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Comparing Technologies for Online Writing Conferences: Effects of Medium on Conversation

by Joanna Wolfe and Jo Ann Griffin

About the Authors

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In its 2011 report, the CCCC Committee on Best Practice in Online Writing Instruction (OWI) states that it “takes no position on the oft-asked question of whether OWI *should be* used and practiced in postsecondary settings because it accepts the reality that currently OWI *is* used and practiced in such settings” (Hewett et al. 2). The committee claims that teachers and administrators, including those in writing centers, “typically are simply migrating traditional face-to-face writing pedagogies to the online setting—both fully online and hybrid. Theory and practice specific to OWI has yet to be fully developed” (7). Hewett’s recent book on OWI echoes these concerns, and she claims that without a theory of OWI, it is “disturbingly easy” to assume that face-to-face pedagogy is better than computer-mediated instruction (*Online* 32).

Certainly, writing center scholars have traditionally assumed that

OWI is inferior to face-to-face instruction. Breuch describes online writing conferences as “less than impressive” (29) and suggests “some may argue that online tutoring goes much against the idea of a writing center—the idea of Burkean Parlors, of ongoing conversation” (31). A respondent to Neaderhiser and Wolfe’s survey expressed similar reservations by quipping that “an online writing center isn’t really a writing center is it?” (72). Even while asserting the need for writing centers to invest in technology, Harris (“Making”) sees the lack of real-time interaction and phatic cues in online conferences as a deficiency, a concern echoed by Hobson and Castner. More specifically, scholars have worried that the limited opportunities for give-and-take interaction promote a fix-it mentality (Castner; Harris, “Using”) and that the absence of face-to-face cues can cause consultants to fall back on working with the text rather than the writer (Enders).

Part of this dissatisfaction with online conferencing may be that the majority of these conferences rely exclusively on text-based technologies that lack media richness. Neaderhiser and Wolfe report that over 90% of online writing center conferences take place through email with another 9.6% occurring through synchronous text-based chat. Fewer than 0.2% of online conferences reported by the 266 institutions responding to their survey took place using media-rich synchronous technologies, such as real-time audio or real-time screen sharing—technologies that Neaderhiser and Wolfe argue are much better poised than exclusively text-based tools to support the dialogic, collaborative interactions writing centers aspire to achieve (61, 69).

Despite the overwhelming use of email in OWI, some innovative methods for conducting writing conferences have recently been studied. Hewett (“Synchronous”) has examined the use of whiteboards combined with text-based chat in writing centers, finding that the interactions resulted in improvements to student writing quality, but only one or two substantive changes were discussed per session. Jones, Georghiades, and Gunson similarly found that students responded very positively to the use of screen capture digital video (which combines audio and screen capture videos) as a form of asynchronous instructor feedback on their work. Yergeau, Wozniak, and Vandenberg experimented with synchronous audio-visual technology that allowed student and tutor to use web

cameras to see streaming video of one another.

These studies, however, have rarely attempted to compare OWI directly with face-to-face interactions to see what is gained or lost in the virtual environment. Such comparisons are needed both to persuade skeptics of OWI to reconsider the medium's potential advantages and to begin developing theories and practices of OWI. By directly comparing face-to-face and OWI, we better position ourselves to see what practices we can directly migrate to new settings, which practices need to be modified or transformed, and what new practices we need to add to our collective pedagogical repertoire. Moreover, we believe that it is also important to compare different versions of OWI in order to develop clearer theories of how changes in the conferencing environment can affect the consultant-writer dynamics that occur there.

Our current study therefore directly compares face-to-face writing center consultations with two closely related variations of OWI. Although this study takes place in a busy, dynamic writing center, we try to make our comparisons as systematic as possible so we can better foreground some of the benefits and disadvantages of various conferencing environments. Our study uses qualitative, naturalistic data (transcripts of sessions, surveys) but analyzes them using quasi-experimental methods (expert ratings, patterns of responses) in order to highlight trends across the copious data we collected (over 500 transcript pages). Although we realize that some in the writing center community are skeptical of such methods, many others have been calling for systematic, empirical inquiry into writing center concerns (Bergmann qtd. in Jaschik; Jones; Hewett, "Synchronous"). Such inquiry both produces insights that may not be readily visible using other methods and can persuade administrators and others across the university of the need to invest more resources and support rigorous research into writing center pedagogy.

Conferencing Technologies: Choosing among Options

Our first question was which OWI environments to study. We concluded we were most interested in conferencing environments

that allow for rich, interactive conversations that approximate the give and take of face-to-face writing conferences. Although Hewett (*Online*) has made a case for the effectiveness of asynchronous OWI, we wanted to explore how easily available media-rich conferencing environments would compare to the face-to-face setting most writing center practitioners seem to privilege.

Research suggests that audio-based conferencing has many advantages over text-based commenting. Neuwirth et al. found reviewers recording audio comments were more likely to mitigate their comments and were perceived as more likeable than the same reviewers writing text comments. Ice, Curtis, Phillips, and Wells similarly found that asynchronous audio feedback was more effective than text-based feedback in conveying nuance and was associated with increased student involvement, content retention, and student satisfaction. Perhaps more striking, audio feedback was associated with the perception that the instructor cared about the student. Further support for these conclusions can be found in Oomen-Early and colleagues' research which concluded that using asynchronous audio communication in online classes enhances instructor presence, student engagement, student mastery of content, and student satisfaction. Likewise, in a pilot study of synchronous writing conferences, Brown, Cazan, and Griffin found users preferred audio-based conferencing over text chat and were able to accomplish more within the real-time audio environment. Finally, Bos et al. found groups using audio conferencing produced better solutions to complex problems than those using text chat—with audio groups performing nearly as well as those collaborating face-to-face.

