Interactive Videoconferencing: Connecting Theory to Practice for Preservice Teachers

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Abstract

The purpose of this work is to examine using interactive videoconferencing (IVC) to provide preservice teachers with a model of exemplary reading instruction to transfer their learning and implement effective reading instruction. The program was facilitated by university professors and carried out though frequent interactions between preservice teachers and a number of master teachers employed in public school classrooms. The program's success was based upon the extent to which IVC was considered helpful to preservice teachers attempting to link theory to practice. Data from this program evaluation suggest that, when using IVC technology to prepare new teachers to become more effective reading teachers, teacher candidates expressed improvements in both their ability to, and confidence for, providing better reading instruction. Based on this program evaluation, we the researchers postulate that IVC may be a powerful tool for helping prepare new teachers to meet the many challenges inherent in teaching today. (Keywords: preservice teachers, technology, learning)

In an effort to meet the challenge of graduating candidates who are underprepared to meet the challenges in today's schools (Haberman, 2005), higher-education institutions are searching for new ways to improve teacher preparation in the interest of producing high-quality teachers who will stay in the profession. The causes of teachers being underprepared and ultimately quitting the profession are varied. However, teacher preparation programs must help reduce the statistic of more than 50% of new teachers in low-income schools leaving the profession in the first 5 years of teaching, as instructional damage to children becomes nearly irreversible (Darling-Hammond & Sykes, 2003: Hare & Heap, 2001). As a result, various techniques, such as the use of technology, are now being implemented to address this challenge.

Using a Multifaceted Solution

Within the southeastern region of the United States—which, according to Haberman (2005), has one of the highest teacher turnover rates in the country—the University of South Alabama has begun increasing its efforts to boost teacher retention rates. It has taken specific actions with one goal in mind: producing high-quality teachers who are able to meet the needs of the students they will teach and who are committed to lifelong learning. In working to create the link between theory and practice while keeping the above-mentioned goal in mind, the university took the following multifaceted actions:

- Efforts to increase preservice teacher candidates' exposure to and experience in low socio-economic schools
- Efforts to increase guidance and support by providing preservice candidates with a mentorship team composed of educators from both the university and participating local schools
- Efforts to increase guidance and support by providing a mentorship team to new teachers who have been identified as in danger of failing or quitting the profession
- Efforts to raise the standards for admissions for candidates entering the program

As these efforts were being put into place, the College of Education faculty was continuously searching for retention strategies that could be used in the classroom. Two reading faculty members met with groups of preservice candidates, new teachers, and administrators from local school districts to determine central concerns, and then began searching for tools to address the concerns. The two main concerns expressed in these conversations were the preservice teachers' ability to implement research-based teaching strategies in reading and their ability to effectively manage the classroom. From this feedback, the researchers immediately began their quest to strengthen the Methods of Teaching Reading course, focusing on classroom management and organization during the reading block, and modeling reading methods.

As the university began to increase the use of technology in courses, it directed efforts in using technology to address the current issues in teacher preparation. A review of literature on the uses of technology in teacher preparation revealed a variety of uses, but none seemed to directly address our local concerns. It was through these efforts of meetings with administration, reviewing the literature, talking with preservice teachers, and examining the data that interactive videoconferencing (IVC) began being used in reading methods courses.

Using Interactive Video Technology to Enhance the Teaching of Reading

During the past decade, several innovative methods have been established and commonly used to enhance instruction in teacher preparation programs. One such method includes video case studies.

These studies are geared toward building on classroom contexts and have often been used to present preservice candidates with the complexity and authenticity of real-life classroom settings (Beck, King, & Marshall, 2002; Kurz, Llama, & Savenye, 2005).

The Internet and multimedia have directly affected video cases as well. Nonlinear Web-based video with audio, graphics, and text can be integrated to provide rich experiences. Various projects in the recent past, such as eSTEPWEB, Understanding Teaching, Case Technologies for Early Literacy Learning, Integrating New Technologies into the Methods of Education, and Best Practices, have been used in preservice teacher preparation programs through the use of online video cases (Kurz, Llama, & Savenye, 2005). As a result, these cases have been shown to increase preservice candidates' motivation and to support their overall learning and growth (Kurz, Llama, & Savenye, 2005). Creating high-quality video case studies, however, can often be time intensive and quite costly.

