Perspectives from a Departmental Adoption of an Open Technical Communication Textbook

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Abstract. In fall 2020, Kennesaw State University implemented an open educational resource (OER) as its required textbook across all sections of its TCOM 2010: Technical Writing course. Using results from a quantitative study of students and faculty using the *Open Technical Communication* textbook, this paper provides valuable perspectives on actual use of an OER in the technical communication survey course. Results of the study revealed both expected and unexpected insights that indicate topics for further research. From the faculty survey, there may be a positive effect of faculty involvement in the creation and adoption process on their perception of the OER, and the relationship between faculty perceptions of student engagement and students' actual academic achievement may not be a close one. From the student survey, students' actual use of OER is about as inconsistent as their use of traditional commercial textbooks, students' use of supplementary resources has a positive effect on their perception of the OER as long as they choose to use them, and students' interest in an OER and their perception of its quality do not appear to be related.

Keywords: open educational resources, programmatic adoption, faculty perspectives, student perspectives, technical communication, departmental adoption

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Introduction

As alternative course materials—such as inclusive access, textbook rentals, digital textbooks with and without companion websites, and resale textbooks—emerge and expand to combat high standard textbook prices, initiatives at the country, state, institution, department, and faculty level have emerged for creating and adopting open educational resources (OER) as a small piece to the affordable education movement. According to David Wiley (n.d.), OER are typically understood to be free course materials and textbooks that allow for five permissions which grant the user the ability to retain, reuse, revise, remix, and redistribute the work. In the United States, OER are usually created by instructional faculty in collaboration with instructional designers, librarians, and university presses. There are also a few open publishers in the United States, including OpenStax and The University of North Georgia Press, that conduct peer review on their open textbooks.

As part of a state-wide affordability program in the United States' State of Georgia, five faculty members at Kennesaw State University (KSU), located just northwest of Atlanta, developed an open textbook using new material and existing materials remixed with permission. The OER underwent multiple redesigns and content updates, shifted between software platforms, and was renamed since its initial publication, but it is now available in a stable, online version as *Open Technical Communication* (*OTC*) (Tijerina et al., 2019). As of this writing, *OTC* includes a complete textbook hosted on an interactive platform with annotation features, a plethora of ancillary resources and sample syllabi, and an at-cost print option for students who prefer a hard copy. Thanks to its zero cost and supplementary resource, *OTC* has been adopted by faculty in at least 23 states and at 42 institutions (that we know of), as well as a few adopters outside the United States.

The developers of *OTC* have used it since its launch in 2015, but in Fall 2020, KSU's Department of Technical Communication and Interactive Design implemented *OTC* as its required textbook across all sections of its introductory-level technical communication class, TCOM 2010: Technical Writing, which serves over 1,200 students per year. Students taking this class save approximately $200,000 annually in textbook costs at KSU alone. As part of a grant reporting requirement, the authors of this article (the developers of *OTC*) conducted surveys with faculty members and students after the departmental implementation in Fall 2020, seeking perspectives on and experiences with the open textbook. We have continued to survey the students of TCOM 2010 every semester to garner feedback for continuous improvement of the

course and the *OTC* textbook.

Background

Affordable Learning Georgia Textbook Transformation Grants

Since 2014, the University System of Georgia (USG) has supported Affordable Learning Georgia (ALG), a state-wide affordability initiative run through the state library system, GALILEO. Through its primary grant program, Affordable Materials Grants (formerly known as Textbook Transformation Grants), ALG has saved students over $105 million in textbook costs (2022). These grants provide state funding to support teams of faculty and staff across the USG to create, revise, and/or adopt OER for their courses.

The year prior to ALG's inception, KSU (a liberal-arts leaning regional comprehensive university) and Southern Polytechnic State University (SPSU, an engineering-focused university) had just completed a consolidation under the KSU name. As part of this consolidation, KSU's College of Humanities and Social Sciences gained a new department, now called Technical Communication and Interactive Design (TCID), which had formerly housed SPSU's English courses. Due to the technical nature of SPSU's Technical Communication majors and the differences between their needs and the coursework available from a traditional English department, the separation of KSU's English Department and the TCID Department stood firm. Even so, there are overlaps in the content of each department—particularly in the area of technical and professional communication. The English Department maintains a professional writing minor with corresponding courses, while the TCID Department maintains a technical communication major.

This partial overlap between the TCID and English departments at KSU positioned them in a strong position to pursue collaborative work. A group of faculty from each department teaching TCOM 2010: Technical Writing (TCID) and WRIT 3140: Workplace Writing (English) agreed that the commercial textbooks they were using were exceedingly and unnecessarily expensive for students, the most common one costing about $120 for a new copy. So, when ALG released its third round of Textbook Transformation Grants in 2015, this team of four faculty and one instructional designer applied as a group and received a $30,000 grant to develop a new, openly licensed textbook to satisfy the needs of both courses at zero cost to students. The authors of this article are two of the grant recipients and original authors of the resulting open textbook, now titled *Open Technical Communication* (*OTC*).

Open Textbook Development and Revision Cycles

With permission, the authors of *OTC* started with David McMurrey's

Online Technical Writing (n.d.), an older open online textbook, to develop a "remixed" open textbook, which is when OER developers combine and revise existing openly licensed works to create a new work, ideally with an open license itself. OTC was first published under its working title, *Sexy Technical Communication*, in 2016 with a Creative Commons Attribution 4.0 license (n.d.). That original publication is no longer available online, but Figure 1 gives an example of its "idiosyncratic" design.

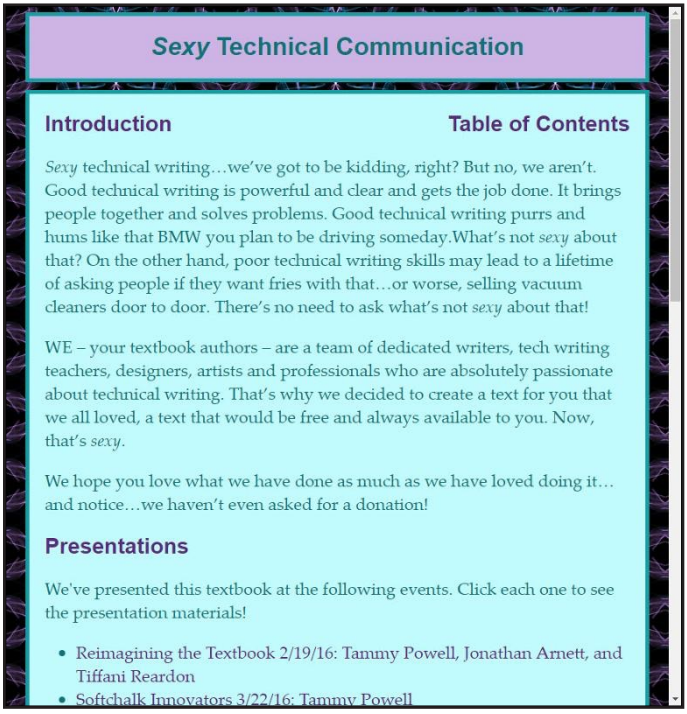

Figure 1: Sexy Technical Communication's original homepage (Tijerina, 2020).