In addition to audio communication, we felt that a shared workspace was essential to supporting synchronous OWI. Harris ("Using") notes that online writing conferences suffer when consultant and writer lack a shared space in which they can interact with and manipulate the writer's text. Researchers in human-computer interaction similarly believe a shared workspace significantly improves the efficiency of speech communication (Whittaker), particularly among co-authors (Cohen et al.).

Since we were interested in providing support for nonverbal communication, one might wonder why we did not use video-based

conferencing, such as Harris (“Using”) recommends. However, research in intense collaborations suggests video has no benefits over audio and, in some cases, may even have a detrimental effect on intense collaborations (Bradner and Mark; Heath and Luff). Video collaboration has proven disappointing partly because video captures many distracting movements and background information without communicating the entire environment in which these movements take place. As Whittaker summarizes, visual information about work objects (such as a shared desktop provides) is far more important than visual information about participants. Finally, Yergeau, Wozniak and Vandenberg have noted that video may give unnecessary or distracting class and status information about participants by allowing each other to see their homes or workspaces. For these reasons, we chose not to pursue video-based conferencing in the current study, although such environments may be useful in future research.

We assessed two different variations of our online space. In the first version, which we call WordShare, the student writer and consultant used the Adobe ConnectPro conferencing environment to communicate through an audio channel and share a common desktop, allowing them to access the same word processor, web browser, and other applications. With the shared desktop, both participants can manipulate the cursor and scrollbar and have access to all of the features normally available in Word, so both can modify the text, use the highlighter, or change text formatting. The shared desktop allowed participants to easily redirect conversation to different parts of the document by scrolling and using the cursor to point to the relevant sections. Similarly, when participants wanted to change parts of the document, the shared desktop allowed them to simply implement the changes in the shared word processor. Such support prevents participants from having to negotiate a shared perspective with lengthy phrases such as “on page 3, paragraph 2.”

Our second variation is the Tablet PC condition, which used the same set-up except that the consultant was given a Tablet PC instead of a regular desktop computer. A Tablet PC allows participants to use special ink annotation features in Microsoft Word or other software programs to write on digital documents directly with a pen, much as a reviewer or instructor might mark on a standard sheet of paper.

Such tools for marking and editing a document can support distinct authoring roles for writer and consultant—something that prior research suggests improves communication and coordination of the document-creation process (Lowry and Nunamaker). In particular, we hypothesized that giving the consultant a digital pen and the writer a keyboard might encourage the consultant to make teacherly digital ink markings that lay over the main document while investing the writer with primary authority to make direct changes to the primary text. In addition, the Tablet PC's digital ink annotations have the potential to recoup some of the gestures that prior research has shown coauthors and reviewers use to help direct attention and construct a shared sense of the document (Cohen et al.; Thompson; Wolfe). Since Tablet PC users often take advantage of digital ink to create markings that are roughly analogous to physical gestures (Anderson et al.), we hypothesized that Tablet PCs might help writers discussing a shared text to recoup some of the nonverbal communication lost in digital environments.

The study described below examined two variations on an audio and desktop-sharing conference environment: a set-up with normal workstation computers (WordShare) and a set-up in which consultants worked from Tablet PCs. We had four basic research questions:

- How does a best-case virtual conferencing environment (with synchronous audio and desktop sharing support) compare to face-to-face? Does the conferencing environment appear to affect the pedagogical quality of the conferences or the nature of consultant-writer interactions?
- How does the Tablet PC compare to the WordShare environment?
- What recommendations might this study yield for tutor training or technology set-up that could improve conferencing in virtual environments?
- How might this study lead to recommendations for a theory of online writing instruction, such as that called for by the CCCC Committee on Best Practice in Online Writing Instruction?

Methods

Eight writing center consultants were observed working with student writers in each of three conditions—face-to-face, standard WordShare conferencing environment, and Tablet PC environment—for a total of twenty-four sessions observed. Both consultants and students were inexperienced with discussing writing in a synchronous audio and desktop sharing environment. We analyzed transcripts of these sessions on a number of different scales in order to assess qualitative differences such as consultant control of the sessions or overall pedagogical quality of the sessions. In addition, surveys were collected to analyze the attitudes of writers and consultants towards each of the three conditions.

Study Site and Participants

This research took place at a Midwestern state-supported metropolitan research university that generally enrolls 20,000 students, 15,000 of whom are full- or part-time undergraduates. This university's writing center hires approximately twelve graduate students as consultants and holds over 2200 student consultations annually. There is a 50-minute limit on consultations.

Consultants: The eight writing center consultants (five female, three male) who participated were the first to respond to an open invitation to join the study. Seven of the eight consultants were native English speakers, and the one non-native participant functioned at an extremely high level of proficiency. All consultants were graduate students in English with at least two semesters of experience working in the writing center. Four had experience consulting via email and synchronous text-based chat but had not had opportunity to experience audio consultations. Consultants received \$100 compensation after participating in all three sessions.

Student Writers: Sixteen student writers (ten female, six male) participated in the study. Of the sixteen student writers, eight completed WordShare conferences while the other eight completed both Tablet PC and face-to-face sessions. We asked these eight participants to complete two sessions each because our original intent was to focus on fine-grained differences between the Tablet PC and

face-to-face environments (a focus that our results caused us to put aside in favor of other differences that arose). Student writers were recruited by first soliciting regular writing center clients and inviting them to participate in the study and then by inviting students who showed up at the door with papers. Ten of the student writers reported prior experience with face-to-face writing center consultations, and all were experienced with the World Wide Web, email, and word processing. Students received \$20 compensation after their session for participating in the study.

Procedures and Surveys

When student writers showed up at the writing center with electronic copies of their essays, they were invited to participate in the study. In order to keep the sessions as consistent as possible, we invited only students who had already completed drafts to participate. Those accepting the invitation then completed a pre-consultation survey consisting of thirteen questions about their prior writing center and online communication experiences (see Appendix A). Students were next paired up with a consultant and assigned to one of the three conditions: face-to-face, WordShare, or Tablet PC. We tried as much as possible to vary the order in which consultants were introduced to the two online environments; however, because of conditions beyond our control, five of the eight consultants (rather than the four of eight that would have been ideal) were exposed to the Tablet PC condition before the WordShare condition.

