

## Using Web Conferencing Tools for Preparing Reading Specialists: The Impact of Asynchronous and Synchronous Collaboration on the Learning Process

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### Abstract

*Web conferencing as an online instructional tool is becoming widely used in many literacy programs in graduate education. However, little is known about how faculty combines asynchronous and synchronous web conferencing technology to enhance pedagogical content knowledge. Thus, the purpose of this study was to determine the impact of a graduate reading methods course offered via synchronous web conference tools combined with an asynchronous component that supports graduate literacy candidates working as literacy coaches and reading specialists. The data indicated a paradigm shift in the way online courses should be taught via two types of online instruction (asynchronous text-based materials and synchronous web conferencing lectures) to emulate traditional face-to-face lectures. Results suggested 93% of graduate students would prefer to take an online course that uses both synchronous web conferencing lectures and asynchronous text-based instruction. Eighty-seven percent of graduate students felt that participating in synchronous web conferencing lectures in addition to using the asynchronous text-based lecture materials increased their understanding of the course material.*

For more than a decade, distance learning has been a part of higher education in every postsecondary institution. Administrators who thought that an instructor's physical presence in a classroom contributed to the success of the students and the program pedagogically and economically are now encouraging their academic faculty members to teach via video conferencing—a viable alternative (Peterson & Slotta, 2009). To expand offerings, bolster enrollment and revenue streams, and reach remote students, many administrators are willing to offer web-enhanced courses because they think technology-based classrooms can produce better results than the conventional classroom. Such views are supported by many researchers who suggest distance teaching and learning can be equal to or better than in-person teaching in a traditional classroom (Karabulut & Correia, 2008). A web-enhanced course is classified as an online class wherein face-to-face instruction is integrated, with a substantial amount of “seat time” in the traditional classroom being substituted with internet-based activities. Ultimately, the goal of hybrid instruction is the creation of synchronous and asynchronous learning communities that enable students to create networks of interactions in which deep learning takes place (Li & Atkins, 2005; Wang & Newlin, 2000).

Web conferencing as an online instructional tool is becoming widely used in many literacy programs in graduate education. However, it is difficult to find a systematic empirical study of how the collaborative competencies of graduate students and course instructors impact literacy learning in any online environment (Bodzin & Park, 2016). The purpose of this study was to determine the impact of a graduate reading methods course offered via synchronous web conference tools in combination with an asynchronous component that supports graduate literacy candidates who were working as literacy coaches and reading specialists.

### Background

Many higher education institutions have sought to expand online graduate programs and courses, identifying such measures as critical to the institution's financial stability and growth. Expanding course and program offerings to include online formats is described as an asset with a relatively lower cost and limited impact on the physical campus. As a result, many universities have made greater efforts to provide faculty with substantive professional development on online teaching and learning over the past 2 decades. Central to this professional development is the principle that Palloff and Pratt (1999) described as follows:

Electronic pedagogy is not just about fancy software packages or simple course conversion. It is about developing the skills involved with community building among a group of learners so as to maximize the benefits and potential that this medium holds in the educational area. (p. 159)

For faculty, online and web-enhanced courses pose particular challenges because class sessions take place in a traditional classroom, but technology is used to facilitate activities, deliver content, and/or assess students. The multimodal synchronous online environments often rely on active participation, the demonstration of teaching practices, field-based experiences, and, in many cases, smaller class sizes. Therefore, teaching online for faculty consumes even more time and energy than teaching in the classroom, and students' participation will falter if the instructor is not perceived by students as being right there online with them, leading by example through his or her commitment of time and energy (Fuest, 2007; Keir & Elizondo, 2010).

Although hardworking and serious about their studies, graduate students in a distant location are not connected meaningfully with their peers and instructors (Kanuka, Collett, & Caswell, 2002). Danielson (1996) advocated that learning communities must be created in an online environment in which all students become engaged through discussions, which can occur through synchronous chats or asynchronous-threaded discussions (Hiltz & Turoff, 2005). Gambrell and Almasi (1996) concluded that through discussion, students are "active learners who engage in the construction of knowledge ... rather than simply learn the meanings that others have created" (p. 27). Schwartzman (2006) noted that the explicit teamwork in online threaded discussions also increases pedagogical knowledge among students. Evidence suggests that more interactive course environments improve students' professional knowledge and increase satisfaction with the course (Li & Akins, 2005). However, many online instructors and students prefer asynchronous-threaded or multiple-threaded discussions that allow them to respond at their convenience (Vonderwell & Zachariah, 2005).

