January 2019

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Recommended Citation

Dixon, Raymond A.; Hall, Cassidy; and Shawon, Farjahan (2019) "Using Virtual Reality and Web Conferencing Technologies: Exploring Alternatives for Microteaching in a Rural Region," *Northwest Journal of Teacher Education*: Vol. 14 : Iss. 1 , Article 4.
DOI: <https://doi.org/10.15760/nwjte.2019.14.1.4>

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Using Virtual Reality and Web Conferencing Technologies: Exploring Alternatives for Microteaching in a Rural Region

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Preservice teachers' views of two types of technologies which provided realistic environments in which to practice microteaching are described: (1) TLE TeachLivE™ Lab, a virtual reality environment that employs avatars as students in a virtual classroom, and (2) web conferencing technology to synchronously teach students in remotely located classrooms. Preservice teachers opined that each technology offers a relatively realistic environment that allows them to interact with virtual and real students. Microteaching through these technologies increases their self-confidence and provided a safe, non-threatening environment for them to reflect on their practice. We concluded these emerging technologies can provide viable alternatives to bringing classroom realism for preservice teachers to practice their teaching skills.

Keywords: TeachLivE™, web conferencing, microteaching, preservice teachers, virtual reality, co-teaching

Introduction

Providing authentic teaching experiences for preservice teachers in rural regions can present several challenges. Logistically, some school districts are located in remote areas making it difficult for preservice teachers to be placed in these schools. The burden of accommodating preservice teachers for practicum usually falls on schools that are in closer proximity to the training university. Over time, the mentor teachers at these cooperating schools may feel

overstretched by the large number of preservice teachers they are asked to supervise and the demand it makes on their already limited time. This problem is compounded when these schools are required to accommodate additional preservice teachers who are in their senior year and have to complete a longer internship. Faced with these challenges, a teacher training program at a university in the Inland Northwest explored alternative ways to expose preservice teachers to authentic teaching. This study describes how virtual and web-conferencing technologies were used in microteaching exercises in general methods classes to increase the level of authenticity of their teaching practice.

Teaching Practicum Issues

Preparing preservice teachers for internship by giving them sufficient exposure to teaching in authentic environments is not without challenges, but ethical professional practice dispels the notion of *trial by fire*, expecting preservice teachers' first teaching experience in a real classroom to be during their final year internship. As articulated by Spelman and St John-Brook (1972), theoretical lectures in the average teacher training program deal with philosophical, historical, and psychological foundations of education and are often far removed from the real experience of the classroom. Often the results are as expressed:

In this system, student teachers are assigned to practice schools near the training institute or university. All too often the student's inexperience and anxiety, coupled with his inability to translate theoretical precepts into practice, may cause him to take as his model the teacher to whose class he is assigned irrespective of the qualities of that teacher, or alternatively, to model his performance on recollections of dominant teacher-figures from his own schooldays. (p. 74)

Therefore, giving preservice teachers as many opportunities as possible to practice teaching before entrance into the real classroom during their internship is critical to reduce, if not eliminate, a modeling tendency of preservice teachers described by Spelman and St John-Brook (1972).

Along the same line of reasoning, Jones and Ryan (2014) indicated that preservice teachers' exposure to authentic teaching is "also one of the aspects of teacher education that falls under much criticism due to its tendency to be disconnected from the theoretical, university-based components of teacher education courses..." (p. 133). Often, preservice teachers do not have the opportunity to practice substantial teaching until they are involved in their internship at schools away from their college or university. Bridging the theory-to-practice gap, however, necessitates that student teachers receive as many actual teaching exposures as is practical during their methods classes. It is not sufficient

for preservice teachers to learn to write appropriate lesson plans; they must also have ample opportunity to teach and reflect on their teaching in order to develop their confidence in teaching. Critical to this process is the opportunity to experiment with one's own practice in an environment where "judgment and assessment are minimized in order to encourage risk taking so that strong personal learning might be experienced" (Loughran, 2006, p. 161).

The Framework: Microteaching

A series of immersive events targeted at progressively developing preservice teachers' confidence in teaching is essential before the preservice teacher begins an internship in a school. When preservice teachers perceive an experience as successful, especially when a difficult task is surmounted with little assistance or is achieved with few setbacks, their sense of confidence will increase (Bandura, 1997; Martins, Costo, & Onofre, 2015; Tschannen-Moran, Hoy, & Hoy, 1998). This suggests that preservice teachers must be given the opportunity to be successful in teaching before they are required to teach alone in schools where they are assigned to do their practicum. This type of practice can be in the form of microteaching of their peers, or some other format.