If the consultant/student pair was assigned to the face-to-face condition, they were instructed to proceed as they would ordinarily with the exception that their session was videotaped. For technology sessions, the consultant and writer were ushered into different rooms with computers hooked up to the university's high-speed Internet connection and loaded with the Adobe Acrobat ConnectPro software that we used as a conferencing environment. A researcher then opened the shared meeting space, introduced the writer's text into the meeting, and gave the participants a rudimentary demonstration of how to manipulate the tools available in either the WordShare or tablet condition. The researcher also stayed nearby to help the participants

if any technology problems arose during the session. All participants were videotaped, and Adobe Acrobat ConnectPro's meeting software recorded the screen and audio activity of participants in the online sessions. At the end of the online sessions, writers were emailed copies of the text the participants worked from, with all comments and revisions included.

Following each session, both consultants and student writers completed a post-consultation survey (see Appendix B) querying their perceptions of the consultation using a combination of thirteen Likert-scale and four open-ended questions.

Transcript Creation

The twenty-four consultations were transcribed using Transana 2.0 software. In order to keep our raters blind to the experimental condition and our analysis focused on the pedagogical work conducted during the session, we opted to eliminate turns concerned with manipulating the technology. Thus, turns dedicated to equipment set-up (adjusting volume or document view), manipulation of the technology (how to scroll, edit, etc.) or self-conscious discussion of participation in the study were eliminated.

Data Analysis

Conversational Control: Transcripts were first divided into turns and the number of consultant and writer turns was tallied. The researchers then coded each turn to identify which participant was "in control" of the exchange. We focused on control because writing center professionals strongly believe that students should maintain ownership over their writing (Black; Kreiser; Walker and Elias). Moreover, some have worried that online conferences, in particular, will encourage consultants to control and dominate the session (Castner; Harris "Using"), although Hewett ("Synchronous") believes that online instructors try hard not to co-opt student writing or to provide inappropriately directive advice (20). We were therefore curious as to whether we would see any evidence of the online environments affecting the dynamics of conversational control.

"Control" was determined by identifying which participant

directed the flow of the conversation in each turn. In identifying the controlling partner, the pertinent question is, Who is pushing the exchange forward? When a participant introduces a new topic into the conversation or asks a direct question that the other participant must answer, that participant is usually controlling the direction of the conversation. However, when a participant's turn consists solely of affirming his/her partner's utterances (e.g., saying "Yes, that's a good point" or simply "OK") or responding to a direct question, that person is usually following his/her partner's lead and thus is not in control of the conversation. Only successful attempts to shift control of the conversation were counted; attempts to redirect that were interrupted and/or ignored by the other participant were not counted as a shift in control. To assess the reliability of the coding, the two researchers independently coded 15% of the turns, obtaining an inter-rater reliability of $k = .73$ using Cohen's simple kappa, a level that represents good agreement above chance (Fleiss).²

Document Marking: As Hewett ("Online") has observed, in OWI, much of the learning takes place through textual interactions. Therefore, we were particularly interested in how the conferencing environment might affect who wrote on texts and what types of comments and markings they made. The markings made on documents provide clues about the type of learning that is occurring, and looking at who made these markings can suggest who is taking the initiative for this learning. To this end, we noted whenever document marking occurred, who did the marking, and the type of marking. Table 1 notes the four main marking types identified:

Function	Description	Examples
Editing	Turns spent editing or revising existing text. This includes fixing punctuation, figuring out how to spell a word, and dealing with formatting issues such as indenting, spacing, and font size.	Writer: uh [reading text] "with students" sounds funny. We'll take this out. [deleting text]

Generating	Turns spent generating substantive new text. For a turn to count as generating text, the writer must be working on a new sentence that did not exist in the original document brought to the session.	Consultant: Think about reparations too because you're going to go into a discussion about reparations. Writer: Mmm hmm [typing: "repay African-Americans of African descent for the injustices that we . . ."]
Focus	Turns spent marking sections of text for the purpose of drawing the other participant's attention to that particular section. Includes underlining, highlighting, and drawing arrows or lines to get the other participant to focus on the same section of text.	Consultant: OK, let's stop there [makes squiggle mark at the end of the relevant paragraph].
Notes	General text that the writer will use to implement future changes. Includes writing reminders to add content, outlining the structure of the paper, and highlighting or otherwise marking a sentence to remind the writer to come back and edit it later.	Consultant: OK, I'm bracketing everything that you need to move up to the previous paragraph [brackets 5 lines].

Table 1: Types of markings made on the shared documents

We also recorded places where a participant marked on a private (usually paper) copy of the text that could not be seen by the other participant. Such private markings can lead to disjointed views of the text the participants are collaborating on, a condition Whittaker argues can contribute to communication difficulties. Private markings occurred in the OWI sessions when writers, instead of engaging with the shared electronic version of the text, made notations or revisions on paper without announcing their actions. The two researchers independently coded 10% of the turns for the use of document markings, obtaining an inter-rater reliability of $k = .72$ using Cohen's simple kappa.

Holistic ratings: To assess the overall pedagogical effectiveness of the conferences, three writing center professionals from different institutions were recruited to read and evaluate the transcripts. Two of these raters were PhD students with a strong interest in writing center research. The third rater had recently completed her PhD in

Rhetoric and Composition and had previously served as an assistant director at a writing center. The three raters first read each transcript and labeled turns they would characterize as either “good” (productive for the writer) or “bad” (evidence of miscommunication or not communicating effectively). This activity both helped the researchers hone in on interesting sections of the sessions and ensured that raters read the entire transcripts with due attention. Next, the three raters each evaluated the quality of the conference using 5-point Likert scales to respond to criteria considered important to successful writing conferences, including

- Overall success of consultation
- Writer engagement in session
- Writer taking responsibility for his/her own learning
- Consultant guided by writer’s agenda
- Degree of comfort writer and consultant demonstrated with each other.