Within the synchronous virtual environment, social interaction and connectivity engages students as they interact with each other during group projects. As Li and Akins (2005) pointed out, "Interaction may be fundamental in many learning processes and even more so in online environments. Online educators need to strive to increase and engage interaction" (p. 53). Durrington, Berryhill, and Swafford (2006) noted that the "research in both online contexts suggests that student interactivity contributes to positive student learning experiences and is a key to effective instruction" (p.190). In web-enhanced classes, students become supportive participants with their peers as instructors nurture the growth of the learning communities so that "the collaborative effort among the learners helps them achieve a deeper level of knowledge generations" (Pallof & Pratt, 1999, p. 110).

The online environment, with the addition of synchronous tools such as Zoom<sup>®</sup>, provides a high level of motivation to graduate students (Coffey, 2010). Graduate students access Zoom software from a server and join the synchronous interactive environment from a desktop or laptop computer without having to go to a meeting place. Examples of Zoom synchronous online formats include chat rooms, audio/video conferencing, and two-way live broadcast lectures. Because it is a live online class, graduate students have a high level of involvement with the content that is presented in the class through their discussions and questions (Skylar, 2009). In the online learning environment, synchronous web conferencing tools allow the instructor to present slides and websites, share files and applications, and poll and query students on topics related to research. Instructors also can assign students to online breakout rooms and encourage them to have small-group discussions while logged into the virtual room (Shi & Morrow, 2006).

Synchronous systems used in conjunction with asynchronous tools can create an online learning community that provides support to students from both peers and instructors because the web-enhanced classes enhance the interaction and create a sense of connectedness among students (Beattie, Spooner, Jordan, Algozzine, & Spooner, 2017). Web conferencing via the Zoom product has been shown to be effective not only in delivering course content but also in creating an ongoing communication network among graduate students and instructors and in providing other types of instructional and professional support. For example, web conferencing via Zoom can serve as a collaborative tool to allow students from widely disbursed communities to share common interests and concerns and engage in joint problem-solving in real-life classroom situations. When used in university coursework and other professional development activities, it can be comparable to having face-to-face discussions in a conventional class setting. With Zoom web conferencing, the course instructor can arrange learners into any size group and have them work together on assigned tasks, projects, brainstorming activities, and application exercises (Beattie et al., 2017).

The asynchronous format of web conferences via Canvas<sup>®</sup>, a learning management system software, allows graduate students to become creative and innovative because they have more time to prepare a response to a set of directions or questions. For example, Wade, Niederhauser, Cannon, and Long (2001) stated that in a traditional face-to-face class, an instructor's queries are often not fully responded to because graduate students do not have sufficient time to research or to think critically. As a result, their answers are often spur-of-the-moment, shallow, and incomplete. By contrast, in a web conference, graduate students develop the ability to (a) use technology effectively and productively; (b) conduct research and use information; (c) think critically, solve problems, and make decisions; and (d) be ethical digital citizens (Harasim, 1990).

Since web discussions can go on for days or longer, graduate students also have the opportunity to comment on classmates' responses, ask for clarification of ideas, or consider differing viewpoints. Instructors can more easily accommodate the group's needs and provide clarification as needed, while instructors in traditional courses often have to divide their time among several groups and delay feedback until the end of an activity. Thus, it is not surprising that graduate students feel web-enhanced courses allow them to apply a deeper understanding of concepts on issues and ideas in which they are actively engaged in knowledge construction processes (Bodzin & Park, 2016).