This original version of the open textbook was what one might expect from technical communicators who were dipping their toes into OER development for the first time. The content was, overall, appropriate for an introductory course. The design, done by an undergraduate student, was as unique as the title, and the platform, SoftChalk, was the best and most convenient option available to the team at the time. The original version and its subsequent updates were published using a separate SoftChalk Cloud module for each individual chapter and chapter section (where applicable) and then connected via an HTML-

based table of contents. In 2018, two of the textbook authors received a Mini-Grant from ALG (now called Continuous Improvement Grants) for a set of improvements on the textbook. The next version replaced the original and included a new color scheme, design, and logo (depicted in Figure 2); better accessibility and document design; consistent chapter objectives; Google Analytics; and an optional at-cost print version. It maintained the *Sexy Technical Communication* title, but this second version is where the most recent SoftChalk version of *OTC* received its design. The second SoftChalk version of *OTC* was published a year later, in 2019, after receiving a few new chapters and its permanent, more professional title of *Open Technical Communication*.

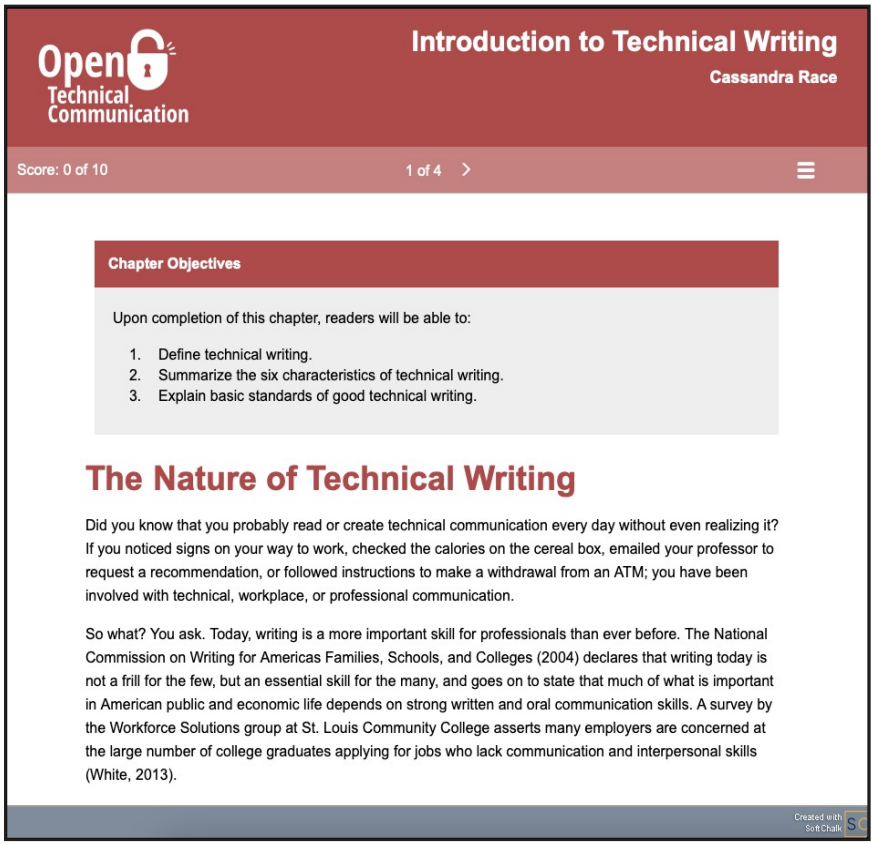

Figure 2: Chapter 1 of the second SoftChalk version of OTC (Race, 2019).

In 2020, *OTC* was migrated from SoftChalk to its current home, OpenALG—the University System of Georgia's instance of Manifold, an open publishing platform. The SoftChalk version stayed live for anyone using

it at the time (and remains so to this day), but it no longer receives updates. In the transition to OpenALG, the *OTC* textbook underwent significant design, usability, and accessibility improvements. The platform itself provides an easier path for accessibility, annotation features for users, and a more user-friendly interface. The current OpenALG version of *OTC*, depicted in Figure 3, receives regular updates and new resources.

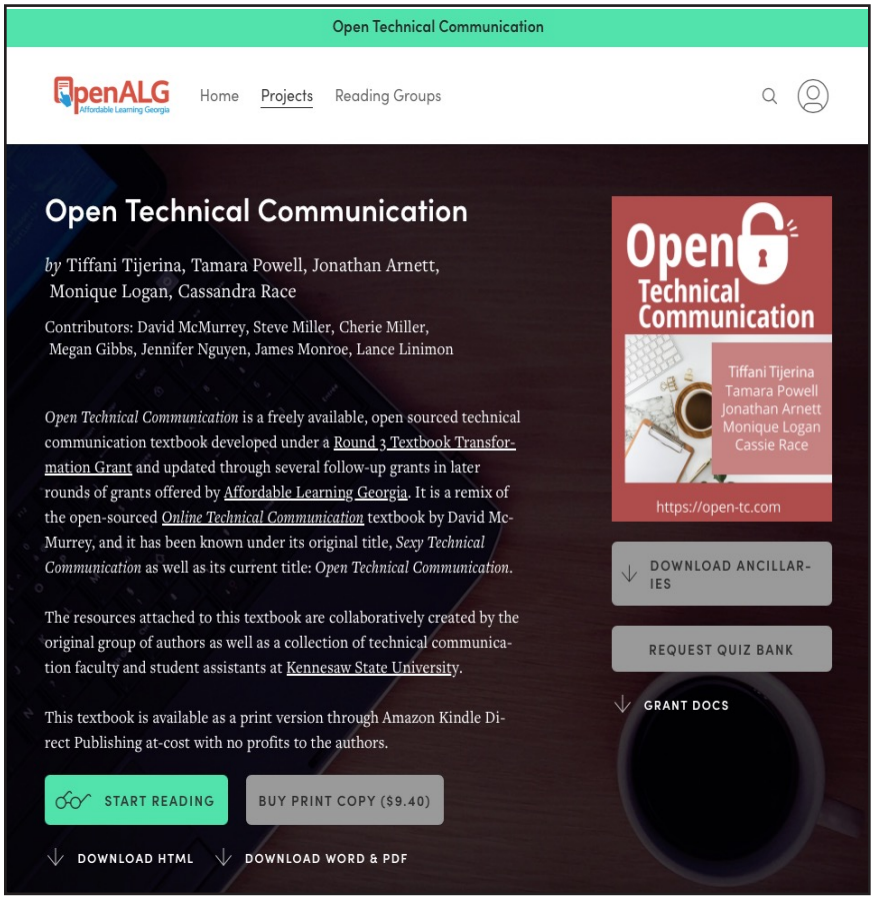

Figure 3: The homepage for Open Technical Communication's most recent version, available on OpenALG (Tijerina et al., 2019).