In situations where multiple judges are used, a common measure for reporting inter-rater reliability is Cronbach’s alpha coefficient. In this study, Cronbach’s alpha coefficients were above .75 for “Writer engagement in session” and “Writer taking responsibility for his/her own learning.” This represents substantial agreement above chance. Cronbach’s alpha coefficients were between .41-.58 for the other three measures, which represents moderate agreement above chance (Fleiss). In addition, raters used a 4-point scale to assess the frequency of various activities during the session, including “Fixing the writer’s paper,” “Attending to mechanics,” “Providing elaboration or explanation,” “Building rapport,” and “Providing praise or affirmation.” Cronbach’s alpha coefficients were between .62-.76 for these five measures.³

Surveys: Post-consultation surveys were analyzed for both writer and consultant attitudes towards the content of the sessions and to the conferencing environments.

Results

Quantity and Control

Table 2 shows face-to-face sessions averaged over 50% more turns per session than computer-mediated sessions, a marginally significant difference, $F(1,23) = 4.25, p < .06$. (Although we realize many in the writing center community will not recognize the specific statistical tests we have performed, we include this information because it has meaning outside this community. Novices to statistical analyses need only focus on the p value, the last number reported in the tests. The p value indicates the likelihood that a distribution is due to chance. Thus, the lower the p value, the more reliable the reported trends are believed to be. A p value of .01 indicates a 1% likelihood that results are due to random chance; a p value of .05 indicates a 5% likelihood of chance; a value of .10 indicates a 10% likelihood of chance. Values of less than .05 are considered statistically significant; those from .05-.10 are marginally significant. It is worth noting that a statistically significant finding does not automatically mean the researcher has interpreted the data correctly.)

Some of the difference between face-to-face and computer-mediated sessions in the number of turns is due to our decision to delete from the transcripts turns that dealt specifically with negotiating the conferencing environment (such as turns focused on figuring out how to work the controls). If the turns focused on wrangling with the technology are reinserted, the average turns per WordShare session rises to 327 and average turns per Tablet PC session rises to 393 turns. Since all sessions were capped at 50 minutes, these findings may suggest that some writing-focused instruction is lost in the computer-mediated sessions, particularly as participants struggle to adjust to unfamiliar technologies.

Table 2 also provides support for the concern that online conferencing environments may become consultant focused. Although the face-to-face and WordShare conditions exhibited equivalent rates of consultant control, the percentage of consultant controlled turns increased in the Tablet PC condition, $\chi^2(2) = 38.01, p < .0001$. Thus, the consultants initiated and controlled significantly more of the discourse in Tablet PC sessions than they did in either face-to-face or WordShare sessions.

Condition	Average turns (and standard deviation) per session	Consultant-controlled turns	Writer-controlled turns
Face-to-face	531 (305) †	66%	34%
WordShare	320 (147)	66%	34%
Tablet PC	368 (150)	73%*	27%

* $p < .0001$; † $p < .06$

Table 2: Participant control by turns

Document Marking on Shared Text

The conferencing environment also seemed to influence both who wrote on documents and the types of markings made. Figure 1 indicates that the total amount of writing on the shared document increased from 10.5% of all turns in the face-to-face environment to 12.1% and 14.2% of all turns in the WordShare and Tablet PC environments, respectively, $\chi^2(2) = 17.5, p < .001$. More strikingly, Figure 1 also shows writers marked on the text significantly more often in the WordShare condition than the other two conditions, while consultants marked on the text significantly more often in the Tablet PC condition, $\chi^2(2) = 172.2, p < .0001$.

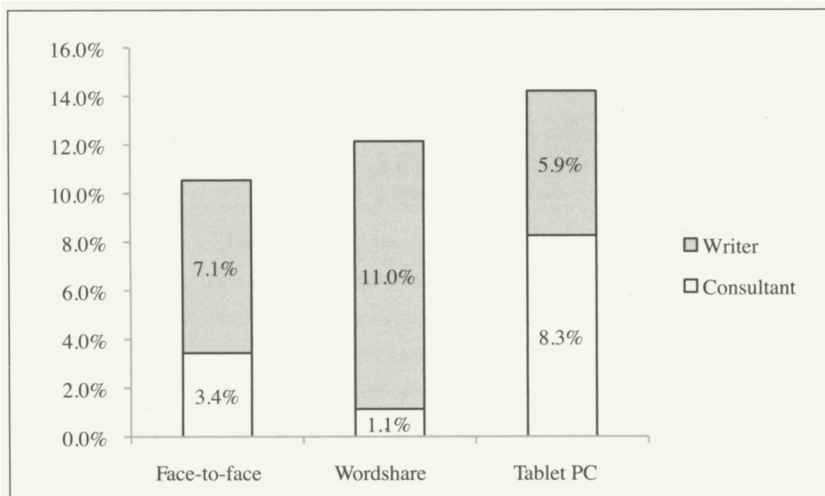


Figure 1: Percentage of turns in which participants marked on text

Table 3 provides additional insight into these trends. We can see from the third row of Table 3 that the increase in consultant markings in the Tablet PC condition can be attributed to consultants using the digital ink tools to establish joint attention in the Tablet PC setting. These markings replace the act of pointing in face-to-face conversations and help the remote participants establish a common frame of reference. Table 3 also shows us that note-taking decreased in both of the online conditions with writers taking almost no notes in the Tablet PC condition. Finally, Table 3 shows us that a striking amount of writer activity was spent generating new text in the WordShare condition. While new text was rarely generated in the face-to-face environment (mostly occurring when a consultant transcribed a writer's thoughts), text generation accounted for nearly 20% of the writing activity in the WordShare sessions.