Despite the growth in the use of synchronous tools to facilitate online instruction, little is known about how faculty combine asynchronous and synchronous web conferencing technology to enhance pedagogical content knowledge (Skylar, 2009). The role of interactivity in asynchronous and synchronous environments is important, particularly as it relates to its effect on student learning and satisfaction (Stephens & Mottet, 2008). Research suggests that interaction in both asynchronous and synchronous environments should result in increased learning. However, these arguments are more theoretically supported rather than empirically supported (Allen, Mabry, Bourhis, Tittsworth, & Burrell, 2004). Thus, this study examined the impact of a collaborative asynchronous/synchronous graduate reading methods course designed to support graduate literacy candidates working as literacy coaches and reading specialists.

### **Graduate Reading Methods Course and Instructional Activities**

The purpose of a reading methods course is to allow graduate students to explore a topic related to in-depth literacy development and to provide leadership in literacy in the teachers' schools and districts (Quatroche, Bean, & Hamilton, 2001; Swartz, 2005). The graduate reading methods course included in this study was offered by a midwestern university's Department of Early Childhood and Elementary Education program. The course was designed to further develop the graduate students' pedagogical content knowledge, coaching skills, and professional dispositions in the following domains: data-based decision-making and evidence-based practice. The objectives were to help graduate students pursue individual professional knowledge and behaviors through professional activities and leadership and to use literature and research about professional development and school culture to build effective professional development programs in their school or district. The aims were to encourage graduate students to reflect on teaching and learning in the schools and districts in which they teach, determine needs, and decide on a leadership project to improve teaching and learning. The graduate students were also encouraged to reflect on the effectiveness of their leadership project through the project evaluation.

The course was offered as a web-enhanced course for 3 credit hours. It was separated into two categories— asynchronous and synchronous—so graduate students experienced both conditions: synchronous interactive web conferencing lectures and asynchronous text-based lectures. Instructors used online tools to create a web-enhanced course in which one-third of the sessions were offered through Canvas asynchronous online learning (text-based, using discussion boards), and two-thirds of the sessions were offered with the newer web synchronous conferencing tool Zoom.

A typical class week included the graduate students downloading text-based lecture notes (e.g., PowerPoint, Google document, Word), reading a chapter in the textbook to correspond with the lecture notes, and responding on a discussion board at the end of the week. All course contents were available for graduate students in an asynchronous format and organized by Canvas module tools. Web conferencing lectures were structured to mirror a face-to-face classroom. The interactive nature of the Zoom instructional tools provided a real-time virtual classroom using two-way audio, a webcam, breakout rooms, a chat window, and application sharing.

### **Methods**

The approach of this study was quantitative in nature. The purpose of quantitative research is to observe phenomena or occurrences affecting populations. Quantitative research is used to learn about data that are observed or measured to examine questions about the sample population. Quantitative research allows answers to questions about the frequency of a phenomenon or the magnitude to which the phenomenon affects the sample population (Creswell, 2013).

The study included 15 graduate students who were enrolled in the course during the fall of 2018. The ages of the graduate students ranged from 25 to 40 years old. All were White female classroom teachers. Of the 15 teachers, 75% had taught for 3 years or less, and 25% had over 5 years of teaching experience.

The instructor/researcher used a survey methodology to assess important impacts of using asynchronous and synchronous tools as the primary course delivery format. A survey was administered to all graduate students enrolled in the online course as a voluntary evaluation procedure at the end of the course. The survey consisted of questions on a Likert scale of 1-5, with 1 equaling *strongly disagree* and 5 equaling *strongly agree*. Several questions asked graduate students about their preferences regarding asynchronous and synchronous methods.

The graduate students responded anonymously to the survey questions and were informed that their responses would not affect their course grade. The survey responses were gathered electronically, and the results were calculated by a research assistant who was not an instructor in the course. The purpose of the survey was to learn what motivated survey respondents and what was important to them, as well as to gather meaningful opinions, comments, and feedback. The feedback was the baseline to measure and establish a benchmark from which to compare results over time. The survey provided a snapshot of attitudes and behaviors—including thoughts, opinions, and comments—about the target survey population (Dillman, Smyth, & Christian, 2014).

