. In general, the usability testing procedure has given us a more specific vocabulary for discussing design with our online writing instruction graduate practicum for the future.

Because usability testing in teacher training is a generative and reflective exercise, we caution against program administrators utilizing usability testing as a sort of teacher assessment. The work of usability

testing points toward the revision of online classroom design, and transparency is important. Administrators need to reassure instructors that online course development is a process, encouraging them to think of their course Web sites as works in progress from semester to semester. As new technologies become more widely available and easier to integrate into online course Web sites, administrators and instructors should continually think of how they can change and adapt them from class to class (or semester to semester) in an effort to enhance usability (see DePew, 2015, for more on the rhetoricity of course design). Some experiments in UCD, earnestly implemented as they may be, will fail and others will succeed. We believe that usability testing-as-evaluative teaching assessment falls short of fitting the exploratory, experimental, and collaborative spirit of usability research; therefore, we urge readers to consider the reflective qualities of this method for improvement to their teacher-training efforts.

Conclusion

The goal of this article was to give readers a clear picture of how to implement usability testing of online technical communication courses and then how to use the results for online teacher-training mechanisms at their own institutions. Within the professional field of TPC, usability testing is a ubiquitous tool for measuring how well or poorly a product serves a user's needs. The term *product* might seem crude when applied to an academic domain, where it means online courses in which students enroll, that instructors teach, and that program administrators observe and on which they reflect. Yet, the entity of the online course, like other "testable" devices and products, can itself speak volumes as a result of a user engaging with it; working to understand it; and navigating it in search of information, meaning, and additional tools and resources. Usability testing and user experience as means of measuring whether users (projected users or consumers of a product) can perform a task, extract information they need, or safely resolve a problem are key components within technical communication; thus, these means can be successfully used in academic settings such as the online teacher training we have described.

Our intention has been to establish a foundational logic for the incorporation of usability testing into teacher-training practices for online instruction within TPC programs. Clearly, as more students enroll in online courses, writing program administrators will need to expand teaching pools to accommodate this demand. Because not all instructors—in fact, very few instructors—have the unique combination of skills that would afford them expertise in workplace-applications of usability testing in a technical workplace and broad experience in designing course for online delivery via an LMS, program administration challenges are not insignificant. Administrators of TPC must doubly train and enculturate a diverse pool of technical writing instructors for online courses, which includes training them in online teaching practices and in the conventions and practices in the TPC workplaces in which many of them have never been employed. This latter point is significant, though, as it relates to what online TPC courses are aiming to provide for students. Through foundational courses in TPC, taught either face-to-face or online, educators are encouraging undergraduate students to consider TPC as an academic major or minor or, at the very least, to learn the genres and multimodal delivery practices that are now customary in the field, as well as standard technical communication practices such as usability testing. From our research into using usability testing as a mechanism for teacher training we found that the usability testing of online TPC courses can help to improve instructor training, leading to better, more effective course design, which can, in turn, promote distance students' success.

Notes

1. For more information about how the usability testing and user-centered design unit worked to develop these undergraduate students' understanding of technical communication, see Bartolotta, Newmark, and Bourelle (2017).
2. For those interested in overviews on usability testing basics and procedures, we recommend Barnum's (2011) *Usability Testing Essentials: Ready, Set … Test!* and Rubin and Chisnell's (2008) *Handbook of Usability Testing: How to Plan, Design and Conduct Effective Tests*. The U.S. Department of Health and Human Services sponsors the Web site http://www.usability.gov, which makes several resources for usability testing available to the general public.

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