Condition	Editing text	Taking notes	Generating text	Establishing attention
Consultants				
Face-to-face (n =140)	56%	38%	1%	1%
WordShare (n =27)	76%	10%	0%	7%
Tablet PC (n =242)	49%	22%	0%	29%
Writers				
Face-to-face (n =301)	87%	12%	0%	0%
WordShare (n =281)	70%	8%	20%	3%
Tablet PC (n =172)	95%	1%	2%	2%

Table 3: Types of document markings made by consultants and writers in the three consultation conditions (expressed as percentage of all document markings per condition)

Transcript 1 provides an example of a writer generating new text in a WordShare session while the consultant looks on and provides advice and encouragement. Such real-time text generation seems to be facilitated by the shared computer screen, both because the screen (as opposed to handwritten notes) helps consultants see exactly what is being written and because writers know that whatever additions they make can be saved. Even though it should be noted that the majority of new text generation in this study occurred in a single

WordShare session, such extensive generation of new text seems to be a unique feature of OWI.

Transcript 1: A writer generating text in a WordShare session

Consultant: [suggesting wording] “His idea makes sense, but I personally think that it would only work in a perfect society which does not and will not exist.” Then you get all these facts that show an example of how the society is not perfect.

Writer: OK. Um [typing “a perfect society”]

Consultant: Like the mere fact that you can have a Declaration of Independence that says all men are endowed and created equal but yet you have slavery.

Writer: Mmm Let me see. So “in relation to”

Consultant: So how, how could you make that

Writer: “has” um [typing “has strengthened the fact that”]

Consultant: Mmm hmm

Writer: [typing “there will never be”] Um

Consultant: Mmm hmm Yeah. you’re on the right track. That’s good.

Writer: Let me think for a second here.

Consultant: Mmm hmmm

Writer: [typing “a way to”]

Consultant: Yeah. You’re on the right track. You’re making a connection. Think about reparations too because you’re going to go into a discussion about reparations. How can you fit reparations in there?

Writer: Mmm hmm [typing “repay African-Americans of African descent for the injustices that we. . . .”] [intake of breath]

Consultant: Yeah. That's good. Keep going.

At the same time that OWI allowed for more extensive text generation during sessions, the environment seemed to discourage note-taking and writers almost completely stopped taking notes on the common document in the Tablet PC condition. Transcript 2 suggests that one reason for this decrease in writer activity may be confusion over how to use the electronic tools—particularly when the consultant had a different set of tools than the writer, as was the case in Tablet PC sessions:

Transcript 2: Writer asking consultant to write for him in Tablet PC session

Writer: Right. Right. So can I get control of [the Word document] back, or what?

Consultant: Um

Writer: Just to type that real quick? Or can you, can you write for me?

Consultant: I'm gonna go ahead. I'm trying to get this thing working um. Let's see. Black. I don't want to do red cause it's—yeah—Sorry about that. uh OK. . . . I'm gonna write down here at the bottom.

Finally, it is worth noting that in the electronic sessions the spell- and grammar-checker often became a distraction. Fixing spelling errors accounted for 5% of document markings in the Tablet PC condition and 3% in the WordShare condition, but only 1% of document markings in the face-to-face sessions. Many times the OWI conferences seemed to be temporarily derailed because of errors identified by Microsoft Word, a phenomenon Buck also reports. The writers and consultants spent time discussing and correcting these low-level and easily fixable errors when time might have been better spent on more substantive concerns.

Document Marking on Private Copies of Texts

The conferencing environment not only influenced the type and

quantity of document markings made on the shared text but also the extent to which participants (usually writers) marked individual, private copies of the text. Table 4 shows that writers in the Tablet PC setting made over twice as many markings on a private paper copy of their text as in the WordShare setting and seven times as many as in face-to-face. These private markings are an area of concern both because they might reflect writers' reluctance to engage with the computer controls and because having multiple versions of a text increases the opportunities for miscommunication (Whittaker; Heath and Luff).

Condition	Number of turns spent marking a private copy of the text
Face-to-face	4
WordShare	14
Tablet PC	28

Table 4: Number of turns writers spent marking on a private copy of the text

We see this potential for miscommunication in Transcript 3 when the writer justifies a long silence by explaining that he is taking notes. Had the participants been face-to-face or had the writer been making notes with the computer, the consultant would have been able to see this activity and no explanation would have been needed. Thus, writers' apparent reluctance to engage with the computer in the Tablet PC condition may result in less efficient communication.

Transcript 3: Writer marking a private paper copy of the text in a Tablet PC session

Consultant: And it wouldn't have to be too much more, just like a sentence. But just, I, I would, as a reader, I would be curious to see who directs this correctional officer, [follows "correctional officer" with cursor] and he is obviously carrying some kind of order out.

Writer: Yes sir. [making notes to self in paper copy of text]

Consultant: Well, how is he carrying that order out?

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Writer: And how is he carrying it out. [pause] I'm long-handing your notes. OK.

Consultant: Do you? OK.

Holistic Ratings

Holistically, there was little difference in how writing center professionals evaluated the quality of conferences across the three environments. Although Table 5 shows face-to-face sessions were generally ranked highest and Tablet PC sessions lowest on all measures, these differences were far from significant. In particular, evaluators perceived just as much writer engagement and agency in WordShare as face-to-face sessions.

Evaluation criteria	Face-to-face	WordShare	Tablet PC
Successful consultation	3.9 (.80)	3.7 (.50)	3.5 (.82)
Comfortable with one another	4.2 (.50)	4.0 (.79)	3.9 (.66)
Writer engaged	4.2 (.71)	4.2 (.67)	3.8 (.99)
Writer responsible for own learning	4.2 (.69)	4.0 (.84)	3.7 (1.00)
Consultant guided by writer's agenda	4.0 (.49)	4.0 (.67)	3.9 (.89)

Table 5: Average evaluations (and standard deviations) raters gave the sessions based on a 5-point scale (1 = strongly disagree; 5 = strongly agree)

While overall conference quality appeared consistent across all three environments, the consulting environment did appear to influence the types of pedagogical strategies consultants used. Table 6 shows consultants were perceived as doing marginally more fixing of writers' papers in the Tablet PC condition than in the other two media, $F(1,23) = 3.91, p < .07$. This finding is consistent with the increase in consultant control in Table 2.