Another common video-based strategy teacher preparation programs use involves recording classroom lessons. In particular, video classroom lessons provide a common framework for discussion, allow for multiple viewings, and provide opportunities for all candidates to reflect and share their perspectives (Lambdin, Duffy, & Moore, 1997). Furthermore, digital video, some of which may be Web supported, such as the Inquiry Learning Forum, is becoming a more widely used instructional tool because users can control the video stream through a scrollbar and instantaneously move to any specific frame or sequence. Users can view frames individually in a step-by-step manner (Barnett, Harwood, Keating, & Saam, 2002; Constantinou & Papadouris, 2004). Though time consuming, this technology has proven to be effective overall in allowing preservice and inservice teachers to have conversations related to specific actions and situations that take place in classrooms between teachers and students (Constantinou & Papadouris, 2004; Lambdin, Duffy, & Moore, 1997).

Another video-based method for bridging the gap between theory and practice has been implemented in Singapore. Here, desktop videoconferencing was used to conduct weekly conferences with preservice candidates in the field (Sharpe, Hu, Crawford, Gopinathan, Khine, Moo, & Wong, 2003). The conferences involved five preservice candidates at different school locations and one supervisor located at the university. Each week, preservice candidates also recorded their teaching and streamed the video to the university, where the recordings were viewed, analyzed, and discussed in the postobservation conferences. Although both the supervisor and candidates enjoyed the added benefit of reduced travel time, a major goal for the use of this conferencing technology was enhancing preservice candidates' reflection. The data gathered by the researchers demonstrated that the experience did, in fact, improve the reflection of these five students, as evidenced by a comparison of their field logs to those of other students.

Videoconferencing

The term videoconferencing is used to describe a system where two or more participants in different locations can interact using specialized equipment through a high-speed Internet connection (Smith, 2003). Though its implementation began two decades ago, IVC has become especially useful the last few years for instructing preservice candidates. For example, through virtual field experiences, special education courses come alive as preservice candidates have access to special education teachers interacting with their students in public school classrooms (Smith, 2003).

Candidates can also have routine, virtual field experiences in classrooms that provide a diverse and multicultural perspective that they may not otherwise encounter (Lehman & Richardson, 2007; Phillion, Miller, & Lehman, 2005). Cybermentoring has also been found to be effective. This involves using interactive video while classroom teachers and university faculty mentor preservice teachers tutor K–12 students in co-teaching situations (Johnson, Maring, Doty, & Fickle, 2006). Virtual field trips using interactive video, where a connection is made to a remote location to learn more about the site or engage in a planned activity, have also been explored (LeBlanc, 2002; Pachnowski, 2002). Exploration is also being carried out with IVC regarding field supervision, where the university supervisor can observe a candidate and have a postteaching conference while eliminating travel time (Pemberton, Tyler-Wood, Cereijo, Rademacher, & Mortensen, 2001; Sharpe, Hu, Crawford, Gopinathan, Moo, & Wong, 2000; Smith, 2003).

Although there have been numerous opportunities for using interactive video, the following project is uniquely geared toward exploring the use of interactive video while learning effective methods of teaching reading to elementary students. Through IVC, preservice candidates experienced interactive field experiences. It was through these interactive experiences that the faculty focused candidates on purposeful observation, guided reflections, and the opportunity to discuss the lesson with the classroom teacher to further strengthen the link between theory and practice.

The IVC Project Evaluation

Administrators and faculty members in the College of Education at the University of South Alabama began exploring possible uses of IVC technologies beyond distance learning opportunities. It soon became apparent that IVC technology could be used as a teaching tool to enhance instructional opportunities. As a result, a new dimension to a partnership developed between university and a local school district to explore the usefulness of IVC technology in improving staff development and preservice teacher preparation. Through a college incentive grant written by one tenure track assistant professor and one instructor of the reading method's course, the university demonstrated its commitment to this newly developed partnership by purchasing IVC systems to be used inside classrooms in the local school district. In return, the school district provided the

needed high-speed Internet connection, the bandwidth for the Internet connection, and the support necessary to get through existing firewalls.

Program implementation was possible because of a partnership established between undergraduate elementary reading methods faculty in the college of education and a group of recognized "effective teachers" of reading in the school district. The school district reading supervisor and local school reading coach's informal classroom observation and the school principal's formal observations using the district's observation instruments aided in the identification of these effective teachers of reading. The initial program began with one second grade classroom teacher during a spring semester. The program was expanded during the following academic year by adding a first grade teacher and a fifth grade teacher. One teacher selected was a graduate of South Alabama's reading specialist program. Another teacher selected was a former reading coach who was identified as an excellent teacher of reading by district personnel. University reading researchers involved in the project considered all of these factors while identifying these teachers for modeling researched-based best practices in the teaching of reading.

