

Improving Student Engagement in Online Learning: A Study on Interactive Multimedia Tools in

Higher Education

ITC Journal Editorial

by

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About the Author

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Abstract

This study examined the effect of instructor-generated multimedia on student engagement in six sections of one online graduate course. This study observed the use of VoiceThread and Collaborate Ultra. The pre-developed online course template assignments were modified to use the tool/s specified. The students were administered a confidential survey in their section and the instructor was interviewed at the end of the term. The protocol for each was developed by the researcher to determine student engagement in connection to the Community of Inquiry model. This model states that a complete educational experience is developed through social, teaching, and cognitive presence (Garrison, Anderson & Archer, 2000).

The use of the tools proved to have a positive impact on student engagement, social presence, teaching presence, and cognitive presence. This study was done to highlight the importance of incorporating instructor-generated multimedia into course content in order to increase student-to-instructor, student-to-student, and student-to-content interaction and engagement. Online learning is growing , therefore, understanding what engages these students is necessary in order to improve knowledge retention and development.

Improving Student Engagement in Online Learning: A Study on Interactive Multimedia Tools in Higher Education

Online courses are growing and are here to stay. That is why it is imperative we learn how to do them well. One of the primary components of effective online teaching, not unlike traditional instruction, is student engagement. We need to learn what engages students in order to offer effective online learning environments. An increasing need for connection, involvement, and interaction is needed as students progress in their education.

The unique dynamics, interactions, and engagement that take place in a standard classroom environment are challenging to recreate. This challenge includes not only standard student-to-student interaction but also student-to-instructor interaction. Both modes of interaction promote student engagement. These modes of interaction in addition to the age-old student-content interaction work in an overlapping, interdependent method to help students gain deep levels of community to support their individual learning (Szeto, 2015) By purposefully designing activities, both synchronously and asynchronously, online courses can include these aspects of cognitive, social, and teaching presence. A combination of synchronous and asynchronous methods can support collaboration and methods to get to know each other in a social aspect.

The use of web conferencing multimedia tools, such as Collaborate Ultra, allows for synchronous interaction. This increases the real-time interaction for learning and meeting between instructor-student and/or student-student modalities. The use of asynchronous multimedia communication tools, such as VoiceThread, also allows for instructor-student and/or student-student interaction at their convenience, rather than in real-time. This allows for interaction with students that are outside the instructor's time zone. It also allows collaboration to occur with students that lead a busy life or work full time. Instructor-generated multimedia

tools including Collaborate Ultra and VoiceThread create discussion and interaction that is missing from traditional online courses. These instructor-generated multimedia tools can be impactful in increasing student engagement.

Review of Related Literature

The role of multimedia

A range of basic learning principles support the inclusion of multimedia. The multimedia principle finds that students learn better from words and pictures than from words alone (Doolittle, 2001). The generative theory of multimedia presented by Mayer (1997) supports the benefits of multimedia use in learning. Mayer's generative theory of multimedia learning accounts for meaningful learning, where learners integrate verbal and visual information presented with multimedia during the learning process (MacKenzie, 2013). Mayer (1997) conducted a series of studies using the generative theory of multimedia. These studies had predictions involving (1) whether or not the multimedia instruction is effective, (2) when the multimedia instruction is effective and, (3) for whom multimedia instruction is effective. The personalization principle uses a conversational tone and/or a personalized learning agent to enhance learning via social conventions to listen and respond meaningfully. Extending the implications of the personalization principle, it is possible that online courses that utilize multimedia to create a more personalized, intimate learning experience may increase student engagement (Mandernach, 2009).

The Use of Instructor-Generated Multimedia Content

One area that multimedia content can have an influential role in is developing instructor presence. Instructor presence in virtual learning environments is an influential factor in the

overall student online experience (Draus, Curran & Trempus, 2014). The use of multimedia in a study conducted by Borup et. al (2014), concluded that instructor-generated video content increased instructor presence. The students perceived that it was enhanced by increased emotional response, conversational tone, and overall connection. The findings indicated that students reported that the multimedia helped them to view their professor in a personal manner.