Data for this study were collected throughout the fall 2018 academic term. The data included a leadership project report, graduate student exit reflections on their teaching and learning, cooperating teachers' evaluations, group discussions that took place on Canvas, and a course survey. Assignments were evaluated based on whether a student presented ideas that reflected integration of course material and critical thinking skills. Grades were assigned according to expectations for a particular assignment relative to the material covered in the class. Each piece of data was graded using a 100-point evaluation rubric (see Table 1). The cooperating teachers were asked to respond to a field experience evaluation form to assess the impact of the class and the progress and needs of the graduate students. Their comments and feedback data were used to assess the academic and professional expertise of the graduate students, and their input provided guidance and implications for ways to improve literacy coaching.

**Table 1 Essential Benchmark Evaluation Rubric**

<b>ILA Standards for the Preparation of Literacy Professionals 2017</b>	<b>Outstanding</b>	<b>Satisfactory</b>	<b>Unsatisfactory</b>
ILA 1.1, 1.2, 1.3, 1.4; 2.1, 2.2, 2.3, 2.4; 3.1, 3.2, 3.3, 3.4; 4.1, 4.2, 4.3, 4.4; 5.1, 5.2, 5.3, 5.4; 6.1, 6.2, 6.3, 6.4; 7.1, 7.2, 7.3, 7.4	Candidate exhibits a defined and clear understanding of the assignment. Evaluation of coaching provides impressive and detailed evidence of candidate's understanding of importance of students' interests, reading abilities, and backgrounds in planning reading programs and in selecting materials for reading instruction, as well as the ability to effectively model, coach, and support classroom teachers.	Candidate establishes a good comprehension of the assignment. Evaluation of coaching provides some evidence of candidate's understanding of importance of students' interests, reading abilities, and backgrounds in planning reading programs, and in selecting materials for reading instruction, as well as the ability to model, coach, and support classroom teachers.	Candidate lacks basic understanding of the assignment. Evaluation of coaching demonstrates candidate's lack of understanding of importance of students' interests, reading abilities, and backgrounds in planning reading programs, and in selecting materials for reading instruction, as well as the inability to model, coach, and support classroom teachers.
ILA 6.1, 6.2, 6.3, 6.4	Reflective narrative addresses how standard is met reveals candidate's in-depth understanding of the standard and the importance of students' interests, reading abilities, and backgrounds in planning reading programs and in selecting materials for reading instruction, as well as the importance of being able to effectively model, coach, and support classroom teachers.	Reflective narrative addresses how standard is met reveals candidate's general understanding of the standard and the importance of students' interests, reading abilities, and backgrounds in planning reading programs and in selecting materials for reading instruction, as well as the importance of being able to effectively model, coach, and support classroom teachers.	Reflective narrative addresses how standard is met reveals candidate's lack of understanding of the standard and the importance of students' interests, reading abilities, and backgrounds in planning reading programs and in selecting materials for reading instruction, as well as the importance of being able to effectively model, coach, and support classroom teachers.
ILA 4.1, 4.2, 4.3, 4.4; 5.1, 5.2, 5.3, 5.4	Reflective narrative reveals candidate's in-depth understanding of the standard and the importance of using various books and non-print materials appropriate for a diverse group of learners in reading programs, as well as the importance of being able to effectively model, coach, and support classroom teachers and paraprofessionals in using students' interests and background experiences to select appropriate materials.	Reflective narrative reveals candidate's general understanding of the standard and the importance of using various books and non-print materials appropriate for a diverse group of learners in reading programs, as well as the importance of being able to effectively model, coach, and support classroom teachers and paraprofessionals in using students' interests and background experiences to select appropriate materials.	Reflective narrative reveals candidate's lack of understanding of the standard and the importance of using various books and non-print materials appropriate for a diverse group of learners in reading programs, as well as the importance of being able to effectively model, coach, and support classroom teachers and paraprofessionals in using students' interests and background experiences to select appropriate materials.
ILA 6.1, 6.2, 6.3, 6.4; 7.1, 7.2, 7.3, 7.4	Candidate exhibits a defined and clear understanding of the assignment. Evaluation of coaching provides impressive and detailed evidence of candidate's ability to effectively model, coach, and support classroom teachers in various ways of modeling reading and writing as valued lifelong activities to their students in classroom.	Candidate exhibits a general understanding of the assignment. Evaluation of coaching provides some evidence of candidate's ability to model, coach, and support classroom teachers in various ways of modeling reading and writing as valued lifelong activities to their students in classroom.	Candidate lacks basic understanding of the assignment. Evaluation of coaching demonstrates candidate's inability to effectively model, coach, and support classroom teachers in various ways of modeling reading and writing as valued lifelong activities to their students in classrooms.
ILA 6.1, 6.2, 6.3, 6.4; 7.1, 7.2, 7.3,	Reflective narrative addressing how	Reflective narrative addressing how	Reflective narrative addressing how