Throughout the course of the 2-year evaluation, three elementary classrooms used three cameras. This provided preservice candidates opportunities to engage in lessons in a variety of classroom settings across varying grade levels. IVC provided a practical way for a common experience for all preservice candidates, ensuring that the model teaching met the standards that educators want new teachers to internalize and emulate.

The Interactivity of the System: The Users' Viewpoint

After the IVC system was in place in classrooms, key features made the technology very powerful. First, interactive exchanges between sites were possible. The students could both see and hear participants at both the near and the remote locations. Second, the system allowed for control of the camera from the remote locations, including panning and zooming. Third, the video screens could be split to display external content at the near site while allowing the remote site to be interactive with voice and video. Finally, the technological potential could be enhanced with the picture-in-picture feature at both the near site and the remote sites.

Rationale

Given that substantial evidence suggests that improved teacher quality is directly linked to student success, researchers theorize that preservice candidates should receive extensive field experiences under the guidance of excellent mentor teachers. In this way, research shows that preservice candidates would be more capable of applying their positive learning experiences to the implementation of effective teaching methods once they begin as new teachers in their own classrooms (Greenwald, Hedges, & Laine, 1996). Allington (2003) states that students of effective teachers have higher student achievement regardless of factors such as program materials utilized or pedagogical approach. If this is true, effective programs to mentor and induct preservice teachers into the profession at the university level are a necessity. However, many universities find it difficult to locate a sufficient number of effective teachers who implement current research-based teaching strategies. This results in some preservice candidates observing instruction that might contradict current reform efforts, which makes it difficult for the candidates to connect university learning to teaching practice (Barnett, Harwood, Keating, & Saam, 2002).

With these concerns in mind, and the belief that teaching reading is arguably one of the most difficult subjects to teach, the need to find excellent reading teachers to model best teaching practices became evident. Because there is no single best way to teach all children to read, many teachers follow scripted programs, whereas others gather their own resources, and still others use a blended approach. Therefore, it is often difficult to locate a sufficient number of reading teachers who implement instruction that focuses on meeting the needs of all students through research-based teaching strategies. It is the philosophy of the reading professors at the University of South Alabama that effective teaching begins with assessing students' reading abilities and using the assessment results to plan appropriate instruction for each student. They also believe that the teachers should tailor the materials and resources they use to meet the needs of the students in the classroom. It was through these concerns and beliefs that the need for IVC became evident. Specifically, IVC with a classroom teacher who exemplifies excellence in reading instruction is one way to enrich the preservice candidates' learning experiences and provide them with excellent models of reading instruction.

At present, universities around the world have used various applications of similar technological resources to enhance their preparation of preservice teachers. However, we found little research that directly relates to the use of IVC in reading instruction among lower socio-economic schools. Therefore, based on Allington's premise and the need for additional IVC research, the researchers created a program involving the use of a Polycom 5000 IVC unit in conjunction with an undergraduate reading methods course. The major purpose for implementing this program was to examine to what degree technology may be used as an aid in university instruction to help preservice candidates connect theory with practice and, specifically, to what degree preservice candidates will find the use of IVC helpful in applying university-learned teaching strategies to the development and utilization of their own effective teaching habits as new teachers.

Evaluation Questions

Researchers were interested in finding information to determine possible answers to the following questions concerning preservice teachers' perceptions of the usefulness and implementation of IVC:

- How did the use of IVC aid in the preservice candidates' conceptual understanding of research-based, best practices in reading?
- Did participating in IVC strengthen preservice candidates' ability to teach research-based best practices in reading?
- To what degree did the preservice candidates find the following processes helpful?
  - Set-up of lesson prior to viewing
  - Viewing the lesson
  - Use of Listening/Viewing Guide
  - Debriefing with classroom teacher
  - Debriefing with university faculty

Participants

This study took place over the course of three semesters. All participants were in the first semester of their senior year and enrolled in four methods courses. Upon first implementing the program during the spring semester of 2006 (Year 1), there were 48 total participants, 47 of which were female and 1 of which was male. Of these participants, 41 were Caucasian and 7 were African-American. During the fall of 2006 (Year 2), 63 candidates participated in this study. Of these participants, 60 were female and 3 were male; 49 were of Caucasian decent and 14 were African-American. During both the spring and fall semesters of 2006, no other nationalities were reported and/or represented as having participated in the study. In the spring semester of 2007 (Year 2), there were 102 participants total, including 98 females and 4 males. Of these participants, 79 were Caucasian, 22 were African-American, and 1 reported their nationality as "other." During all three semesters, each participant received the same daily schedule. Candidates were to attend formal education classes at the university on Mondays and Wednesdays of every week and were to be in the field every Tuesday, Thursday, and most Fridays from approximately 8 a.m. to 2 p.m.