Department-Wide Open Textbook Adoption

After several years of TCID faculty members using *OTC* on a voluntary basis, the authors of this article applied for and received a second Textbook Transformation Grant from ALG in the amount of $25,800

with the specific purpose of "scaling up" the use of the *OTC* textbook to all sections of TCOM 2010: Technical Writing, a change that was implemented in Fall 2020. Prior to this formal adoption, slightly fewer than half the instructors were already using the second SoftChalk version of *OTC* in their courses, and the remaining instructors were using standard commercial textbooks of their choice.

Faculty were initially allowed to choose between the SoftChalk and OpenALG versions for the departmental adoption, and this study was conducted during that time. However, within a year of this study, all faculty were instructed to begin using the OpenALG version of *OTC* because it is the only version currently being maintained for accessibility, content, and usability. In addition, the TCOM 2010 course's curriculum had been inconsistent, so as part of the formal adoption process, the authors developed an online template course in KSU's learning management system as a resource to help instructors obtain the course materials they needed and to guarantee all sections meet departmental curriculum requirements.

As a way of encouraging department faculty to adopt *OTC*, the authors used some of the grant funding from ALG to offer a $1,000 stipend to faculty who were not authors of *OTC* but who contributed openly licensed ancillary materials for the current version of *OTC*. These faculty members developed materials for one identified course module, and they had the option of creating PowerPoint presentations, assignment and activity descriptions, and recorded lectures. These ancillary materials were then uploaded to the OpenALG version of *OTC* and deployed in the template course.

Literature Review

The existing literature on OER is interdisciplinary and expansive. In recent years, researchers have studied the relationship between OER use and student success (Hockings et al., 2012; Reardon, 2018; Colvard et al., 2018), student and faculty perceptions of OER (Benoit, 2018; Lin, 2019; Reardon, 2018; Illowsky et al., 2018; Vojtech & Grissett, 2017; Belikov & Bodily, 2016; Delimont et al., 2016), and other topics. OER are likely to garner more attention, and therefore more research, as the cost of higher education in the United States sees increased scrutiny.

Despite the plethora of research available on OER, however, there is very little available on OER in TPC specifically, and what little does exist comes from the same handful of researchers, with much of it looking at the same open textbook. Jonathan Arnett, Tamara Powell, and Laura Palmer (2016) detailed their experiences developing the OTC open textbook, which included many of the same logistical

challenges that collaborative projects consistently see, such as team organization and a divided authorial voice. Henry Covey, Jordana Bowen, and Sarah Read at Portland State University (2021) recently published a framework for future research into OER challenges in TPC with emphasis on five categories: awareness, choice, quality, efficacy, and use. Covey (2021) also published an in-depth analysis of the user experience of digital textbooks in TPC, using *OTC* as its case study OER. In the same article, he proposed a framework for assessing the UX of OER in general, including everything from user profiles to technology and design. After the initial publication of *OTC*, Arnett (2018) then went on to study the actual student use of *OTC* using Google Analytics data, where he concluded that student use of OER likely looks near the same as that of traditional commercial textbooks. This small collection of articles is all that exists on OER in TPC, but there is much to look at beyond the TPC field.

Student success is a key goal in OER adoption, but data on the impact of OER use through the lens of student success measures such as grade averages and drop/fail/withdrawal rates is often unclear due to both acknowledged and unacknowledged limitations. There are simply too many factors to consider that could affect students' success rates, although researchers have tried (e.g., Hockings et al., 2012; Reardon, 2018). The one study that seems to have provided reliable results, by Nicholas Colvard, Edward Watson, and Hyojin Park (2018), looked at the student success rates at the University of Georgia and compared courses using OER to courses using traditional copyrighted textbooks. After disaggregating their data, these authors found that there is a statistically significant correlation between student success rates among traditionally underserved groups of students and the use of OER. Specifically, the cost benefits of using OER positively influence success rates among Pell-eligible students, non-white students, and part-time students.

Multiple authors have investigated student perceptions of OER and identified factors that affect these perceptions, particularly the expectations students carry over from printed books (the typical format of traditional textbooks) to digital media (the typical format of OER). Andy Benoit (2018) found that "[s]tudents value familiarity, convenience, and ease of use when reading print…[and] students bring these criteria with them to their digital reading experience" (p. 13). It's a common complaint that the tactile experience of reading a physical book isn't present in most OER, but the effect of that complaint on overall perceptions varies. Hong Lin (2019) found that students place greater value on the "textbook cost savings, that [OER] materials are dynamic

and plentiful, that [OER] enable mobile learning, and that the use of [OER has information literacy benefits]." Similarly, student perceptions from affordability grant projects at Kennesaw State University showed that "while some students prefer to have a hard copy in front of them rather than a digital copy of materials, they still prefer free or low-cost digital options to expensive paper options--meaning that in general, students care more about cost than modality" (Reardon, 2018). However, despite Lin's (2019) findings that support digital OER, students also cited challenges with digital reading, including slow internet connections and a desire for the tactile experience.

Student perceptions of OER go beyond the modality and cost, of course. In the same previous study at KSU (Reardon, 2018), it was also found that "students care about the quality of their resources and that while they prefer free or low-cost options, they would rather pay for a textbook than sacrifice their success due to low-quality materials." Similarly, Barbara Illowsky, John Hilton, Justin Whiting, and Jordan Ackerman (2016) found that students view OER as equal to or better in quality than traditional copyrighted textbooks. However, it's also important to consider Arnett's (2018) findings that though we assume students respond to surveys about textbooks truthfully, in general, students don't actually use OER—or possibly any other—textbooks in any meaningful way. This lack of actual use is an important limitation of perception research, as it highlights a layer of unreliability in students' self-reported data.

Beyond research into student perceptions of OER themselves, Gabrielle Vojtech and Judy Grissett (2017) found interesting results on student perceptions of faculty who use OER in their courses. In a controlled study where students read two passages about a fictional faculty member in which the only difference in the passages was the textbook being used, students saw the faculty member using the open textbook as kinder, more encouraging, and more creative than the one using the traditional copyrighted textbook and expressed a preference to take courses from the faculty member using open texts. Comments from students indicated that the simple use of OER in place of copyrighted, high-cost textbooks is a sign to students that the faculty member not only cares more about the students and their financial situations, but also about their education, since OER can be customized to the needs of the course.

Existing research on faculty awareness and perceptions of OER is heavily weighted toward large-sample surveys of faculty as a collective rather than small-sample, targeted surveys of individual faculty going through the adoption process as with our study. Regardless, the

research does show some insight into the values faculty place in their perceptions of OER. In Angela Murphy's (2013) study, instructors indicated high levels of awareness and understanding of OER, and most also showed interest in adopting OER for their courses. More recently, Kerry Walton (2020) and Marjon Baas, Wilfried Admiraal, and Ellen van den Berg (2019) found that most faculty had either never heard of OER or knew very little.