Microteaching is a teacher training technique designed to instill teaching skills. It employs actual teaching situations to help students develop a deeper practical knowledge of the art of teaching. Microteaching can be practiced with a short lesson or a single concept and with fewer students. It was designed "as a brief but structured practical experience in which prospective teachers would begin to bridge the theory-practice gap by planning and presenting a 5- to 10-minute lesson, in which they were to apply specific instructional skills or tasks previously studied in class" (Ralph, 2014, p. 17). It scales down the complexities of real teaching, and immediate feedback can be sought after each practice session (Spelman & St John-Brook, 1972; Allen & Eve, 1968). Microteaching in a general methods course may take the form of preservice teachers instructing their classmates. While such an approach has several stated advantages, a limitation is that the simulated classroom varies from the context in which the preservice teachers will be teaching during internship. In addition, performing before their peers can be stressful, peers can be insensitive to each other, and students may not transfer skills into practice because of the dissimilar context (Ralph, 2014; Higgins & Nicholls, 2003). In view of this limitation, we explored ways in which we can use technology to increase the level of realism during microteaching, and at the same time, allow preservice teachers to practice in a non-threatening environment that reduces anxiety and fosters freedom from the fear of making mistakes. Two types of technology were explored: Virtual Reality (VR) and Web-conferencing.

Virtual Technology

Advancements in 3D Virtual Reality (VR) technology offers new potential to provide preservice teachers with laboratory-based teaching practice sessions (Hu-Au & Lee, 2017; Myers, Starrett, Stewart, & Hansen-Thomas, 2016). According to Huang, Rauch, and Liaw (2010, p. 1171), “VR technology has been successfully employed in educational applications and is at the core of what is known as Virtual Reality Learning Environments (VRLE).” VRLEs provide an interactive environment that reinforces the sensation of immersion into a computer-generated virtual world. It contains avatars and three-dimensional computer graphics that mimic the real world and simulate a realistic and safe environment for learners to perform specific tasks such as teaching. Peterson (2005) defined avatars as “online manifestations of self in a virtual world, and are designed to enhance interaction in a virtual space” (p. 30).

According to Bamodu and Ye (2014), VR systems can be classified into three major categories: non-immersive, immersive, and semi-immersive. Non-immersive VR systems are conveyed commonly by desktop or laptop computers. The users’ experiences are limited to what they see on their display monitors and what they hear from their speakers (Bamodu & Ye, 2014; Mills & Noyces, 1999). Immersive VR systems give the highest level of immersion, allowing the user to feel part of the virtual environment. Its components include Head Mounted Display (HMD), tracking devices, data gloves, and other peripherals which provide the user with computer-generated 3D animation. Semi-immersive systems are hybrid systems that provide a high level of immersion, while keeping the simplicity of the desktop VR or utilizing some physical model (Bamodu & Ye, 2014; Baus & Bouchard, 2014).

Figure 1. Examples of immersion levels: (A) a non-immersive VR system, (B) a semi-immersive VR system, and (C) an immersive VR system (Baus & Bouchard, 2014).

While research and the use of VR in education is gradually increasing, Nicar (2015) indicated that VR experiences have the potential to change the way

individuals think and behave. Traditionally, VR has been successfully used for training (e.g. flight simulators), development of cultural awareness, and virtual field trips (Blascovich & Bailenson, 2011).

Web-Conferencing Technology

Using web-conferencing technology offers another opportunity to expose preservice teachers to more realistic contexts in order to practice their teaching. Synchronous virtual classrooms are commonly known as web-conferencing or e-conferencing systems (Martin & Parker, 2014; Rockinson-Szapkiw & Walker, 2009). These virtual classrooms allow students and instructors to communicate synchronously using audio, video, text chat, interactive whiteboard, application sharing, instant polling, emoticons, breakout rooms, etc. The tools allow real-time communication where multiple users can simultaneously interact with each other via the Internet to conduct meetings and seminars, lead discussions, make presentations and demonstrations, and perform other pedagogical functions (Martin & Parker, 2014). Studies at the post-secondary level indicate that synchronous virtual classrooms raise students' satisfaction (Cao, Griffin, & Bai, 2009), provide effective social interaction in education (Motteram, 2001), provide immediate feedback, encourage the exchange of multiple perspectives, and enhance dynamic interactions among participants (Park & Bonk, 2007).