Using IVC

During each semester of the program's implementation, preservice candidates received professional instruction concerning research-based best practices in reading. In addition, the university provided instruction on the theory and foundation of reading, followed by the use of IVC to provide a common experience for all candidates as they observed modeled lessons taught by effective teachers. These lessons featured several key instructional components that promote the active engagement of students during typical school days. These instructional components included administering and analyzing assessments and using the information to differentiate instruction for all students, using a variety of materials and resources to address students' needs, as well as engaging students in meaningful literacy activities. IVC was used to observe and reflect on reading instruction in first, second, and fifth grade classrooms in nearby schools.

Set-up of the lesson prior to viewing. Prior to the lesson viewing, the faculty taught specific elements of teaching reading. Thus, they established the focus of a particular IVC session based on university teaching. After initial conversations with the classroom teacher, the university faculty would describe the lesson the candidates were going to view. The faculty would provide an awareness of specific elements of the lesson that would lend to purposeful observations.

Viewing the lessons and using the Listening/Viewing Guide. The preservice teachers engaged in IVC sessions once every 3–4 weeks during the semester. Most often, the three sections of the reading methods course would meet in a small auditorium and view the IVC session together. This took place through collaboration with other methods faculty members or on scheduled whole-group seminar days. On rare occasions when the schedule could not be orchestrated so that all students saw the same teacher at the same time, the sessions took place with one section only but were videoed and shown to the remaining students at a different time.

The sessions alternated between grade levels, depending on what was being taught in the university classroom and the logistical schedules of the classroom teachers. In each situation, the professor and classroom teacher(s) established prescheduled times. The cooperating elementary school teacher made a phone call to the university classroom using the IVC technology. The reading faculty member answered the IVC call. After a brief "hello," the classroom teacher began teaching class.

During this time, the participating university faculty provided guidance to preservice candidates regarding important elements to notice as they observed, reminding participants to make notes on their Listening/Viewing Guide. The guide contained questions to remind the participants of the specific lesson elements they were to be looking for as well as any questions that arose as they were watching the lesson. In addition, the professor controlled the camera, focusing attention to key features of the lesson, such as students and teachers' specific behaviors, the materials used, and the organization and management strategies implemented.

Debriefing the lesson with the classroom teacher and university faculty. Powerful dialogue took place between the university participants and the classroom teacher. However, the faculty took into account the number of questions the preservice candidates permitted in order to minimize classroom disruptions and protect instructional time in the classroom. Following each modeled lesson, each IVC session was debriefed at the university. Debriefing began with discussions, in small groups or with partners, in which each preservice candidate shared his or her perception of the conference with group members. Follow-up included a whole-group share to help participants synthesize and internalize what they had viewed.

Methodology

The purpose of this study was to evaluate the effectiveness of IVC in enhancing preservice teachers' knowledge and ability to implement effective reading instruction. IVC sessions took place either in an auditorium of approximately 100 candidates or in a classroom of approximately 30 candidates. Prior to the first IVC observation, the participating professor from the

University of South Alabama informed candidates about school demographics, the grade level, and the type of reading lesson they would be observing. We gathered data at the conclusion of each scheduled IVC session based on the university candidates' Listening/Viewing Guides that they completed during the interactive video process; whole-group and focus-group discussions; and electronic surveys that included multiple-choice questions based on a Likert response scale and open-ended questions that required participants to write narratives about how the experience affected their knowledge and ability to implement research-based best practices in reading. We analyzed qualitative and quantitative data and used it to address research questions 1 and 3, and we used the electronic survey data to address research question 2.

Listening/Viewing Guides

Participants were asked to complete a Listening/Viewing Guide while watching the modeled lesson via IVC. Candidates were specifically asked to identify and record the various teaching points of the lesson as well as any questions or thoughts that came to mind while viewing the teacher's instruction. Candidates were also instructed to identify and note any specific elements that they found to be of great significance in terms of the lesson itself, the public school students involved, and/or the teacher modeling it. Following each IVC session, each candidate's completed guide was used as the basis for whole-group and/or focus-group discussions.

Group Discussion

Whole group. At the completion of each modeled lesson, participants had 15–20 minutes to participate in a guided discussion with the classroom teacher based on notes gathered from the Listening/Viewing Guides. University faculty facilitated this communication. Following the conversation with the classroom teacher, the university faculty member continued debriefing the lesson with the participants.

Focus groups. Following the whole-group conversations, the faculty member placed the participants in focus groups of five to six people to discuss specific methods used during the lesson to teach reading. Each group designated a group leader and a group recorder who was assigned the task of documenting conversation details. The faculty facilitator asked participants to record on the back of their Listening/Viewing Guides any additional information they deemed to be of particular importance and to use the guides as their basis for focus-group conversation. The researchers collected all recorded information and notes following each session.