Strategies observed in consultation	Face-to-face	WordShare	Tablet PC
Fixing the writer's paper	0.5 (.50)	0.6 (.42)	1.1 (.90)†
Attention to mechanics, syntax, grammar	1.6 (.60)	1.8 (.67)	2.1 (.50)
Providing elaboration or explanation	1.8 (.64)	1.5 (.40)	1.6 (.70)

Building rapport	1.8 (.62)*	1.3 (.47)	1.2 (.78)
Providing praise or affirmation	2.0 (.71)	1.9 (.53)	1.6 (.73)

* $p < .05$; † $p < .07$

Table 6: Average frequencies (and standard deviations) of strategies observed in consultations (0 = never; 1 = occasionally; 2 = often; 3 = very often)

Transcript 4 illustrates consultants’ tendencies to correct on writers’ behalf rather than allow them to implement changes themselves. The consultant in Transcript 4 corrects punctuation directly on the shared document with relatively little explanation. Meanwhile, the writer seems to have been turned into a passive observer of the consultant’s actions, a situation perhaps most tellingly encapsulated in the consultant’s query, “Are you keeping up with me?”

Transcript 4: Consultant fixing a writer’s text in a Tablet PC session

Consultant: OK, [reads] “five point star” [adds “nt” to end of word] “is,” uh, the [adds “the”] “struggle of the emancipation against,” um, maybe the, maybe the emancipation from [replaces “against” with “from”] “colonialism.” The, it would be “the struggle against colonialism,” or “emancipation from” it. “Struggle”. . . . So maybe, um, maybe “the struggle toward emancipation from colonialism?” [replaces “of the” with “toward”]. Does that work for you?

Writer: Um, yeah, yes.

Consultant: OK, so [reads] “The flag of Ghana”. . . . Let’s just go, let’s go back to this sentence up here. Are you keeping up with me, or am I going too fast?

By contrast, participants in WordShare sessions were more likely to hand off control back and forth to one another, as in Transcript 5.

Transcript 5: Consultant and writer sharing control in a WordShare session

Consultant: Right. What I would do—this is just a suggestion—I would start off with your discussion here [indicates

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location in text with cursor] where you're talking about exactly what [the speaker] was talking about. Then, I would put this stuff in where you're adding your extra commentary and your extra research [indicates location in text with cursor]. Flip it around. . . .

Writer: So this part right here would go up where "[The speaker] also discussed" [indicates location in text with cursor]

Consultant: Mmm hmmm Put it here [indicates location in text with cursor].

Writer: OK.

Consultant: I'll let you put that in there. You can just copy and paste.

Table 6 also indicates less rapport-building was observed in the two technology conditions than in face-to-face sessions, $F(1,23) = 4.37, p < .05$, although this finding may be due to the decision to eliminate turns explicitly focused on technology. In other words, there may be rapport-building not reflected in the transcripts as consultants and writers collaborated to manage the logistics of conducting the electronic sessions. No significant differences were found in the amount of elaboration or praise that raters perceived in the three conditions.

Surveys: Session Satisfaction

Table 7 suggests both consultants and writers were equivalently satisfied with consultations in the face-to-face and technology-mediated environments. All but one of the student writers agreed or strongly agreed that they were satisfied with the consultation. The one student writer (in a WordShare session) who responded "neither agree nor disagree" to the satisfaction question commented that at least some of her dissatisfaction was due to her perception that the consultant did not have a strong handle on "technical grammar rules." Consultants similarly were equally satisfied with the overall quality of technology and face-to-face consultations. The high levels of self-reported satisfaction immediately following the conference are typical for this writing center.

Satisfaction with consultation	Face-to-face	WordShare	Tablet PC
Consultant satisfaction	4.00 (.93)	4.13 (.35)	4.00 (.00)
Student writer satisfaction	5.00 (.00)	4.50 (.76)	4.86 (.50)

Table 7: Average agreement (and standard deviations) on a 5-point Likert scale with the statement “I was satisfied with this consultation” (5 = Strongly Agree; 1 = Strongly Disagree)

In their responses to other survey items, student writers were slightly more likely to agree that it was easier to communicate their concerns in the face-to-face environment (average agreement 5.0 on a 5-point Likert scale) than in WordShare (3.9) or Tablet PC (4.9) environments. The student writers also tended to agree that the Tablet PC (average agreement 4.3 on a 5-point Likert scale) and WordShare (3.8) environments were more impersonal than the face-to-face (3.1) environment. However, none of these differences is significant.

Surveys: Environment Preference

Student writers were far more enthusiastic about the online consultations than consultants. Table 8 shows that, while 75% of the consultants preferred face-to-face to online consultations, only 13% of student writers agreed. Instead, 87% of student writers who participated in an online session either preferred the online environment or had no environment preference.

Participant groups	Preferred online	No preference	Preferred face-to-face
Consultants after participating in an online session (n = 8)	13% (n = 1)	13% (n = 1)	75% (n = 6)
Student writers participating in an online consultation (n = 16)	56% (n = 9)	31% (n = 5)	13% (n = 2)

Table 8: Consultant and student writer preference for online vs. face-to-face consultations; only writers who participated in an online session are included

When students provided reasons for their preferences, they focused on the convenience of the online environment, commenting on the ease and travel time saved by working at home, factors that the CCCC Committee for Best Practice in Online Writing Instruction

similarly found students prized. However, students also mentioned pedagogical benefits such as “the ability to make changes on the spot.” Several participants explicitly contrasted the real-time application-sharing and audio support used in this study with text-based chat, saying “I really liked that we could both look at the screen at the same time. It was very helpful to be literally on the same page. I’m glad there was a mic instead of text messaging. That made it more personal.” Seven of the sixteen students in online sessions emphasized the importance of having a shared screen as contributing to their positive evaluations of the sessions.