Olga Belikov and Robert Bodily (2016) found barriers and incentives to faculty adoption of OER. On one hand, faculty felt that they needed more information and that the resources were not easily discovered; there was also a common confusion between OER and digital resources in general, a sentiment that was echoed in other studies (Baas et al., 2019; Fischer et al., 2020). However, they also found incentives in the student cost benefits, pedagogical benefits, and institutional support provided. The values of financial benefits and institutional support were echoed by other studies as well (Delimont et al., 2016; Reardon, 2018; Elf et al., 2015).

Methods

Research Questions

In this study, we aim to fill gaps in the research by answering the following questions:

1. What perceptions do faculty teaching TCOM 2010: Technical Writing at Kennesaw State University have of the *Open Technical Communication* textbook?
2. What experiences did faculty teaching TCOM 2010: Technical Writing at Kennesaw State University have when implementing the *Open Technical Communication* textbook in their courses as the required department-wide textbook?
3. What perceptions do students in TCOM 2010: Technical Writing at Kennesaw State University have of the *Open Technical Communication* textbook?

Data Collection

For this quantitative research study, we obtained approval from the institutional review board at KSU before conducting two anonymous surveys, one each on students (IRB-FY21-191) and faculty (IRB-FY21-192), with an understanding that further research may be needed, depending on the results of this study. In these surveys, distributed at the end of Fall 2020 and reproduced in Appendices A and B, we asked all students taking the introductory-level technical writing course, TCOM 2010: Technical Writing, and all faculty teaching it questions about their experiences with *OTC* as well as their percep-

tions of the online textbook itself. These surveys primarily used Likert scales, with some opportunities for respondents to elaborate on their answers. All free-response comments were reviewed from a qualitative perspective only, without data coding.

Study Participants

Participation in this study included several layered roles. The authors of this study are the only remaining original authors of the *OTC* textbook in the TCID department. They received the 2019-2020 Textbook Transformation Grant together, and they conducted the surveys initially as part of the requirements for the grant. Neither of the authors participated in the study as subjects completing the faculty survey.

TCID faculty (not including the authors) had the opportunity to participate in the study in two ways—completing the survey and creating the ancillary materials. Some participated in both capacities, and other participated only in one or the other. One faculty member in the department participated only as a compensated contributor to the ancillary materials for the open textbook; that faculty member does not teach TCOM 2010, and therefore was not invited to complete the faculty survey. In Fall 2020, there were 13 faculty members teaching TCOM 2010. All 13 were invited to complete the faculty survey, and all 13 were invited to contribute to the compensated ancillary materials for *OTC*. We do not know for sure how many of the faculty who completed the survey also participated in the creation of ancillary materials because the survey was anonymous. We do know that at least some of them did participate in both capacities. Finally, there may have been a few faculty members who participated in the survey but did not contribute to the compensated ancillary materials for *OTC*, but we do not know for sure how many, if any, did so.

Nine of the 13 faculty teaching TCOM 2010 responded to the faculty survey, eight of whom then went on to answer all questions. One outlier responded that they did not use the textbook in their class, so that respondent was removed from the data, leaving seven faculty participants. Faculty participants included Assistant Professors, Associate Professors, Professors, Lecturers, and Part-Time Instructors; and they taught TCOM 2010 in face-to-face, asynchronous online, synchronous online modalities, or some combination of these.

Despite asking all 13 instructors of TCOM 2010 to share the survey with their students, we experienced a very low response rate to the student survey. If we assume that, based on student responses that identified their instructors, only three instructors shared the survey with their classes, then we can also assume that 240 students received the survey from their instructors. Still, only 24 students in TCOM 2010

responded to the student survey. One student responded that they never accessed the textbook, so we removed that respondent from the data. Of the remaining students, all but two stated that they were enrolled in asynchronous online classes. It was the original intent of the study to include all modalities (asynchronous online, synchronous online, hybrid, and face-to-face) and compare amongst them. However, the number of respondents was low and their distribution across course modality was narrowly focused on asynchronous online courses. Because course modality can significantly impact perceptions of course materials, we also removed the two students in a face-to-face class from the data as outliers, creating an unintended focus on asynchronous online courses for the student data. With these three students removed from the data, the respondents consisted of 21 students enrolled in asynchronous online sections of TCOM 2010.

Limitations

Sample size is a clear limitation to this research for both the faculty and the student surveys. The Department of Technical Communication and Interactive Design at Kennesaw State University is a small department with a limited number of instructors, each teaching multiple sections of the TCOM 2010 course. Replication of this study at multiple institutions or in a larger department with a larger sample size of instructors would help to better understand the implementation of OER in the technical communication service course. In addition, the student survey would likely produce more reliable results if we shared the survey to students directly instead of placing the burden of survey solicitation on the instructors.

The COVID-19 pandemic created an additional, unexpected limitation of this research: Kennesaw State University does not usually offer remote (synchronous online) courses, but during Fall 2020, such courses were offered as a response to the pandemic. Two of the instructor participants in this study were teaching remote courses with an unknown level of preparation to teach in that modality. We do not know if either of these two instructors participated in the faculty survey, but none of their students participated.

Finally, because so few students from face-to-face courses and no students from remote courses completed the survey, the student perception research is limited to the asynchronous online course format. Replication with courses in multiple modalities would help shape a more well-rounded understanding of the student perception of OER use in the technical communication service course.

Results

Faculty Survey

Faculty were asked to predict their students' average grades (Question #2). Of the seven faculty respondents, two reported anticipating their students would earn an average grade of A, and five instructors reported anticipating an average grade of B.

Faculty were asked to identify the version of OTC they were using (Question #3) and whether they used the ancillary materials developed by their colleagues (Question #5). Two faculty members reported using the older SoftChalk version of the textbook, four reported using the newer OpenALG version, and two reported that they didn't know which one they were using. Two faculty members reported using the ancillary materials provided with the OpenALG version of the textbook, two reported not using the ancillary materials, and three reported that they didn't know if they were using them or not.

Faculty were asked questions about their feelings and perceptions of OTC before they began using it as the required textbook for TCOM 2010 (Questions #4, 6, and 7). Of the seven faculty respondents, five reported that they had already reviewed and implemented *OTC* in their courses before it was required of them. One faculty member reported that they had not reviewed it before, and one reported that they had reviewed it before and deemed it insufficient for their needs; they did not provide explanations of why. When asked how they felt when they were notified that *OTC* would be the required textbook for TCOM 2010, two instructors reported being extremely happy about the decision, three reported being somewhat happy, and two reported being neither happy nor unhappy. No instructors reported being unhappy with the decision. Four respondents provided comments on their answers:

- "I think it is an easier book to use"
- "Making students pay for textbooks is unethical, so having a free and accessible option is great"
- "Students have a hard time coming up with the money to buy expensive textbooks."
- "It's free and formatted in a way that's easy for our students to understand and read through."