The community of inquiry

The model of the community of inquiry (COI), as presented by Garrison, Anderson, and Archer (2000), assumes learning occurs within the community through the interaction of three core elements. According to Shea and Bidjerano (2009), the COI framework provides a basis for how learning occurs in online environments. This theory states that instructor presence in an online course contains cognitive, social, and teaching aspects that are distinct and measurable (Draus et al., 2014). A sense of community can be difficult to create in a virtual environment of online learning. These three essential elements of cognitive presence, social presence, and teaching presence are extremely important in understanding how student engagement is facilitated and assessed in an online learning environment.

Student Engagement

Student engagement refers to the degree of attention, curiosity, interest, optimism, and passion that students show when they are learning or being taught, which extends to the level of motivation they have to learn and progress in their education (Student Engagement, 2014). McGilvery (2016) concluded that “interaction through the use of communication technologies is vital to a quality online education because it allows teachers to promote active online learners” (p. 1). Griffiths’s (2010) analysis suggested that using both instructor-generated content can enhance the learning experience and overall engagement in students. Draus et al. (2014)

concluded that instructor-generated content can have a positive and moderate influence on student satisfaction and engagement in online courses, however, the full impact of how it can influence students overall experience should be studied in greater depth. Students' level of engagement during both synchronous and asynchronous communication is challenged because they are not physically present in the same space.

Context of the Study

The purpose of the study was to evaluate the effect of instructor-generated multimedia on student engagement in online graduate courses. The qualitative case study methodology was used as well as the quantitative approach of causal-comparative research. The study included 108 students who were enrolled in the selected online, masters-level business course. In this case, students were selected based on their enrollment in the business course during the Fall 2018 academic semester. The course ran three times during Block I term and three times during Block II term in Fall 2018. A block is defined as a seven-week cycle. The course was taught by five instructors, each teaching one section, except for one faculty member that taught in both Block 1 and Block 2. The type of instructor-generated multimedia was then controlled in each section. The courses were re-designed to incorporate the tools into the pre-existing course templates by altering the assignments. The instructors were given thorough training by the educational technology department at the university on the use of these tools.

A total of six course sections ran in Block I and II for seven weeks with the following model:

- One with VoiceThread only
- One with Collaborate Ultra only
- One with both VoiceThread and Collaborate Ultra

After the course was completed, the student participants were assigned a survey about the use of the selected tool/s and their student engagement in the course. In addition, the instructors were interviewed on their view of the tool and how they believe it affected student engagement in the course.

Methods

Student Survey

The main instrumentation used in this study was a survey to determine the level of student engagement in each section. Student engagement was assessed on three different levels: cognitive, behavioral, and emotional. Cognitive engagement is defined as a student's investment in learning. Behavioral engagement draws on the idea of participation and is considered crucial for achieving positive academic outcomes (Christenson, Reschly, & Wylie, 2012). Emotional engagement focuses on the extent of positive and negative reactions to teachers, classmates, academics, and school.

Each of these three characteristics could be linked to the model of the community of inquiry (COI). This will associate the three essential elements of cognitive presence, social presence, and teaching presence to the three levels of student engagement. It was the purpose of this study to use instrumentation that captures a complete assessment of cognitive, behavioral, and emotional facets of student engagement. A measurement of all three levels was taken with the use of one survey.

Instructor interview

This study also used an interview process to get the instructors' point-of-view on the use of the selected instructor-generated multimedia tool/s and student engagement. This was a structured interview with predesignated questions. In addition, this posed as an observation

method for the study. This observation was an insight into the behavioral level of student engagement. The interview protocol was self-designed to cover the elements of cognitive presence, social presence, and, teaching presence.