Electronic Data Collection

The reading faculty involved in this research developed an electronic survey to elicit feedback from preservice candidates regarding the Methods of Teaching Reading course. The survey contained four questions specifically relating to IVC: two multiple-choice questions based on a Likert scale and two questions that required open-ended responses (see Appendix A, page 20). These questions were designed to explore the preservice candidates' overall perceived benefits of the implementation of IVC in the Methods of Teaching Reading Course. During the course of this study, the researchers administered the electronic survey at the end of each semester.

As part of the data analysis, it was the researchers' intent to bring order, formation, and meaning to the data collected. This was accomplished by establishing links between the varying data in varying contexts in order to establish themes. The themes included: the power of the candidates being able to actually see best practices in action, the candidates' belief that they would be better able to implement research-based best practices because they saw them modeled, and the contribution that each component of the overall videoconferencing session made to the candidates' positive perception.

Discussion of Results

Results from the data suggest that many candidates appeared to make connections between what they observed directly in the field and what they observed during the IVC. They were able to identify both the common traits and the existing differences between the two and to determine what makes the art of teaching powerful for each individual. IVC seemed to be useful for helping preservice candidates learn how to teach specific literacy components and increase their capacity to plan for the successful implementation of important teaching components, such as classroom organization and management and the use of differentiated instruction to help meet the needs of diverse learners.

This section presents specific data and discussion in relation to each research question. The first research question was: How did the use of IVC aid in the preservice candidates' conceptual understanding of research-based best practices in reading?

During the first semester of the program's implementation, one second grade teacher was involved in the IVC. Thirty-four of the 48 participants responded to survey questions about the use of interactive video. Of these respondents, 91% reported feeling that the use of IVC helped to increase their knowledge of teaching reading and their ability to implement specific reading strategies.

Year 2 involved two semesters and two IVC classroom teachers. Eighty-eight of the 165 participants responded to survey questions about the use of interactive videoconferencing. Ninety percent of the respondents reported that they felt the use of IVC increased their knowledge of teaching reading. Specifically, the participants indicated that viewing a lesson while an effective teacher was teaching seemed to be one of the most beneficial aspects of the course itself.

Following are additional candidate comments supporting the use of IVC to help develop preservice teacher knowledge for teaching reading:

> Although I didn't get to see the different reading strategies implemented in my field experience, I did

Table 1. Perceived Benefits of IVC Based on Participant Responses about the Setup of the Lesson

Year	Not Helpful	Somewhat Helpful	Extremely Helpful	Example Comments*
Year 1	0%	50%	50%	"Knowing what to look for in each lesson helped me to maximize the IVC experience."
Year 2	2%	57%	62%	"I find having an instructor orally "set up" the lesson helps me get a feel for what the focus of the lesson is going to be, and what the teacher has been working on prior to this lesson."

Table 2. Perceived Benefits of IVC Based on Participant Responses about the Viewing of the Lesson

Year	Not Helpful	Somewhat Helpful	Extremely Helpful	Example Comments
Year 1	6%	32%	62%	"It [IVC] is more effective for you to watch someone teach a lesson than to have someone tell you how to teach a lesson. Modeling is more effective than hearing 'how to.'"
				"It gave me the opportunity to see a lesson from the beginning to the end. It was a great model for me to do my lessons by."
Year 2	2%	17%	81%	"I think that the interactive videos helped because it showed an effective reading teacher using effective reading strategies in order to teach her students. Also it gave me a little more insight or experience within the classroom."

> get to see them in the videoconferencing. This helped me to see how to do them the correct way and how it benefits the students.
>
> I think that the interactive videos helped because it showed an effective reading teacher using effective reading strategies in order to teach her students. Also it gave me a little more insight or experience within the classroom.

Rather than reading or learning about good teaching strategies from a book or lecture, it seems that preservice teachers found it more helpful to see what effective teaching skills look like as they viewed excellent teachers firsthand. In addition, many instructors often model strategies or show videos. Using IVC was more effective for this group of preservice teachers because they were able to see these strategies in action with students similar to those they were teaching in their field experience. These data demonstrate how IVC may be used to provide candidates with additional opportunities to observe and learn how to teach specific literature components, thus increasing the conceptual understanding of the teaching of reading.

The second research question was: Did participating in IVC strengthen preservice candidates' ability to teach research-based, best practices in reading?