Faculty were also asked two questions about their feelings and perceptions of *OTC* after it was adopted as the required textbook for TCOM 2010 (Questions #8 and 9). One faculty member reported being extremely happy with the open textbook after implementation, four reported being somewhat happy, and two reported being neither happy nor unhappy. No respondents reported being unhappy with the open textbook after implementation. Five respondents provided com-

ments on their answers:

- "It is an easy book to use"
- "Chapters need more details and more visuals. Many students no longer have context for events like the Challenger explosion, so more explanations would be helpful. The tone of the textbook can be negative and overly prescriptive."
- "Students like saving money."
- "I think that providing this resource is a big help to students."
- "I really like the book, I like the fact that it's free for students, and I appreciate the time and work that went into crafting it. That being said, I believe that there are some chapters that need updating and some content that could be added for students."

When asked about the contents of *OTC* (Questions #10, 11, and 12), three faculty members reported that the organization of the textbook complemented the course's organization extremely well, one reported very well, two reported moderately well, and one reported slightly well. Three faculty members reported that the contents of the textbook seemed complete, two reported that it lacks necessary information about the covered topics, and two reported that it is missing topics and it lacks necessary information about the covered topics. Four faculty members provided comments on their answers:

- "Overall, the book feels like it's been updated slowly over time. The chapters don't feel consistent with one another. It needs more visuals, more headings, and more bulleted lists."
- "No new topics but more on already covered topics."
- "It doesn't necessarily have a lot missing, it's just the order it's presented in could be different, and maybe it should contain different visuals or interactive elements, since it's inside of SoftChalk."
- "Some information regarding updated core topics to technical communication or even just more information on the field in general could be helpful."

Faculty were asked about their perceptions of students' engagement with the TCOM 2010 course (Question #13), their perceptions of students' engagement with *OTC* (Question #14), and their students' academic achievement in the course (Question #15).

Regarding student engagement with the TCOM 2010 course, five instructors reported perceiving that their students engaged equally with the TCOM 2010 course both before and after *OTC* was adopted. Two instructors reported perceiving a decrease in student engagement with the course after *OTC* was adopted.

Regarding students' perceived engagement with *OTC*, one faculty member reported that students engaged with the textbook more than in previous semesters, four reported that students engaged with the textbook about the same as in previous semesters, and two reported that students engaged with the textbook less than in previous semesters.

Regarding academic achievement, one faculty member reported that their students' academic achievement in the course was higher with the open textbook than in previous semesters, and six reported that it was about the same.

Faculty were also asked about how they accessed the *OTC* textbook (Questions #16, 17, and 18). One faculty member reported printing more than half of *OTC*, one reported printing about half of it, one reported printing less than half, and four reported not printing anything. Three faculty members reported saving/exporting parts of *OTC*, and four reported not saving/exporting any part of it. Of those who reported saving/exporting parts, one reported that they used Microsoft Word files, and two reported using PDF files.

Finally, faculty were asked to provide open feedback about the *OTC* textbook (Question #19):

- "Students like the online textbook but are often put off by the embedded activities within the textbook."
- "I appreciate your hard work, and how it has benefitted our students."
- "I have had students complain that the content of the book doesn't give them enough information to complete the assignments. I would lean more to say that they probably aren't reading it thoroughly. It might be helpful to add more interaction inside of the chapters to help reinforce concepts reviewed within the chapters, if you all are still planning to house it within SoftChalk."
- "This is an incredible resource and I appreciate all of the hard work that went into this. The students really seem to enjoy it (more than the fact that its free -- though that's a huge selling point), and the direction its moving towards in regards to textbooks in general is great."

Student Survey

Students were asked to predict their final grade in TCOM 2010 (Question #3). Of the 21 student respondents, 11 reported anticipating a final grade of A, eight reported anticipating a final grade of B, and two reported not knowing.

Students were asked about their ability to access *OTC* (Questions

#4 and 5). Twenty students reported accessing the open textbook without problems, and one reported that they had some issues but that they overcame them. No students provided qualitative comments.

Students were asked if they felt the *OTC* textbook's contents were complete (Questions #6 and 7). Sixteen students reported that the contents seemed complete, three reported that *OTC* lacks information about the covered topics, one reported that *OTC* was missing topics and lacked information about the covered topics, and one reported not knowing. One student elaborated on their response: "Additional examples and references of different document types."

Students were asked how much *OTC* helped them with their TCOM 2010 coursework (Questions #8, 9, 10, and 11). Of the 21 respondents, four reported reading chapters as assigned, ten reported using the open textbook to study before most or all the quizzes, and seven reported only using the textbook occasionally. Four students reported that the supplementary materials in the textbook were very helpful, eight reported that they were somewhat helpful, one reported that they were not helpful, seven reported not using the supplementary materials, and one reported not finding the supplementary materials. Students were then asked to rank the types of supplementary materials by helpfulness (Figure 4). On average, the quizzes were found to be most helpful, followed by the activities, then the videos, and then the sample documents.

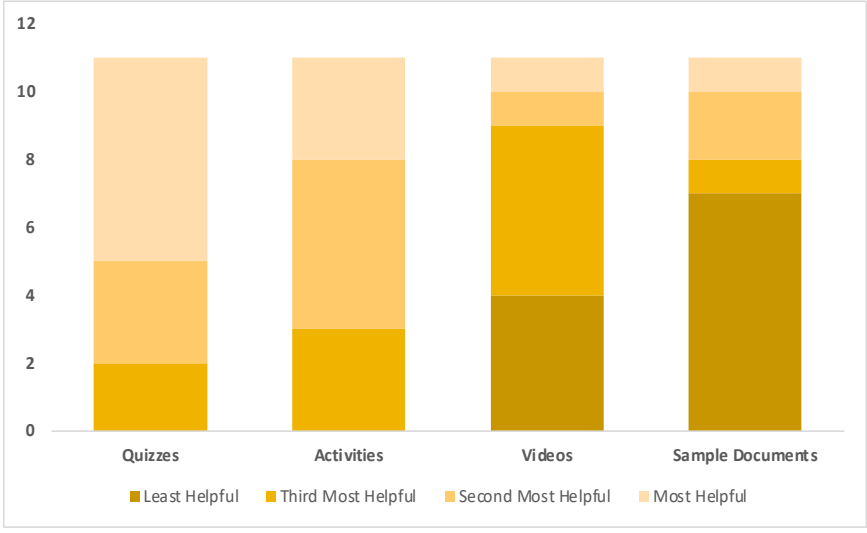

Figure 4: Helpfulness of Supplementary Resources in *OTC*

When asked to compare *OTC* to their textbooks in other classes

(Questions #13 and 14), six students reported that *OTC* was far more useful than other textbooks, five reported somewhat more useful, eight reported equally useful, and one reported somewhat less useful. Two students reported that *OTC* was much more interesting than other textbooks, eight reported more interesting, six reported equally interesting, and five reported less interesting. Four students reported that the textbook was far above average quality in comparison to other textbooks, seven said somewhat above average quality, eight said average quality, and two said somewhat below average quality.