Results

This section contains results of the study conducted to answer the research questions:

RQ1: What is the impact of the use of instructor-generated multimedia on student engagement in an online graduate course?

RQ2: What is the difference in student engagement between the uses of asynchronous or synchronous instructor-generated multimedia?

Two multimedia tools were used to enhance assignments in the online course templates; VoiceThread and Collaborate Ultra. VoiceThread is an asynchronous tool while Collaborate Ultra is a synchronous web conferencing tool. The existing course template consisted of reading assignments, text-based discussion boards, written blogs, online quizzes, written papers, and a final PowerPoint presentation with an audio voiceover. The revised assignments with VoiceThread included audio and video discussion boards and interactive presentations for the final presentation. The revised assignments with Collaborate Ultra included a synchronous discussion session, a synchronous group project, and synchronous presentations for the final assignment. The sections that used both VoiceThread and Collaborate Ultra used a combination of the above assignments with each tool.

The results of the study are segmented into student and instructor respondent data. The student data was divided and analyzed by multimedia tool (VoiceThread, Collaborate Ultra). The student data was primarily quantitative; however, an open-ended question in the survey enabled some qualitative analysis. Student participants responded to a series of questions

to determine how they used the tool, frequency of tool usage, and their perceptions of engagement. Their perception on student engagement was reported on a one to four-point Likert scale when considering their connection to the faculty member (teaching presence), connection to their classmates (social presence), and connection to the course content (cognitive presence) due to the multimedia tool usage in the course. The open-ended question asked the student respondents for any additional comments on the use of the multimedia tool in their course.

The instructor data was all qualitative. This data was collected during a brief interview conducted with each instructor. The instructors responded to a pre-determined series of questions to examine how they used the tool, frequency of tool usage, and their perceptions of student engagement and social, teaching, and cognitive presence.

Student Data

Overview. Sixty-nine students responded to the surveys administered in the six sections of the course. There were 108 students enrolled across six sections resulting in a 63.9% response rate. Figure 1 shows that the majority of the student respondents were of a non-traditional age; 55% of the respondents were 33 years of age and above. A 77% majority of the students had previously taken an online course, as depicted in Figure 2.

Age of Student Respondents

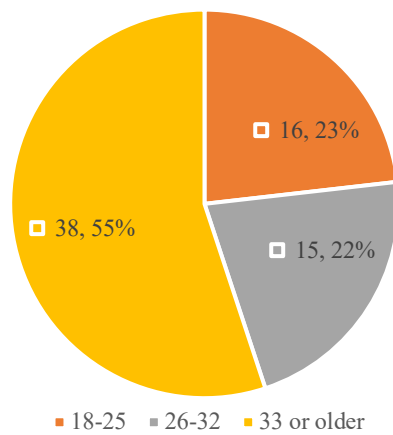


Figure 1. Age of student respondents

Taken an Online Course in the Past

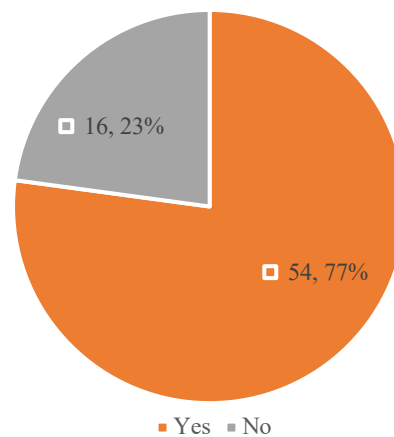


Figure 2. Percentage of respondents that took a previous online course

Quantitative Analysis by Tool.