As determined by preservice candidate comments on open-ended questions, focus groups, and Listening/Viewing Guides, it may be concluded that participation in the IVC program seemed to result in candidates who believed themselves to be more thoughtful and reflective practitioners of reading instruction. For example, one candidate had this to say on the survey after having participated in the program:

> After watching the reading teacher in a real classroom with real students I gained a better knowledge…. I now better understand what is expected out of these lessons, and how I will use them in my future classroom to enhance my students learning to be life long learners and readers.

This response further demonstrates how IVC may be useful as a tool for helping preservice students to become more knowledgeable and skilled at the art of providing reading and writing instruction to developing students.

In addition, a Year 2 candidate stated in a focus group:

> It was really helpful when I wrote and taught my lessons. It was much better than just discussing these lessons in class.… I think that it would be beneficial to also see science, social studies, and math lessons this same way.

Thus, as an added benefit, it seems clear that candidates felt that the benefits of IVC may extend beyond the scope of just reading instruction.

The third research question was: To what degree did the preservice candidates find the following processes helpful: (a) set-up of lesson prior to viewing, (b) viewing the lesson, (c) use of Listening/Viewing Guide, (d) debriefing with the classroom teacher, and (e) debriefing with university faculty.

Setup of Lesson Prior to Viewing

It may be postulated that undergraduate preservice teachers may not know what to "look for" as they are making observations in a classroom. As evidenced by the data, the candidates realized the importance of purposeful observation (see Table 1). Helping them focus on the specific elements of each lesson that made the lesson effective in meeting the needs of the classroom students was critical in the overall effectiveness of IVC.

Viewing the Lesson

IVC allowed candidates to watch exemplary teachers implement research-based best practices in reading instruction in classrooms with similar populations to those where they were completing their field experiences and where they would likely obtain teaching positions. More than 90% of the candidates in Years 1 and 2 found viewing the lesson helpful in some capacity (see Table 2). Those who did not find the lessons helpful reported they were seeing these practices in their biweekly field experiences and did not find the additional observations through IVC helpful.

This data is arguably the most critical, as the centerpiece of this use of IVC is watching a master teacher model a

lesson with students. Though the teachers likely prepared the students in the classroom in some way, the lessons were unrehearsed and unedited in terms of the daily life in the classroom. This aspect made the modeling piece much more dynamic than a prerecorded video or an instructor modeling at a university without the benefit of children with whom they worked with daily.

Use of Listening/Viewing Guide

Based on responses regarding the IVC component of the use of Listening/Viewing Guides while participating in IVC, the preservice teachers found that the guides were valuable for recording and reflecting upon what they saw, which methods seemed to work, and which methods seemed less helpful. Approximately 80–85% of the candidates found the guide a useful tool, whereas approximately 21% and 13% did not (see Table 3). It stands to reason that not all students would find a note-taking device beneficial. However, considering the mental engagement required to watch something, process it, and write notes, it can be postulated that the use of the guide facilitated candidates' active attending to the IVC session.

Table 3. Perceived Benefits of IVC Based on Participant Responses about Using the Listening/Viewing Guide

Year	Not Helpful	Somewhat Helpful	Extremely Helpful	Example Comments
Year 1	21%	50%	29%	"I am a note taker by nature, so using the viewing guide really helped me to watch carefully and make notes on the important points or on questions that I had as I was watching each lesson."
Year 2	13%	35%	53%	"The Guide that we used during each IVC session helped me to stay focused on the lesson and be able to ask questions after the lesson."

Table 4. Perceived Benefits of IVC Based on Participant Responses about Debriefing with the Classroom Teacher

Year	Not Helpful	Somewhat Helpful	Extremely Helpful	Example Comments
Year 1	9%	38%	53%	"The benefits from using interactive video were lots of modeling and the ability to ask the classroom teacher questions."
Year 2	7%	38%	56%	"The classrooms chosen for the video were very helpful. They showed me areas that I did not see in the field. The teachers in the video were more knowledgeable in some areas than my cooperating teacher, so talking with them was very helpful."

Table 5. Perceived Benefits of IVC Based on Participant Responses about Debriefing with the University Faculty

Year	Not Helpful	Somewhat Helpful	Extremely Helpful	Example Comments
Year 1	3%	41%	56%	"[Being] able to discuss with our faculty was helpful since she was so familiar with each classrooms set up and knew the teacher so well. She [the faculty] had more background knowledge on the teachers than I would have thought and that was helpful!"
Year 2	2%	31%	68%	"I also greatly benefit from having an instructor debrief the lesson. This helps me in my own planning."