Students were asked if they intended to use *OTC* after TCOM 2010 was over (Question #15). Four students reported that they intended to use the textbook beyond the technical writing class, eight reported possibly, five reported no, three reported that they don't know, and one did not respond.

Students were also asked about their feelings regarding the cost of the textbook and their modality preferences (Questions #16, 17, and 18). 19 students reported that they were extremely pleased with the $0 cost of the *OTC* textbook, and two reported that they were neutral about it. When asked whether cost affects their decision to buy textbooks for their classes, 10 students responded that they won't buy a textbook if it is too expensive, nine responded that they will try to find a used or rented option, and two responded that they always buy textbooks regardless of cost. Twelve students reported no preference for modality of textbooks, four reported that they prefer PDFs or Microsoft Word documents, one reported preferring e-books, two reported preferring printed textbooks, and two reported preferring interactive textbooks.

We asked students about how they accessed *OTC* (Questions #19–23). Nine students reported that they used the OpenALG version, five reported using the SoftChalk version, and seven reported that they didn't know which one they used. All 21 respondents reported that they did not print any of the textbook. Twenty students reported that they didn't save or export any parts of the textbook, and one reported that they saved parts as PDF files. Nineteen students reported that they never used a screen reader to listen to the textbook instead of reading, and two reported that they did use a screen reader occasionally.

Students were asked if they felt that the open textbook added value to their learning experience (Question #24). Seventeen students reported that it did add value to their learning experience, three reported that it had no impact on their learning experience, and one did not respond.

Finally, students were asked to provide qualitative feedback about any aspect of *OTC* (Question #25):

- "The class is good, but sometimes the quizzes can be impossible." ***Authors' Note:*** *We do not know if this response refers to the quizzes included in* OTC *or quizzes created independently by an instructor. We also do not know if this comment is referring to the quizzes' content or format.*
- "It's very interactive which forced me to learn and remember important terms; overall really useful compared to standard textbooks."
- "I believe this is one of the classes that you should be able to CLEP out of. Personally, I have been in the professional field for quite some time and the information in this course is very familiar to me. I understand that other student may not have the same experience as I do, so it may be of more benefit to them."
- "I liked the textbook. It was all relevant information, and I think the textbook industry is a racket and abusive. Thank you for providing a resource like this. I really enjoyed the links to example documents or pages that were relevant."
- "*Open Technical Communication* is a helpful book. I like that its free that really means a lot in a college course."
- "Extremely easy to use and access. Seemed well organized. Would have been an extremely useful tool if I this was my [first] time being exposed to many of these topics. I am not crazy about being unable to search the entire book for a term. Search seems to be limited to the page or chapter you are accessing at the current time. Plus it is free, which is a big deal for college students. All in all, an excellent product."
- "I love this textbook. I found the text engaging and fun to read."
- "I feel that the textbook is well-suited for this course."
- "I'm positive that I'll be using a lot of the information taught in class will benefit me throughout the life but a lot of the quizzes are irrelevant or unimportant, only the major assignments seem to help"

Discussion and Insights

In this section, we will briefly review key insights from the surveys and discuss implications to the use of *OTC* in introductory technical writing courses.

Faculty involvement in creation and/or adoption efforts might be a positive influence on faculty perceptions of open textbooks.

Faculty were asked how they felt when they first learned that *OTC* was to become the required textbook in all sections of TCOM 2010 and how they felt about the change after it was adopted. Faculty reported feeling neutral or better about switching to the textbook both before and after adoption. This result was surprising because in initial meetings about switching to *OTC* as the required text, several instructors showed signs of unease. In response, this article's authors wrote a grant that we used to compensate faculty members who developed ancillary materials for *OTC* and the TCOM 2010 course. Thus, the survey results showing neutral or better feelings on both sides of the project may be a sign that including the faculty in developing materials led to greater acceptance, or it may just be a maturation effect; faculty members may have come around to the idea over time.

That said, two faculty moved down a satisfaction level after *OTC* was adopted as the required text. One moved from "extremely happy" to "somewhat happy," and the other moved from "somewhat happy" to "neither happy nor unhappy." When asked for details on why they felt this way after implementation, the comments provided valuable suggestions for improvement, including the following:

1. We need to update the chapters with more details and more visuals.
2. We need to provide more context for examples like the Challenger explosion as our students become farther and farther away from the reference.
3. We need to work on tone consistency.

These faculty members did not explain why their ratings changed, but we hypothesize that as they became more familiar with *OTC* over time, the instructors began to notice issues that their initial examination of *OTC* did not reveal.

In contrast, though, one faculty member moved up a satisfaction level after implementation, citing that students like saving money—a common reason for faculty adopting open resources (Chtena, 2019; Jung et al., 2017; Nagashima & Hrach, 2021).

Faculty perceptions of student engagement may not always be consistent with academic achievement.

The faculty's reported experiences with using *OTC* were interesting and almost contradictory. On one hand, seven of the nine faculty respondents reported their perceptions that student engagement with the course was unchanged, and two faculty respondents reported their perceptions that student engagement was lower. Similarly, most faculty reported their perceptions that student engagement with the textbook itself was unchanged; one faculty member reported perceived

textbook engagement as higher, and two reported it as lower—the same two who reported lower perceived course engagement, which is noteworthy. However, despite the few reports of lower perceived student engagement, all faculty respondents reported unchanged or better expectations of their students' academic achievement.

Student use of open textbooks isn't consistent across the board, but it may not be all that different from their use of commercial textbooks, either.

Students were asked who their instructor was so that we could look for patterns in response based on individual instructors; however, no significant patterns existed for any question on the survey in relation to course instructor. Therefore, for the most part, we conclude that students completed the survey based on their perceptions of *OTC* itself rather than their perceptions of the course and/or instructor—which is what we wanted.

Students reported moderate use of *OTC*. Four students said that they always read the assigned readings, eleven said they used *OTC* to study before quizzes, and seven said they used it to study occasionally. Arnett (2018) conducted Google Analytics research on the original version of *OTC*, *Sexy Technical Communication*, to see how his students were using it, and he found that students did not use the OER in any meaningful way. As a group, the textbook authors have wondered if teaching style impacts that—for example, in lecture-heavy classes, do students read the readings the same way they would in a flipped-style class or across different modalities?

Supplementary resources can be useful to students who choose to use them, but not all students will make that choice.

When asked about the supplemental materials in the textbook, including those provided by the non-author faculty members in the department, more than a third of the student respondents said they didn't use the supplementary materials at all. However, of those who did, most said that they were at least somewhat, if not very, helpful. The students who indicated that the materials were helpful also ranked the materials. On average, the quizzes were ranked as most helpful, followed closely by the activities, then the videos, and then the sample documents.

Students don't have to be interested in a book for it to be useful or perceived as high quality.