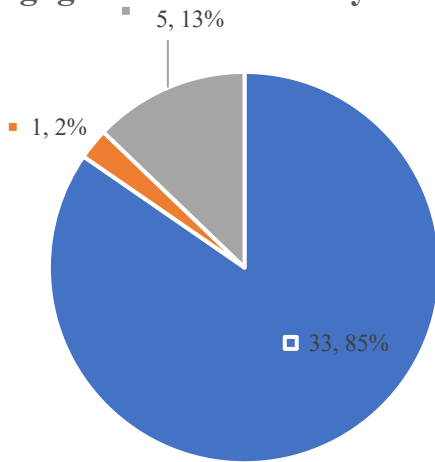
Collaborate Ultra. Forty-eight student respondents (69.5%) reported that they used Collaborate Ultra in their course. The majority of respondents (89%) have not used the tool in the past this. The respondents stated that they used the tool for a variety of assignments and the majority of them participated by using both audio and video. The majority (98%) also communicated with both their classmates and their instructors using the tool.

- 11 (22.9%) of respondents used the tool for a synchronous lecture
- 32 (66.7%) of respondents used the tool for office hours
- 32 (66.7%) of respondents used the tool for a study group
- 47 (97.9%) of respondents used the tool for a presentation

The majority (85%) of the respondents stated (Figure 3) that Collaborate Ultra allowed them to engage with the faculty member more than normal in an online course. The majority (79%) of the respondents stated (Figure 4) that Collaborate Ultra allowed them to engage with their

classmates more than normal in an online course. This data only included the respondents who stated that they have taken an online course in the past, since they were asked for a comparison to other online courses.

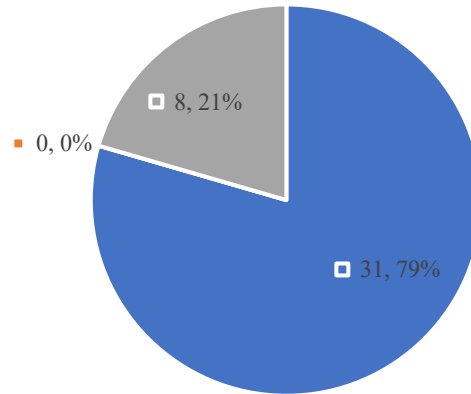
Collaborate Ultra Allowed Me To Engage With the Faculty Member



■ More Than Normal ■ Less Than Normal ■ No Difference

Figure 3. Amount of engagement with faculty member

Collaborate Ultra Allowed Me To Engage With My Classmates



■ More Than Normal ■ Less Than Normal ■ No Difference

Figure 4. Amount of engagement with classmates

Table 1 displays data in relation to student engagement, teaching presence (connection to faculty member), social presence (connection to classmates), and cognitive presence (connection to course content) due to the use of Collaborate Ultra. The averages of this data were calculated on a four-point Likert scale. All the averages are 3.49 and higher, indicating that Collaborate Ultra increases student engagement, teaching presence, social presence, and cognitive presence. Very little variation was visible among the results.

Table 1

Student Engagement Data (Collaborate Ultra)

Student Engagement	Mean	Standard Deviation
The student's engagement with the course overall	3.49	± 0.69
The student's connection to the faculty member	3.51	±0.77
The student's connection to their classmates	3.49	±0.62
The student's connection to the course content	3.49	±0.84

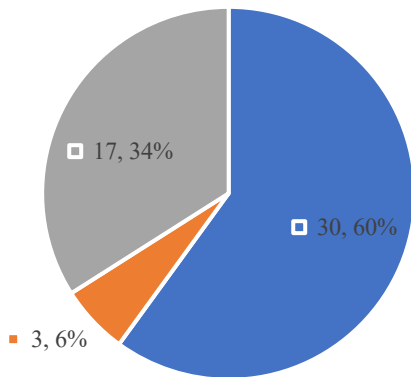
Overall, the students felt more connected to the faculty member than their classmates or course content with the use of Collaborate Ultra. According to the data displayed in Table 1, the student respondents felt a similar connection to their classmates, faculty member, and course content. It follows that Collaborate Ultra increases teaching presence more than it increases social or cognitive presence.