ILA Standards for the Preparation of Literacy Professionals 2017	Outstanding	Satisfactory	Unsatisfactory
7.4	standard is met reveals candidate's in-depth understanding of the standard and the importance of effectively modeling, coaching, and supporting classroom teachers in various ways of modeling reading and writing as valued lifelong activities to their students in classroom.	standard is met reveals candidate's general understanding of the standard and the importance of effectively modeling, coaching, and supporting classroom teachers in various ways of modeling reading and writing as valued lifelong activities to their students in classroom.	standard is met reveals candidate's lack of understanding of the standard and the importance of effectively modeling, coaching, and supporting classroom teachers in various ways of modeling reading and writing as valued lifelong activities to their students in classroom.
ILA 7.1, 7.2, 7.3, 7.4	Candidate exhibits a defined and clear understanding of the assignment. Modeling provides impressive and detailed evidence of candidate's commitment to the development of professional knowledge and dispositions and candidate's ability to effectively conduct study groups for paraprofessionals and teachers aimed at assisting them in implementing recommendations to improve adopted reading program to meet needs of all learners.	Candidate exhibits general understanding of the assignment. Modeling provides some evidence of candidate's commitment to the development of professional knowledge and dispositions and candidate's ability to effectively conduct study groups for paraprofessionals and teachers aimed at assisting them in implementing recommendations to improve adopted reading program to meet needs of all learners.	Candidate lacks basic understanding of the assignment. Modeling demonstrates evidence of candidate's lack of commitment to the development of professional knowledge and dispositions and candidate's inability to effectively conduct study groups for paraprofessionals and teachers aimed at assisting them in implementing recommendations to improve adopted reading program to meet needs of all learners.

### Results and Discussion

The purpose of this research was to determine the impact of a graduate reading methods course offered via synchronous web conference tools combined with an asynchronous component that supports graduate literacy candidates who were working as literacy coaches and reading specialists. The collected data were analyzed, and findings are presented below according to graduate student feedback (based on data gathered via a course survey) and graduate student performance (based on data related to the leadership project, exit reflections, cooperating teachers' evaluations, and group discussion boards).

#### Graduate Student Feedback

Graduate student feedback was assessed via a course survey. For the survey, descriptive statistics were calculated for each survey item on a 5-point Likert scale, with 1 indicating *strongly disagree* and 5 indicating *strongly agree*. Fifteen out of 15 graduate students completed the survey. Results suggested 93% of graduate students would prefer to take an online course that uses both synchronous web conferencing lectures and asynchronous text-based instructions. Eighty-seven percent of graduate students felt that participating in synchronous web conferencing lectures in addition to using the asynchronous text-based lecture materials increased their understanding of the course material. One graduate student wrote:

Web-based conferencing encouraged me to develop a higher degree of ownership, enabling me to direct the discourse of the class, to establish ongoing relationships with instructors and peers, to make informative decisions together, and to take greater responsibility for the learning process. Canvas lectures showed me that I can still effectively learn materials outside of a traditional lecture.

Ninety-three percent of the students strongly agreed that the asynchronous format stimulated a productive weekly discussion and helped highlight the learning that took place. The same 93% also indicated that (a) synchronous web conferencing produced an effective learning dialogue among classmates, (b) the collaboration enabled them to meet course objectives, (c) the discussions facilitated their understanding of literacy coaching concepts and methods, and (d) the overall approach helped them apply the course material to their practicum positions.