On average, students rated *OTC* as no more or less interesting than their other textbooks, but students also rated *OTC*'s usefulness and quality as neutral or higher, suggesting that students are able to differentiate between their personal interest in a course text and in the

text's quality. Further research into students' ability to differentiate between their personal interest in a course and their interest in the course's text may prove illuminating.

Conclusion

This study was originally conducted as a reporting requirement for the Textbook Transformation Grant we received for the project, The insights noted in the Discussion section above apply specifically to *Open Technical Communication*, but they may also be applicable to commercial textbooks and other OER. Further research of this sort could prove to be invaluable in identifying and evaluating best practices for developing OER and leveraging them in teaching technical communication service courses.

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Appendix A: Faculty Survey Questions

1. Are you teaching TCOM 2010 in online, remote, or face-to-face modality during Fall 2020.
    a. Online format (You never hold an in-person class, and you do not hold a regularly scheduled online meeting.)
    b. Remote format (You never hold an in-person class, but you do hold a regularly scheduled online meeting.)
    c. Face-to-Face format (You hold in-person classes at least a few times during the semester.)
    d. I am teaching multiple sections in different modalities.
2. What do you anticipate your students' average grade to be in TCOM 2010, across all sections that you're currently teaching?
    a. A
    b. B
    c. C
    d. D
    e. F
    f. WF
    g. I
    h. I don't know
3. Which version of the *Open Technical Communication* textbook are you using?
    a. The version published on SoftChalk (off-white background, static Table of Contents page)
    b. The version published on OpenALG/Manifold (white background, drop-down Table of Contents)
    c. I don't know which version I'm using.
4. Before you learned of the requirement to use *Open Technical Communication* as the required textbook for TCOM 2010, had you ever reviewed the textbook and/or evaluated it as an option for TCOM 2010?
    a. No. I'd not reviewed it before the announcement.
    b. Yes. I'd reviewed it, and I'd determined that it was not sufficient/appropriate for my needs.
    c. Yes. I'd reviewed it and determined that it was sufficient/appropriate for my needs, but I hadn't tried it yet.
    d. Yes. I'd reviewed it and determined that it was sufficient/appropriate for my needs, and I'd already started using it.
5. Did you use the openly sourced ancillary materials developed by TCID faculty that are attached to the OpenALG version of *Open Technical Communication*?
    a. Yes

   b. No
   c. I don't know
6. Which of the following most closely describes your feelings when you heard that *Open Technical Communication* would be the required TCOM 2010 textbook?
   a. Extremely happy
   b. Somewhat happy
   c. Neither happy nor unhappy
   d. Somewhat unhappy
   e. Extremely unhappy
7. Please tell us why you felt that way.
8. Which of the following most closely describes your current feelings about using *Open Technical Communication* as the required TCOM 2010 textbook?
   a. Extremely happy
   b. Somewhat happy
   c. Neither happy nor unhappy
   d. Somewhat unhappy
   e. Extremely unhappy
9. Please tell us why you feel that way.
10. How well do you think the *Open Technical Communication* textbook's organization works with the TCOM 2010 course's organization?
    a. Extremely well
    b. Very well
    c. Moderately well
    d. Slightly well
    e. Not well at all
11. Do you think *Open Technical Communication* is missing topics or is lacks necessary information about the covered topics?
    a. Yes, it lacks necessary information about the covered topics.
    b. Yes, it's missing topics.
    c. Yes, it's missing topics, and it lacks necessary information about the covered topics.
    d. No, the contents seem complete.
    e. I don't know.
12. What new topics or missing information would you add to *Open Technical Communication*?
13. Think about your TCOM 2010 students' engagement with the course itself. Did you observe any difference between your students' engagement in classes that required *Open Technical Communication* and in classes that required another textbook? (If *Open*

Technical Communication is the only TCOM 2010 textbook you've used at KSU, include your experience teaching courses equivalent to TCOM 2010 at other institutions.)

a. Students who used *Open Technical Communication* seemed less engaged with TCOM 2010 than students who used another textbook.
b. Students who used *Open Technical Communication* seemed equally engaged with TCOM 2010 as students who used another textbook.
c. Students who used *Open Technical Communication* seemed more engaged with TCOM 2010 than students who used another textbook.
d. I don't know.

14. Think about your TCOM 2010 students' engagement with the *Open Technical Communication* textbook. Did you observe any difference between your students' engagement with the *Open Technical Communication* textbook and their engagement with the textbook you used previously? (If *Open Technical Communication* is the only TCOM 2010 textbook you've used at KSU, include your experience teaching courses equivalent to TCOM 2010 at other institutions.)
    a. Students seemed less engaged with *Open Technical Communication* than with the textbook I used previously.
    b. Students seemed equally engaged with *Open Technical Communication* and the textbook I used previously.
    c. Students seemed more engaged with *Open Technical Communication* than with the textbook I used previously.
    d. I don't know.
15. Think about your TCOM 2010 students' academic achievement. Did you observe any difference between your students' academic achievement in classes that required *Open Technical Communication* and in classes that required another textbook? (If Open Technical Communication is the only TCOM 2010 textbook you've used at KSU, include your experience teaching courses equivalent to TCOM 2010 at other institutions.)
    a. Students who used *Open Technical Communication* had lower levels of academic achievement than students who used another textbook.
    b. Students who used *Open Technical Communication* had equal levels of academic achievement as students who used another textbook.
    c. Students who used *Open Technical Communication* had higher levels of academic achievement than students who used an-

other textbook.
   d. I don't know.
16. Did you print any part of *Open Technical Communication*?
   a. No. I did not print any of it.
   b. Yes, I printed less than half of it.
   c. Yes, I printed about half of it.
   d. Yes, I printed out more than half of it.
   e. Yes, I printed the entire thing.
   f. I bought a print copy.
17. Did you save/export any part of *Open Technical Communication* to a different file format (e.g., PDF, HTML, MS Word)?
   a. Yes
   b. No
18. How much did you save/export, and what file format did you use?
   a. PDF
      i. I saved or exported parts of the textbook.
      ii. I saved or exported the entire textbook.
   b. HTML
      i. I saved or exported parts of the textbook.
      ii. I saved or exported the entire textbook.
   c. MS Word
      i. I saved or exported parts of the textbook.
      ii. I saved or exported the entire textbook.
   d. Other
      i. I saved or exported parts of the textbook.
      ii. I saved or exported the entire textbook.
19. We would love to have your feedback regarding *Open Technical Communication*. Think about the way it was organized, your experience integrating it into the course, its ease of access, helpfulness, usefulness, student response, and any other things you noticed. Please let the textbook authors know how you feel and share any ideas you have for improvement. Your input is greatly appreciated.