Most of the student criticisms of the online environment focused on technological problems such as “echoing” in the headset, “lag time,” and “mushy controls.” One student also mentioned feeling he and the consultant had gotten into a “tug of war over the cursor.” In addition, nearly one-third of the students complained of a decrease in either the quantity or quality of communication in this environment. For instance, one student wrote, “I seemed to get more accomplished in an hour of face-to-face tutoring than in the online,” and “it was hard for me to express myself without confusion without being face-to-face.”

In contrast to the students’ overall enthusiasm for online consultations, consultants were much more negative about the online environments. Half of the consultants complained about inefficiency in the online sessions—a perception consistent with the finding that online sessions had fewer turns than face-to-face sessions. Consultants also found the absence of body language and facial cues made online communication more difficult. One consultant, for instance, wrote that “it is easier in a face-to-face tutorial to use body language as an instructional tool. For example I can use gestures, etc. to convey an idea.” Another consultant noted that online sessions seem to have a text-driven focus that make it difficult to “talk about more global concerns; it’s so easy to fall into an editing mode,” echoing concerns voiced by Enders, Castner, and Harris (“Using”).

Discussion

Because our research was conducted in a busy writing center, the

operations of which we wanted to disrupt as little as possible, many variables in this small study were beyond our control. Nonetheless, we do believe this study offers provisional evidence that media-rich online conferences can be nearly as pedagogically effective as face-to-face sessions. We found no significant differences in our expert raters' perceptions of the instructional quality of the sessions; moreover, participants were equally satisfied with the consultations regardless of environment. We did, however, note that environment seemed to affect how instruction was implemented. In particular, online environments saw a decrease in the number of notes participants took about planned changes to the text and an increase in the quantity of new text generated during the session. This shift from note-taking to actual text production has mixed benefits, and we suggest below some steps instructors may want to take to ensure that text production does not lead the sessions off track.

Our most surprising finding was that the Tablet PC variation of our conferencing environment exhibited some negative effects when compared with the other session types. The Tablet PC seemed to encourage consultants to assert more control over the sessions: consultants were more likely to dominate turn exchanges, were more likely to write *for* students, and were perceived as more likely to “fix” student papers rather than encourage students to implement changes themselves. So why did the Tablet PC seem to encourage consultants to exert greater control over the sessions? While we obviously do not have access to participants' mental states, we hypothesize that the unequal distribution of tools available to participants changed the dynamics of the sessions. Whereas in the WordShare sessions both participants manipulated the text and screen through the familiar mechanism of a computer keyboard, in the Tablet sessions consultants were given a relatively novel tool that was unavailable to writers. This inequality may have reinforced a perception that the consultant was in charge of the session—or at least in charge of the computer—and subsequently writers were more hesitant to engage with the technology. One consequence of this hesitance is that writers in the Tablet PC sessions turned instead to making notes on separate paper copies of their essays. Such personal note taking was not visible to consultants and contributed to a lack of shared awareness

of participants' activities during the session.

Support for our hypothesis that unequal tools contributed to consultant dominance of the Tablet PC sessions comes from one of the most highly rated conferences in our sample. This Tablet PC conference received a score of 4.7 (out of 5) for overall success, tying it with two other face-to-face consultations as most successful. Tellingly, both participants in this session mistakenly believed that the writer also had access to digital ink tools. At one point, the writer even picked up a ballpoint pen left near the computer and tried to use it on the desktop computer screen only to give up, saying "my marker sucks." Thus, this consultation may have been successful partly because the participants were under the impression that they both had access to the same novel technology. Future research is needed to determine if providing both student writers and consultants with Tablet PC tools would improve this condition.

One final result worth mentioning is the decided difference in student and consultant preferences for OWI. While over half of our student participants stated that they preferred OWI, only one consultant expressed a similar preference. Most consultants raised concerns about the pedagogical effectiveness of OWI—concerns our data suggests are mostly unwarranted. Although fewer turns may have been covered in OWI, our raters found these sessions pedagogically equivalent to face-to-face sessions. With a small amount of training, consultants could learn to overcome many of the obstacles we report (such as negotiating cursor control or becoming distracted by the spell- or grammar-checker). Hewett believes that instructors have too much "misguided" faith in the efficacy emerging from the comparative intimacy of face-to-face interactions (Online,13). Our findings lend some support to this assertion.

Several shortcomings in our study design may have affected results. The participants received minimal training in the technology and most were inexperienced with the virtual environments. Thus, we might expect to see some changes in both the quality and quantity of the online sessions as participants became more familiar with the possibilities and limitations of the online tools. It should also be emphasized that, while the participants (particularly the student writers) were very positive about the online conferences, they were

experiencing these environments in ideal conditions: the technology was set up for them on computers with very high connection speeds and a researcher was nearby to help them troubleshoot problems. More frustrations are to be expected if participants conduct conferences from their home computers. Our results are also affected by the fact that students in the Tablet PC sessions were more likely to have been regular writing center visitors than those in the WordShare sessions.

Finally, we must mention that this study was conducted in a naturalistic environment (a very busy university writing center), and we therefore were unable to control for the types of papers and the skill levels of the writers included in the study. Thus, we cannot dismiss the possibility that the differences between the Tablet PC and WordShare environments are due to differences in the participants. It is also the case that students were compensated for their participation in the study, which may have affected their satisfaction with the OWI and their tolerance for technological problems.