The findings from this study indicate that web conferencing can be a useful tool for building a valuable professional and emotional support network among graduate students. Ninety-three percent of graduate students said they strongly agreed that they felt like part of a learning community in the course, and all of them indicated the online interactions had a friendly atmosphere. Almost 93% of graduate students reported feeling a greater level of connectedness with classmates during web discussions, while only 1% said they felt less connected to their classmates. As one graduate student noted:

I felt comfortable with one another in asking and answering questions, giving personal examples, offering suggestions, expressing opinions and interacting in meaningful ways. Web conference allowed me to develop a continuing relationship with instructors and peers between class sessions, just as campus learners do.

These findings support other literature that has shown that the use of web conferencing in education positively correlates with course satisfaction (Beattie et al., 2017) and is generally positively received by graduate students (Bodzin & Park, 2016). Moreover, the use of web conferencing to supplement traditional language education approaches has resulted in insignificantly higher positive marks (Bryer & Seigler, 2012) and improvement in the quality of the learning experience for graduate students in literacy (Offir, Lev, & Bezalel, 2008).

### **Graduate Student Performance**

Graduate student performance was assessed via several aspects. For instance, graduate students' knowledge and educational concepts and theories were evaluated through exit reflections. Their ability to express their knowledge of educational concepts and theories within the conventions of academic discourse were assessed through the leadership project report and discussion boards. Integration of information from lectures, readings, discussions, and field experiences was also taken into consideration. Finally, the academic and professional expertise of the graduate students was assessed via cooperating teacher feedback.

The instructor/researcher articulated criteria such as outstanding, satisfactory, and unsatisfactory for work that corresponded to letter grades. The assignment of the letter grades was based on a graduate student's total score (a number between 0 and 100). The instructor/researcher explained and interpreted the evidence of the graduate students' performance through a feedback sheet and the evaluation rubric that were applied to all students. Grades were determined in accordance with the university's policy and written guidelines that were distributed among graduate students via Canvas. Overall, the results of the study showed that the performance data fell overwhelmingly in the *outstanding* or *satisfactory* column and had a mean score of 90.5 (see Figure 1). The data from the rubric revealed that 100% of the graduate students carried out coaching roles through practices that involved demonstration and observation, pre-conference meetings, worksite activities, debriefings, and classroom follow-up. The online learning community enabled graduate students to create a network of interactions in which deep learning took place. Cosgrove (2014) noted that "the research in online contexts suggests that student interactivity contributes to positive student learning experiences" (p.21).

More specifically, the data from the leadership project report revealed that one-fifth of the teachers designed, monitored, and assessed reading achievement progress and helped classroom teachers make the content of their subject more comprehensible to children so they could truly understand the complex information in their textbooks. Eighty-seven percent of the graduate students agreed or strongly agreed that the size of their group facilitated a high degree of student-student interaction during online discussions, and an equal percent indicated they were able to learn about coaching responsibilities by interacting with each other.

The cooperating teachers' evaluations indicated that 93% of the graduate students coached a team of classroom teachers as they explored and shared ideas about classroom environment, grouping, inclusion, and gradual-release instruction. Eighty percent of the graduate students also presented some workshops in which they modeled best literacy practices and launched some small-group collaboration. Seventy-three percent of the graduate students said that both the synchronous and asynchronous portions in the blended class afforded them the opportunity for more active learning and increased their likelihood to try out ideas/strategies that were explored during online sessions.