Appendix B: Student Survey Questions

1. Who is your instructor for TCOM 2010: Technical Writing for the Fall 2020 semester? (Names have been omitted for the purposes of publication).
2. Are you taking TCOM 2010 in online, remote, or face-to-face format during Fall 2020?
    a. Online format (You never attend an in-person class, and you do not attend a regularly scheduled online meeting.)
    b. Remote format (You never attend an in-person class, but you do attend a regularly scheduled online meeting.)
    c. Face-to-Face format (You attend an in-person class at least a few times during the semester.)
3. What do you anticipate your grade to be in TCOM 2010?
    a. A
    b. B
    c. C
    d. D
    e. F
    f. WF [withdrawal with academic penalty]
    g. I [incomplete]
    h. I don't know
4. An online textbook, *Open Technical Communication*, is required for TCOM 2010. Were you able to access the textbook?
    a. N/A -- I never tried to access the textbook.
    b. Yes. I accessed the textbook without problems.
    c. No. I never was able to find the textbook online, so I never used it.
    d. Sort of. I found the textbook online but never could open it, so I never used it.
    e. Sort of. I had troubles at first, but I eventually accessed the textbook and used it.
5. Please describe the problems you had with accessing *Open Technical Communication*.
6. Do you think *Open Technical Communication* is missing topics or is lacks necessary information about the covered topics?
    a. Yes, it lacks necessary information about the covered topics.
    b. Yes, it's missing topics.
    c. Yes, it's missing topics, and it lacks necessary information about the covered topics.
    d. No, the contents seem complete.
    e. I don't know.
7. What new topics or missing information would you add to *Open*

Technical Communication?

8. Does *Open Technical Communication* help you with your TCOM 2010 coursework?
    a. I occasionally use it to study before a quiz, just in case.
    b. I read the assigned chapters, and they deepen my understanding.
    c. I read the assigned chapters, but they don't add anything to the material taught in class.
    d. I use it to study before most or all of the quizzes.
9. Are the supplemental materials in *Open Technical Communication* (videos, quizzes, activities, sample documents) helpful in learning the course material?
    a. I did not find any supplemental materials in the textbook.
    b. I do not use/view the supplemental materials in the textbook.
    c. The supplemental materials are not helpful.
    d. The supplemental materials are somewhat helpful.
    e. The supplemental materials are very helpful.
10. You selected "The supplemental materials are somewhat helpful" or "The supplemental materials are very helpful." Please rank the types of supplemental materials (videos, quizzes, activities, sample documents) from most to least helpful.
    a. Videos
    b. Quizzes
    c. Activities
    d. Sample documents
11. You selected "The supplemental materials are not helpful." Please tell us why so we can improve them for future students.
12. Compare your level of interest in *Open Technical Communication* to other textbooks (not including non-textbook assigned readings) for your other classes. Do you find *Open Technical Communication* to be
    a. Much more interesting than average
    b. More interesting than average
    c. About average in terms of being interesting
    d. Less interesting than average
    e. Far less interesting than average
13. Compare the usefulness of *Open Technical Communication* to other textbooks (not including non-textbook assigned readings) for your other classes. *Open Technical Communication* is
    a. Far more useful than average
    b. Somewhat more useful than average
    c. Average in terms of being useful

   d. Somewhat less useful than average
   e. Far less useful than average
14. Compare the overall quality of *Open Technical Communication* to other textbooks (not including non-textbook assigned readings) for your other classes. *Open Technical Communication*'s overall quality is
   a. Far above average
   b. Somewhat above average
   c. Average
   d. Somewhat below average
   e. Far below average
15. Do you think you will use *Open Technical Communication* after TCOM 2010 is over?
   a. No. I will not access it again after the class ends.
   b. Possibly. I'll reference it if I take another class with similar writing assignments.
   c. Yes. I'll continue to access and reference it for future writing tasks in and out of college.
   d. I don't know
16. How does the $0 cost of *Open Technical Communication* make you feel about the textbook?
   a. Extremely pleased
   b. Somewhat pleased
   c. Neither pleased nor displeased
   d. Somewhat displeased
   e. Extremely displeased
17. In a class with a traditional textbook, how much does cost affect your decision on whether or not to buy the textbook?
   a. Not at all. I always buy textbooks without thinking much about cost.
   b. Somewhat. If I can find a used or rented option, I'll choose that over a new version.
   c. Very much. If a textbook is too expensive, I won't buy it.
18. Which type of textbook do you prefer, in general?
   a. Files that work on my tablet's e-Reader app.
   b. Interactive, online websites.
   c. PDF or MS Word documents.
   d. Printed, bound copies.
   e. Any kind. I don't care.
   f. I don't know.
19. Which version of *Open Technical Communication* do you use?
   a. The version with an off-white background and a static, web-

page-format Table of Contents. (This version has a SoftChalk logo.)
   b. The version with a white background and an active, drop-down Table of Contents. (This version has an OpenALG/Manifold logo.)
   c. I don't know.
20. Did you print any part of *Open Technical Communication*?
   a. No. I did not print any of it.
   b. Yes. I printed less than half.
   c. Yes, I printed about half of it.
   d. Yes. I printed out more than half of it.
   e. Yes, I printed the entire thing.
   f. I bought a print copy.
21. Did you save/export any part of *Open Technical Communication* to a different file format (e.g., PDF, HTML, MS Word)?
   a. Yes
   b. No
22. How much did you save/export, and what file format did you use?
   a. PDF
      i. I saved or exported parts of the textbook.
      ii. I saved or exported the entire textbook.
   b. HTML
      i. I saved or exported parts of the textbook.
      ii. I saved or exported the entire textbook.
   c. MS Word
      i. I saved or exported parts of the textbook.
      ii. I saved or exported the entire textbook.
   d. Other
      i. I saved or exported parts of the textbook.
      ii. I saved or exported the entire textbook.
23. Did you use a screen reader to listen to *Open Technical Communication* instead of reading it with your eyes?
   a. No, I never use a screen reader to listen to the textbook.
   b. Yes, I occasionally use a screen reader to listen to the textbook.
   c. Yes, I often use a screen reader to listen to the textbook.
   d. Yes, I always use a screen reader to listen to the textbook.
24. Thinking about *Open Technical Communication*, which of the following statements do you feel is most accurate about your experience?
   a. *Open Technical Communication* had no impact on my learning experience in TCOM 2010.
   b. *Open Technical Communication* added value to my learning

experience in TCOM 2010.

25. Your professor and the textbook authors would love to have your feedback regarding *Open Technical Communication*. Think about the way it was organized, the way it is integrated into the course, its ease of access, helpfulness, usefulness, price, and any other things you noticed. Please let us know how you feel and share any ideas you have for improvement. Your input is greatly appreciated.

Author Information

Tiffani Tijerina is a Limited-Term Instructor of Technical Communication at Kennesaw State University. She has a well-established presence in the open education community, including previous work with Affordable Learning Georgia and the Open Education Conference, in addition to managing the international award-winning *Open Technical Communication* textbook. Ms. Tijerina is also a PhD candidate in the Technical Communication and Rhetoric program at Texas Tech University, where she is conducting dissertation research on barriers to OER creation, adoption, and sustainability. Her other research interests include open pedagogy, instructional design, and social justice.

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