VoiceThread. Fifty student respondents (72.5%) reported that they used VoiceThread in their course. In this section of analysis, the respondent may have also used Collaborate Ultra in addition to VoiceThread. That respondent reported that they used the tool twice in the seven-week course. The majority of respondents (92%) had not used Voice Thread tool in the past. The respondents indicated that they used the tool for a variety of assignments and the majority of them participated by using both audio and video. More than half of the respondents (54%) also communicated with both their classmates and their instructors using the tool. This will be critical descriptive analysis in terms of the Community of Inquiry.

- 49 (98%) of respondents used the tool for a discussion board assignment
- 29 (58%) of respondents used the tool for a presentation assignment

The majority (60%) of the respondents stated (Figure 5) that VoiceThread allowed them to engage with the faculty member more than normal in an online course. The majority (80%) of the respondents stated (Figure 6) that VoiceThread allowed them to engage with their classmates more than normal in an online course. This data only included the respondents who stated that they have taken an online course in the past, since they were asked for a comparison to other online courses.

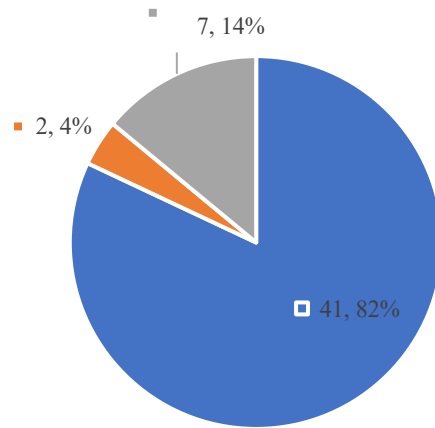
VoiceThread Allowed Me To Engage With the Faculty Member



■ More Than Normal ■ Less Than Normal ■ No Difference

Figure 5. Amount of engagement with faculty member

VoiceThread Allowed Me To Engage With My Classmates



■ More Than Normal ■ Less Than Normal ■ No Difference

Figure 6. Amount of engagement with classmates

Table 2 displays data in relation to student engagement, teaching presence (connection to faculty member), social presence (connection to classmates), and cognitive presence (connection to course content) with the use of VoiceThread. The averages of this data were calculated on a

four-point Likert scale. The averages ranged from 3.28-3.46, indicating that Collaborate Ultra increases student engagement, teaching presence, social presence, and cognitive presence. Very little variation was calculated among the data, demonstrating that most results fell close to the mean.

Table 2

Student Engagement Data (VoiceThread)

Student Engagement	Mean	Standard Deviation
The student's engagement with the course overall	3.46	±0.61
The student's connection to the faculty member	3.3	±0.81
The student's connection to their classmates	3.32	±0.84
The student's connection to the course content	3.28	±0.88

Overall, the respondents felt more connected to their classmates than the faculty member or the course content with the use of VoiceThread. It follows that VoiceThread increases social presence more than it increases teaching or cognitive presences. The overall student engagement average was the highest. This suggests that VoiceThread provides a higher than average degree of student engagement in online graduate courses.

Summary of Tool Data. The mean values for Collaborate Ultra tool usage was higher in all measurements. Collaborate Ultra received the highest average for teaching presence, indicating that Collaborate Ultra provides more engagement with the faculty member. VoiceThread received the highest average for social presence, indicating that VoiceThread provides more engagement with their classmates. The data suggests that both tools are above

average in increasing teaching, social, and cognitive presence. The data also suggests that both tools are above average for increasing student engagement.

Qualitative Student Data. There were two open-ended questions for each tool on the survey administered to all students. The first one asked about the students' technical difficulties and the second prompted them for any additional comments.