Debriefing with Classroom Teacher

The data illustrate that the IVC component of debriefing with the classroom teacher was an effective process (see Table 4). This element was critical to the IVC process, as the aspect of the candidates being able to immediately interact with the classroom teacher was a large part of the defining difference of IVC compared to other forms of teacher modeling for university candidates. More than 90% of respondents indicated that they found the debriefing with the classroom teachers helpful. The candidates enjoyed being given the opportunity to ask the teacher they were viewing questions, and this privilege seemed to add meaning to what they had observed. The candidates realized a certain degree of knowledge and expertise the teachers had regarding the teaching of reading and were able to ask clarifying questions regarding lesson elements and other classroom aspects, such as the classroom management and organization in relation to the teaching of reading.

Debriefing with University Faculty

The candidates' responses indicated that receiving insight by their university faculty member was an added benefit, as she could point out important aspects of the IVC and/or provide further explanation or detail when it is needed (see Table 5). The university faculty member was able to help students learn from particular situations that they may not have noticed otherwise. In some cases, the candidates felt more comfortable discussing the lesson with the university faculty due to the previously established relationship and community in the university classroom.

Appendix B (page 21) presents example responses regarding whole-group and focus-group conversations, and Viewing Guide notes about how viewing elements of comprehensive reading helped the participants connect theory with practice.

Unanticipated Benefits

Though the primary purposes of IVC in this study were to provide exemplary models of the teaching of reading to all preservice candidates and for the candidates to reflect on those practices and envision themselves teaching reading in a similar manner, there were additional benefits to implementing IVC that were not originally intended. For example, one student reported, "It is real life. The students and the teacher were not actors. I saw how 'good' classroom management skills can make the difference in a classroom, which makes the difference in the students' opportunity to learn."

This candidate's comment reflects a positive unanticipated benefit of the use of IVC. In this case, she observed effective classroom management strategies. IVC provides the structure for candidates to

do this under the direct supervision of a university supervisor.

Another candidate said, "The videos allowed us to see what type of instruction takes place in an effective classroom. The video also shows how the teacher adapts to meet every child's needs, and I think that this is extremely important."

IVC may be used to highlight the importance and the usefulness of differentiated instruction within a classroom.

Still another unintended benefit is reflected in this candidate's comment:

> I was able to get a firsthand look at an experienced teacher. I was able to get ideas as to how to set up my classroom. The teacher that I witnessed showed me how to properly manage a classroom along with how to teach reading by using different methods.

This candidate seemed to notice that viewing an IVC provided a unique opportunity to learn and apply valuable information and insight concerning classroom organization, classroom management, and differentiated instruction. All of these benefits ultimately have an impact on student achievement. Both the intended and unintended benefits make carefully planned interactive videoconferencing sessions with intentionally selected teachers a powerful tool for demonstrating excellent instruction in classrooms that are exemplary.

Implications

The evaluation of the program data indicates that preservice teachers may benefit from many varied experiences. These experiences lead to preservice candidates feeling knowledgeable and competent to implement innovative teaching practices. Though deep, rich, extensive field experiences are necessary and arguably irreplaceable, they may not be sufficient. During these field experiences, some teacher education candidates will observe the implementation of best practices that they should emulate and have structured opportunities for reflection. However, others will observe practices that should not be replicated, and they may also not have the opportunity to engage in thoughtful and reflective conversations with the cooperating teacher or university supervisor regarding their observations.

This evaluation suggests that through the use of IVC, the university professor may ensure the modeling of best practices through careful selection of the teacher and can guide the candidates in thoughtful, purposeful observation and conversation, both before and after the lesson. The candidates may also have an opportunity to converse with the classroom teacher about lesson specifics and other classroom observations. The university candidates may concurrently develop a connection to the public school classroom, and the participating students could be selected based on similar populations with whom the candidates will be teaching.

Though there are obstacles to consider when implementing IVC, without a doubt, teacher education programs would benefit from examining the use of interactive video with preservice teachers in all content areas. When considering the impact of quality teaching on student learning, providing preservice teachers with the knowledge and opportunity to see exceptional modeling through field experiences and/or IVC, followed by the opportunity to practice using these powerful teaching strategies and reflect on their learning in all content areas, is worth the effort.

Additionally, educators could benefit from research conducted not only using perceptions of preservice teachers, but also collecting and analyzing data from lesson observations conducted by the university supervisors that indicate if candidates are better able to implement specific teaching strategies after engaging in the interactive video process. Countless other uses of interactive videoconferencing may also be explored to potentially assist preservice and inservice teachers in accomplishing their ultimate goal: preparing teachers to better meet the needs of today's students.