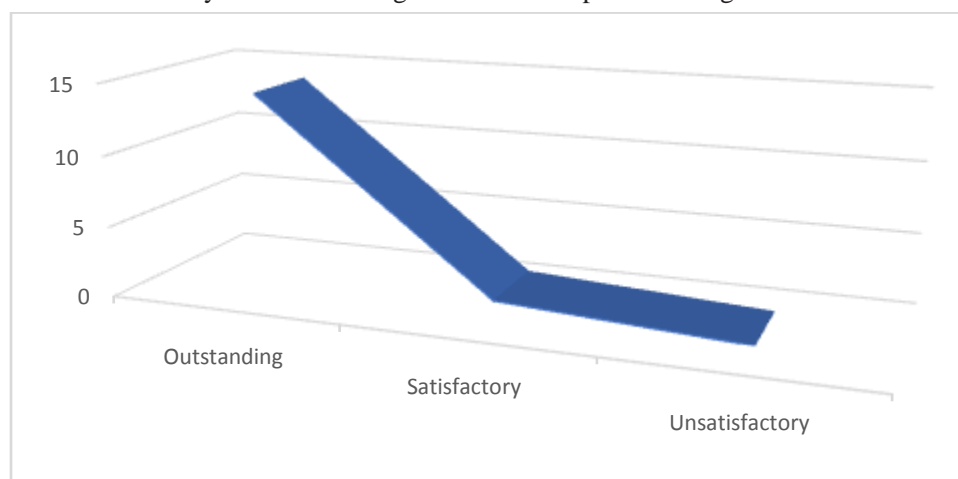


Figure 1. Performance data from online classroom participants (mean score = 90.5; score of 3 = *outstanding*, score of 2 = *satisfactory*, score of 1 = *unsatisfactory*).



At least 90% of the graduate students (a) provided professional development focused on establishing an inviting classroom environment and differentiating reading instruction; (b) began organizing a book room for small-group instruction and revitalizing classroom libraries for independent reading; and (c) initiated professional book studies and conversations about writing instruction. The cooperating teachers were very satisfied with the graduate students' professional development role and said that participants have had successful experiences teaching and mentoring.

The participant reflection paper and group discussions that took place on Canvas suggested that 93% of graduate students served as a mentor for classroom teachers who wanted to talk about issues, problems, or ideas about reading instruction and assessment. Ninety-three percent of participants collaborated with a team of classroom teachers in sharing their issues and concerns, developing shared beliefs, investigating and understanding effective literacy practices, and opening up their teaching for reflection. The use of web conferencing to supplement traditional approaches resulted in significantly higher assessment marks and improvement in the quality of learning experience for graduate students. This finding is consistent with previous research that found that the use of web conferencing in education positively correlates with deeper levels of learning (Huang & McConnell, 2010). The graduate students reflected at a deeper level and included a variety of perspectives in their descriptions of the coaching experiences. The reflection data fell in the *outstanding* column and had a mean score of 90.

One participant wrote about practicum experiences that included opportunities for working with teachers:

Working collaboratively with colleagues is an important aspect of being a literacy coach. Communicating results and offering advice during the course of this project gave me a sneak peek of a literacy coach's job. Within the virtual environment, social interaction and connectivity engages us as we learn from each other during leadership project. The collaborative effort helps us achieve a deeper level of knowledge generation.

Ninety-three percent of graduate students felt that using synchronous web conferencing lectures in addition to the asynchronous text-based materials increased their understanding of the course material. Almost 87% said that the advanced online web-enhanced methods course gave them an opportunity to apply and enhance their coaching training. The two major roles identified as most important in participants' ability to serve as a resource to other teachers were the following: (a) assist teachers by demonstrating ideas and strategies that can improve instruction and assessment, and (b) support teachers in planning and administering professional development. Several characteristics were identified that appeared to lead to successful collaboration. These included *receptive to change, commitment, creating a professional learning community, and positive interaction*.

Because this was an online class, graduate students had a potentially higher level of control over the content, and they also had a potentially greater role in shaping the subject matter that was presented in the class through their discussions and questions. The overall results suggested that the web-enhanced class offered considerably more opportunity for students as they developed leadership skills in complex contexts and developed ownership in the learning process. The leadership role emerged as a critical component of literacy coaches, and graduate students grew into a leadership position as they assisted classroom teachers by modeling strategies and suggesting materials that can enhance instruction and assessment and by supporting teachers in becoming more knowledgeable about the teaching of reading. Thus, the results of this study indicate that graduate students gained a better understanding of how to assume a leadership position among their peers. Ninety-three percent of graduate students said that the web-enhanced course helped them become more confident in their ability to guide classroom teachers in their pursuit of instructional growth.