Collaborate Ultra. The student comments for Collaborate Ultra stated that while the tool was burdensome at times because of browser issues and glitches, it was beneficial for interaction and engagement. One respondent stated:

Although it was difficult for me to use in the beginning, I did start to get the hang of it towards the end of the course and enjoyed making the videos rather than typing a response. I enjoyed viewing my classmates' videos and felt that I got to know them a little better by putting a name to a face. (Student using Collaborate Ultra)

The synchronous nature of the tool is a definite limitation, as some students enroll in online courses because of the flexibility. There was some difficulty in being able to meet at a designated time for some students. One student stated, "Collaborate Ultra should be used for lectures only. Many people who take online courses work various hours and cannot engage in online set times for collaborating meetings."

VoiceThread. The student comments for VoiceThread stated, much like Collaborate Ultra, that while the technology aspect of using the tool was burdensome, it was a refreshing change from the normal text-based discussion boards. One student stated:

I like it much better than a Discussion Board (DB). The comments were real and personal. Some people described their jobs or special events that happened to them that

they would have never written in a DB. I feel much closer to my classmates now that I can see them and hear their stories. (Student using VoiceThread)

The respondents expressed that the tool allowed them to communicate ideas easily with their classmates while also getting to know them. This demonstrates the key aspects of social and cognitive presence. Another student indicated:

I personally enjoyed this much more than writing a weekly DB, it was more personal and I felt much more connected to my classmates and professor. Having said that, it was very frustrating trying to navigate and figure out all the kinks while having assignments due in class. (Student using VoiceThread)

A common theme in the respondents' qualitative data was the difference between traditional discussion boards and VoiceThread. This is notable since the VoiceThread assignments in these courses were an upgrade to the typical text-based discussion board. Discussion boards are a popular tool in online learning. In a study by Kirby and Hulan (2016), students said that discussion boards are "repetitive and redundant" (p. 93) and that "nonverbal cues are missing in responses" (p. 93). The study also pointed out that "people just use discussion boards for fluff and don't really try to interact" (p. 94). The same study had similar results in relation to VoiceThread. The students felt more inclined to participate, learned more, and agree that it more closely resembled the classroom setting.

Instructor Data

Instructor Perceptions of VoiceThread Use. Three instructors used VoiceThread in the four courses that ran with the tool in Block 1 and Block 2. One of the instructors used VoiceThread in Block 1 and both tools (VoiceThread and Collaborate Ultra) in Block 2. All the

instructors were using VoiceThread for the first time. All reported that 100% of the students participated in the tool usage and they used the tool every week.

Student engagement. The instructors responded to questions about VoiceThread related to the three elements of student engagement as described in the Community of Inquiry: social presence, cognitive presence, and teaching presence. When asked, “Do you think that the use of VoiceThread in this course allowed you to engage with your students (more than normal, less than normal, or the same)?”, three out of the four instances stated “more than normal”.

The faculty respondents provided details and insight into the three elements of the Community of Inquiry during the interviews. When talking about social presence, one faculty respondent stated, “VoiceThread allowed the students to have comradery that was similar to a face-to-face classroom,” while another stated, “VoiceThread was more than just text and allowed the students to talk about the topics while adding their experience.” The instructors agreed that VoiceThread allowed for “more interaction in the course between the students”, “verbal communication between the students”, and “the students to personally interact in the course.” The consensus on social presence was that “the students were more personal and social than typical.”

When asked about teaching presence, one faculty respondent stated, “VoiceThread was more organic and allowed for natural relationships.” They all agreed, “VoiceThread was more interactive in this setting because of the format.”

When asked about cognitive presence, one faculty respondent stated, “this allowed for the students to create natural bonds and to provide better responses during the discussion boards.” They all agreed, “VoiceThread increased cognitive presence because of the level of interaction. The students were able to build off each other and this progressed their learning” and that “the

students interacted a lot more than they would if it were a text-based discussion board. Most students only do the minimal requirement for assignments. With VoiceThread, they were doing double the number of responses. Their responses were elaborate and it pushed the other students to respond and interact more.”