Recommendations for OWI and Directions for Future Research

Despite any problems with our study design, our experiences conducting this research do allow us to propose the following recommendations for setting up writing conferences in virtual environments:

- Real-time audio and desktop-sharing are highly desirable. Many participants particularly singled out these features as contributing to the success of the online conferences; we believe these features allowed the online conferences to approach the pedagogical quality of face-to-face sessions.
- Online conferences may warrant longer session times, particularly when participants are new to the technology. We found that online conferences averaged 30% fewer turns (once turns focused on technology were factored out) than face-to-face, and, not surprisingly, participants claimed that these sessions felt less efficient than face-to-face. Thus, longer session times may be needed to overcome some of the difficulties of

negotiating unfamiliar technology. Future research should examine how more experienced participants perform in online settings.

- Spell-check and grammar-check functions should be turned off to avoid the temptation to focus on these relatively low-level and straightforward errors during the conference time. Fixing spelling errors accounted for approximately 4% of the document markings in the online sessions but only 1% in the face-to-face sessions. Writers and consultants spent time discussing errors highlighted by the word processor, time that might have been better spent addressing other concerns.
- If the goal of the session is for writers to exert control and ownership over their own writing, then both participants may need to have equivalent tools. We hypothesize that one reason consultants dominated Tablet PC sessions is that they controlled tools unavailable to writers. More research is needed to test the hypothesis that unequal tools lead to unequal dynamics in other aspects of collaborative writing environments.
- Consultants and writers should receive training and advice on how to use tools to support distinct authoring roles. In Tablet PC settings, this could involve having the consultant use digital ink tools to draw attention to specific areas of the text and write notes in the margins while the writer uses the keyboard to change the text. In the WordShare condition, consultants might be coached to use the commenting feature and highlighting tools to comment on the text while the writer executes changes. More research is needed to examine how such training influences the quality of the conferences.

Writing center professionals are recognizing the importance of separating evidence-based research from lore. Although some lore suggests face time is the ideal form of communication, the findings from this small study give us reason to hope that, with training, experience, and the right selection of tools, OWI may offer pedagogical benefits rivaling—or even exceeding—those of face-to-face conferencing.

APPENDIX A: PRE-CONSULTATION SURVEY

1. Have you ever used the University Writing Center? Yes No
2. If yes, circle all that apply:
 - a. I met a consultant in the Writing Center
 - b. I submitted a paper for an email response
 - c. I met with a consultant through Blackboard
3. Your academic status:
Freshman Sophomore Junior Senior Graduate
4. Age: 17-25 26-30 Older than 30
5. Gender: Male Female
6. I use email as a communication tool:
Never An hour per week An hour per day 3-5 hours per day
More than 5 hours/day
7. I am connected to the World Wide Web (on the Internet):
Never An hour per week An hour per day 3-5 hours per day
More than 5 hours/day
8. I use an Instant Messaging Program:
Never An hour per week An hour per day 3-5 hours per day
More than 5 hours/day
9. What Instant Message applications are on your computer? (circle all that apply)
 - a. None/I have no clue
 - b. AOL Instant Messenger
 - c. MSN Messenger
 - d. Yahoo Messenger
 - e. ICQ
 - f. Other
10. I use Instant Messaging to (circle all that apply):
 - a. I never use Instant Messaging programs
 - b. Chat with friends
 - c. Work with someone on homework
 - d. Send a picture/file
 - e. Waste Time
11. How would you rate your overall computing experience compared to the average student?
 - a. Very below average
 - b. Somewhat below average
 - c. Average
 - d. Somewhat better than average
 - e. Much better than average
12. My previous face-to-face consultation(s) helped me improve my paper.
Strongly agree Agree Neutral Disagree Strongly disagree
13. I found all my concerns addressed in previous face-to-face consultations.
Strongly agree Agree Neutral Disagree Strongly disagree

APPENDIX B: POST-CONSULTATION SURVEY

1. I am a (circle one): Freshman Sophomore Junior Senior Graduate
2. I am a (circle one): Male Female
3. What is your major? _____
4. How many times have you visited the Writing Center in the past?

5. For what class is the assignment you discussed today?

6. How close are you to being finished with this assignment?

7. It was easy to convey my concerns about writing to the consultant:
Strongly agree Agree Neutral Disagree Strongly disagree
8. I know what I need to do in order to revise my paper:
Strongly agree Agree Neutral Disagree Strongly disagree
9. I found the consultant impersonal:
Strongly agree Agree Neutral Disagree Strongly disagree
10. My consultant addressed my all my concerns about my paper:
Strongly agree Agree Neutral Disagree Strongly disagree
11. Based on my experience today I would choose an online tutorial over a face-to-face tutorial in the future:
Strongly agree Agree Neutral Disagree Strongly disagree
12. Why would you make this choice?
13. I am satisfied with this consultation:
Strongly agree Agree Neutral Disagree Strongly disagree
14. What was the best or worst feature about today's consultation?
15. What would you like to be able to do in a consultation that you could not do?
16. Additional comments?

NOTES

1. We used Adobe ConnectPro as our conferencing environment due to its ability record conferences in addition to allowing participants to share a desktop and communicate via audio. Many other conferencing environments exist, including WebEx and Yuuguu (a free application).
2. Inter-rater reliability is a key concept in conducting ethical empirical research. It indicates that two or more individuals observe the same phenomenon independently from one another. Cohen's kappa and Cronbach's alpha are statistics that determine these observations are not due to random chance. The higher the statistics are, the more similar the raters' observations. A statistic of .75 or greater typically indicates excellent agreement; statistics greater than .40 represent fair agreement (Fleiss).
3. Four other criteria have been dropped from the evaluations because of low inter-rater reliability. These low levels of agreement are not surprising: it has long been recognized that the more complex and fluid the subject area being assessed, the more difficult it is to achieve high levels of inter-rater agreement (Coffman; Diederich). Writing center transcripts are certainly a fluid subject matter and there is a great deal of debate in writing center communities about the relative merits of particular strategies.

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