The graduate students logged into the Zoom web conference, employed strategies that encouraged critical thinking, and answered questions about assignments through Canvas. Seventy-three percent said that the synchronous voice, text-chat, note-taking, whiteboard, and screen-sharing functionalities provided powerful tools to present coaching information, model coaching processes, and share coaching concepts with other classmates. Overall, these results suggest that the majority of the graduate students used their knowledge and performance skills to make an impact by demonstrating lessons and communicating and collaborating with classroom teachers. More than 90% of teachers demonstrated lessons, assisted teachers in selecting best literacy practices, trained classroom teachers to administer and interpret assessments, presented professional workshops, conducted study groups, assisted classroom teachers in preparing technologically based information, assisted with assessment, and co-planned appropriate instruction. These results are consistent with previous research suggesting that when graduate students provide professional development and support to classroom teachers to improve the instructional capacity, their ability to express knowledge of educational concepts and theories within the conventions of academic discourse increases (Blachowicz, Obrochta, & Fogelberg, 2005; Hall, 2004).

## Conclusion

The purpose of this study was to determine the impact of a graduate reading methods course offered via synchronous web conference tools combined with an asynchronous component that supports graduate literacy candidates working as literacy coaches and reading specialists. Fifteen reading and writing graduate students received instruction in two different online learning environments (asynchronous text-based lectures using Canvas and synchronous web conferencing lectures using Zoom). The results suggested that both types of online instruction were effective for delivering lectures. In addition, almost two-thirds of the students indicated that they would rather take an online course that uses synchronous web conferencing lectures rather than an online asynchronous text-based lecture course. This finding is consistent with previous research that suggests the importance of synchronous web conferencing collaboration on student satisfaction in a course (Beattie et al., 2017; Shi & Morrow, 2006).

Prior research on online instruction has focused on areas taught via Canvas communication tools. However, further research on the use of newer multimedia technologies, such as interactive synchronous web conferencing tools, is needed. Zoom and Elluminate Live<sup>®</sup> are examples of synchronous online environments. The advantage of using an electronic communication and discussion medium for learning provides impetus for further integration of this type of technology into university courses (Allen et al., 2004). Various future research components might include measuring (a) the impacts of the course and satisfaction of students in these newer environments; (b) the level of collaboration strategies used between the graduate students and instructors; (c) qualitative data in the form of interviewing graduate students and instructors and reporting their experiences over time; and (d) the level of technological support/barriers graduate students encounter enrolling in a web-enhanced class. Future research should also continue to explore the overall effectiveness of these environments as instructors use these newer online instruction methods (Skylar, 2009). In addition, whether use of the electronic conferencing medium makes a difference in graduate students' approach to technology in their future teaching might be a subject for a longitudinal study (Bodzin & Park, 2016).

Feedback from supervising teachers in this study was very positive. However, based on this research, the majority of graduate students were not confident about taking on multiple roles within their schools to improve the quality and effectiveness of reading instruction for all children. Nonetheless, while more than 87% of graduate students in this course reported that they were not confident taking on the role of a literacy coach, once they began coaching, they found it to be a rewarding, empowering experience that reinforced their knowledge and skill as a literacy coach. Universities are being challenged to prepare reading specialists who are not only exemplary graduate students but also skilled literacy coaches who can build capacity in other teachers through mentoring and coaching relationships (Spelman & Allman, 2007). Future research is needed to determine how to fully integrate this new role into graduate programs or determine whether universities' literacy programs should re-examine their curricula for reading specialists and give teachers more built-in opportunities to learn how to fulfill major areas of responsibilities as literacy coaches (Vogt, Carr, & Shearer, 2019).

Finally, the data from this study indicate support for a paradigm shift in the way online courses are taught—via two types of online instruction (asynchronous text-based materials and synchronous web conferencing lectures)—to emulate traditional face-to-face lectures. Although research shows that web conferencing can be an effective tool for a variety of professional course offerings, there is little evidence of its usefulness serving as a primary course delivery format in a graduate program. Therefore, future research needs to do a more in-depth comparison study on graduate students' views on web-conferencing versus their views on conventional on-campus teaching methods (Beattie et al., 2017; Fuest, 2007; Karabulut & Correia, 2008; Keir & Elizondo, 2010).

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