When the participants were asked about the overall student engagement in the course with VoiceThread, one participant stated, “Engagement and work were consistent over the course of the term, more consistent when compared to a normal online course.” The participants seemed to agree, “There were examples, not only of engagement of content, but also non-verbal cues and expression of enthusiasm. The elaboration of ideas on assignments was similar to the engagement present in a face-to-face class,” and “VoiceThread allowed for more engagement because of verbal communication. Students tend to speak more than type.”

When asked whether VoiceThread increased student engagement in the course, all the instructors said yes. The instructors felt that VoiceThread was an effective tool in online learning because it provided peer-to-peer interaction; the students enjoyed the tool and liked hearing what other people had to say, and VoiceThread increased interactions while maintaining flexibility for the student because of its asynchronous nature. The faculty respondents all agreed that it provided an experience much closer to the face-to-face environment.

Instructor Perceptions of Collaborate Ultra Use. Four different instructors used Collaborate Ultra in the four courses that ran with the tool in Block 1 and Block 2. All but one of the instructors was using Collaborate Ultra for the first time. All reported that 100% of the students participated in the tool usage and they used the tool more than three times over the course of the term.

Student engagement. The faculty participants responded to questions about the tool that directly related to the three elements of student engagement as described in the Community of Inquiry: social presence, cognitive presence, and teaching presence.

When asked, “Do you think that the use of Collaborate Ultra in this course allowed you to engage with your students (more than normal, less than normal, or the same)?”, all of the participants stated that it was “more than normal.” One faculty member said:

Collaborate Ultra allowed me to meet with the students and verbally talk to them synchronously. They were able to communicate with me and one another with both audio and video. The verbal communication was better than the normal text communication because they could feed off each other in real time. (Instructor using Collaborate Ultra)

The students told one faculty member that “it was great to meet their classmates and the instructor.” The other faculty members validated that the tool increased engagement by stating, “The tool allowed for the peer to peer interaction that is missing from a normal online course. The ability to verbalize details and experience provided richness to the online course, normally this is missing in assignments and the syllabus,” and “Collaborate Ultra allowed for a genuine response. The students enjoyed speaking with one another and were able to have informal discussions before the sessions like a normal face-to-face class.”

When asked about social presence, three of the four instructors agreed that the tool enhanced social presence one hundred percent. The other instructor thought that only two-thirds of the class fit the social presence definition given. One participant stated, “The students had a better overall comfort level when speaking about real-world situations. This tool allowed for accountability.” The other participants validated the increase in social presence by stating, “The students were able to work together. Even the students who were more introverted interacted

during the course. Group work became more engaging because they had already had previous interaction online” and:

the tool allowed the students to get together in groups and in class. They kept saying how wonderful it was and how connected they felt. Normally they don't see the instructor or get to talk to them. They enjoyed that the instructor was there to answer questions.

(Instructor using Collaborate Ultra)

In the case of the class in which only two-thirds of the students were socially engaged, the instructor stated, “They came in early and had an informal conversation with one another. They discussed more than just the class work but talked about local events, and I could see the concern the students had for one another.” Therefore, even though only a portion (majority) of the class seemed to build connections, the connections were stronger because of the ability to see and hear each other in real-time.

When asked about teaching presence, one instructor stated the following: “I was there to answer questions and was available more than a normal online class. The students felt that it was useful and accessible.” The idea of teaching presence introduces the responsibility of instructors to not only organize, select, and deliver course content, but also to provide motivation, encouragement, and feedback to students. The participants validated this definition by stating, “I was present. We could see reactions, inflections, etc., just like being in the classroom. We could get feedback and address concerns in real time,” and “I felt like there was more engagement because I was actually teaching and not just following the template. I got to put my experience into the course content.” Lastly, one participant stated that the tool allowed for “organic and personal interaction.”