Though various reform efforts are needed, using technology to help better prepare preservice teacher education candidates should be considered central to the restructuring of teacher education programs. It may be surmised that IVC is a powerful tool that teacher education programs can utilize to help prepare new teachers to meet the many challenges inherent in educating students today. The solution is quite complex and undoubtedly requires time and effort. Future research may expand upon the present study by examining the usefulness of IVC when training candidates to teach other content areas. Ultimately, based on the findings of this project evaluation, it can be postulated that effective use of IVC technology in preparing preservice teacher education candidates may be an integral part of the solution.

Author Notes

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Appendix A

This is an excerpt from a survey administered to the students enrolled in the Methods of Teaching Reading course. The entire survey focused on various aspects of the course that were unrelated to this evaluation.

Interactive Videoconferencing Survey

23. Did viewing the implementation of the elements of comprehensive reading in a real classroom, with real students, help increase your knowledge of how to connect your learning to actual teaching?

Yes No

24. If you answered YES to the previous question, please indicate how you think this will happen.

25. Indicate the rating that best describes your opinion regarding the benefits of each of the components presented:

(Not Helpful/Somewhat Helpful/Extremely Helpful)

Orally "setting up" the lesson prior to viewing

Viewing the lesson

Having a Listening Guide to make notes on

Debriefing with the classroom teacher

Debriefing with instructors

26. Overall, what do you view as the benefits from using interactive video?

Appendix B

Comments Relating the Connection of Theory to Practice

"Watching the lessons will help me as a teacher because it allowed me to see the best, most effective way of teaching different reading lessons."

"Viewing the conferences in the classroom helped because it showed me how to use these strategies in the classroom."

"I think that this [videoconferencing] will help because being able to see reading lessons that I did not see in person, such as reading conferences, makes me more comfortable to be able to implement them in my own classroom. Seeing all of these reading lessons and knowing that this teacher uses them on a daily basis makes me feel that I can successfully implement them in my own classroom on a daily basis."

"It allowed us to see exactly how the various components are integrated into the curriculum. It was good to see a real example instead of just hearing how they work and reading about them."

"Being in a real classroom setting helped me to realize how to identify a struggling reader and how I can help the struggling students by providing great reading strategies."

"It [IVC] allows you to actually see how it should be done. It does not leave room for misunderstandings when someone is showing you how to implement the strategies."

"I got to see first hand at how it [teaching reading] is done in the real classroom. The information was not just taught to us, we actually got to see it happen."

"The interactive videos helped somewhat—it was nice to see the lessons taught."

"I think the benefits from using the interactive video was getting a chance to see something taught in the live classroom and having a chance to ask questions about the things I did not understand."

"Using the interactive video helped me see how we use what we talked about in the classroom setting."

"This is a great way to show students how the concepts learned in class can be applied in the classroom. Also, it is nice to see the new technology available."

"I think it was more beneficial to me because I was able to see the elements of reading instruction in a primary level classroom, which I had little experience in prior to this program. I was also able to see how other teaching strategies were used in the classroom as well."

"I took back what I had learned from the conferences to my cooperating teacher and we applied it in our classroom."

"It is much more effective than a textbook, and it shows us how it is done in a real classroom setting."

"I was able to get a first hand look at an experienced teacher. I was able to get ideas as to how to set up my classroom. The teacher that I witnessed showed me how to properly manage a classroom along with how to teach reading by using different methods. Viewing the guided reading lesson was very helpful to me because it was not done in my cooperating classroom."

"Videoconferencing helped make the connection from theory to application. It was great to see a teacher actually using the concepts we were taught. I will be much more likely to use these strategies in my classroom."

"I think that it was extremely helpful. I was teaching in the fifth grade and I would have liked to been able to see a few more lessons taught live. We did watch some samples in Mrs. Simpson's classroom, but for some reason I just couldn't stay focused like I could when I knew that I watching someone teach live."

"I find having an instructor orally "set up" the lesson helps me get a feel for what the focus of the lesson is going to be, and what the teacher has been working on prior to this lesson. I also greatly benefit from having an instructor debrief the lesson. This helps me in my own planning."

"I found that interactive video was a wonderful way to view teachers teaching in a real setting. We were able to not only see how the teachers introduced the lessons but also how they dealt with problems that arose during the lesson. I felt that having this additional experience helped me to have a broader view of how to be a good and effective teacher."

"I was able to get a first hand look at an experienced teacher. I was able to get ideas as to how to set up my classroom. The teacher that I witnessed showed me how to properly manage a classroom along with how to teach reading by using different methods. Viewing the guided reading lesson was very helpful to me because it was not done in my cooperating classroom."

"Watching the conferences lets you know that you don't have to teach reading out of a basal ever."