When asked about cognitive presence, one instructor stated that “the tool increased the student’s ability to learn from one another. The engagement allowed everyone to feed off one another.” Cognitive presence allows for increased cognitive processes in course content because of communication. The participants validated cognitive presence by stating, “The students worked cognitively together. They demonstrated awareness and commitment. The group work promoted their learning” and “communication was rich because of their ability to see and hear one another. There was no translation time because the discussions were done in real time.”

When asked whether Collaborate Ultra increased student engagement in the course, all the instructors replied affirmatively. They validated the level of overall student engagement by stating, “The amount of participation was overwhelming. There were people who wanted to attend both nights, when they were only required to attend one night. They were engaged in the conversation and the sessions always went longer than we allotted because of the discussion.” Another instructor stated, “The ability to hold class online synchronously and have office hours increased the ability to share and communicate overall.” Furthermore, one participant talked about the difference from other online courses by stating, “Collaborate Ultra allowed the students to interact with one another and talk about their experience. This is unusual for an online course. This tool brought engagement, awareness, and attentiveness. It felt like we were in the classroom.” Overall, the faculty members were impressed with the tool and the increased engagement. This was apparent when one instructor stated, “This tool absolutely increased student engagement in the course. The students felt more connected because they could see and hear one another. I got all positive responses about the tool usage.”

The instructors felt that Collaborate Ultra was an effective tool in online learning because it provided peer-to-peer interaction. The students enjoyed the tool and liked hearing what other

people had to say, and had increased interactions. They all agreed that it provided an experience much closer to the face-to-face environment.

Discussion and Conclusion

The result of the study to determine whether instructor-generated multimedia increased student engagement in online courses was presented. The results and findings determined that the use of either an asynchronous or a synchronous instructor-generated multimedia tool in online graduate classes increased student engagement. The results and findings were based on the Community of Inquiry where teaching, social, and cognitive presence were measured. The findings of the study were that both types of instructor-generated multimedia increased all three types of presences introduced in the Community of Inquiry. It was also determined that both types of instructor-generated multimedia increased student engagement overall in online graduate courses. It was also found that there is a difference in student engagement between the two tools.

The instructors interviewed in the study concluded that Collaborate Ultra created a more engaging environment because of the synchronous nature of the tool. The students also agreed that Collaborate Ultra created more teaching presence, while also promoting overall engagement. A study by Claman (2015) also found that engagement produced in synchronous classes was higher than in typical asynchronous online classes. In typical asynchronous text-based online courses, students report lower levels of instructor presence (Jaggars, 2014). Collaborate Ultra increased instructor presence in online graduate courses perhaps because synchronous classes most closely resemble face-to-face classroom settings. The results from Heuberger & Clark (2019) showed that the students benefitted from synchronous online courses in terms of interactivity; the synchronous environment was the preferred environment because of its ability

to connect students and faculty. It was quoted by the instructor participants in the study that “the students said it was great to actually meet the instructor” and “how connected they felt in comparison to normal online courses.”

The results and findings of this study also suggested that there is a difference in the degree of student engagement when comparing the two tools as represented in Table 3. The study determined that the use of both tools in the same course produced the highest levels of student engagement. When used alone, Collaborate Ultra had the second highest mean values. When used alone, VoiceThread had the lowest overall mean values. This supports the qualitative instructor findings that there was a difference in student engagement between the use of asynchronous and/or synchronous instructor-generated multimedia. The students and the instructor preferred the use of a synchronous instructor-generated multimedia tool such as Collaborate Ultra. However, the use of either a synchronous or an asynchronous instructor-generated multimedia tool improved student engagement when compared to other online courses.

Table 3

Student Engagement	Mean		
	Collaborate Ultra	VoiceThread	Both
Faculty members overall ability to engage students	3.35	3.25	3.67
The student’s degree of engagement with the faculty member	3.5	3.15	3.54
The student’s degree of engagement with their classmates	3.28	3.14	3.54
The student’s degree of engagement with the course content	3.39	3.26	3.44

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