Cole, Ray and Zanetis (2009) reported that opportunities are endless with interactive videoconferencing at the k-12 level. It is an economical way for educators to bring much needed supplemental materials into their lessons and curriculum. The cost of the technology has fallen while capabilities have increased and now it is more accessible to educators. With this technology, students can take field trips to otherwise unreachable places, talk to experts, and connect with their peers regardless of their physical locations. Lai and Pratt (2009) indicated that despite its technological constraints, there are pedagogical benefits to using video-conferencing technology, such as impacts on pedagogy and teaching styles and increases in teacher-student or student-student interaction. After a study exposing preservice teachers to field experiences via technology, Hixon and So (2009) concluded, "Technology may be a viable option to increase access to quality classrooms embodying types of pedagogical practices consistent with educational reform, and to encourage preservice teachers to explore new ideas in a safe environment" (p. 301). In a comparable study where preservice teachers role-played K-12 students in a virtual classroom in Second Life, participants valued the chance to be exposed to practical experiences that they would otherwise have missed due to geographical constraints (Muir, Allen, Raynor & Cleland, 2013).

Methodology

Case Study

The cases consisted of two general methods classes at a university in the Inland Northwest, the first which was offered fall 2015 and the second fall 2016. The general methods class is the first in a sequence of methods classes required by students in the teacher education program. The goal of the general methods class is to explore teaching and learning strategies for creating a culturally inclusive classroom that values diversity and supports student success. As a part of the requirement, students are expected to complete 30 hours in schools observing and co-teaching at least one topic.

Participants

Thirty-six students participated, twenty-four used TLE TeachLivE™ Lab for microteaching middle school avatars in fall 2015, and twelve used web-conferencing technology for microteaching grades 3 and 5 students at a remotely located school in fall 2016 (see Table 1). Students completed their microteaching during their regular general methods class session and before they completed their single co-teaching assignment at the school where they are completing their practicum. Students participating all have experience interacting in an online environment, and they contained knowledge of various technologies that are integrated in teaching and learning from a course offered in the teacher education program. The course includes exposure to multiple technologies for teaching and learning that are utilized both in person and in an online environment and is aligned to the Idaho Preservice Teacher Technology Standards which were adapted from the ISTE Standards for Teachers. According to Albion (1999), “Research suggests that teachers' self-efficacy beliefs about using technology for teaching are directly related to their practice” (p. 1602). With more exposure to using technology in various ways during their teacher preparation program, students will be more comfortable with using technology in their future classrooms.

Table 1
Number of Participants

	TLE TeachLivE™ <i>Fall 2015</i>	Web Conferencing <i>Fall 2016</i>
Males	7	1
Females	17	11
Total	24	12

Procedures

The Center for Innovation* leads teaching innovation and technology integration initiatives at the university and in K-12 schools throughout the state. The Center does this by supporting, teaching, modeling, and researching technology integration practices among teacher education candidates, school administration candidates, early career teachers, practicing teachers and administrators, and university faculty by providing resources, professional development, and research to state and national audiences.

Microteaching with TLE TeachLivE™.

In spring 2015, the Center introduced TLE TeachLivE™, a mixed-reality classroom with middle school simulated students, which provides teachers the opportunity to develop their pedagogical practice in a safe environment that doesn't place real students at risk. The lab is virtual, and the students in the classroom are avatars. Preservice teachers are able to interface with the virtual classroom and avatars via a large screen TV monitor and tracking devices. The virtual students may act like typically developing or non-typically developing students, depending on the objectives of the experience. Participants can interact with students and review previous work, present new content to students, provide scaffolding or guided practice in a variety of content areas, and monitor students while they work independently (TeachLive™, 2017). TeachLive™ has been used for coaching and feedback in special education and microteaching in ESL and mathematics (Brandenburg, Donehower, & Rabuck, 2014; Eisenreich & Harshman, 2014; Regalla, et al., 2014; Rodriguez, 2014).

Students completing their general methods course were assigned in groups of two or three to teach a topic of their choice to middle school student avatars. A Scenario Planner was prepared in preparation for the microteaching sessions and sent to the host of TLE TeachLivE™ to prepare the avatars. The Scenario Planner included:

- Overall description of the sessions
- Brief description of the learners (preservice teachers)
- Session learning goal
- Session objectives
- Embedded events - situations that provide the learner opportunity to develop their skills
- Contexts - such as avatars, intensity level of simulations, behavioral or cognitive profile of avatars, disciplinary content
- Participant simulated scenario
- Simulated action review cycle- facilitates reflection so learners get the most out of the experience
- Performance assessments/evaluation

- Session running order - session format

Each group prepared a lesson plan for their microteaching session. Topics taught included: *Algebra*, *Mode Mean and Median*, *US History*, *The Rock Cycle*, and *Geometry*. Each group had a practice session to interact with the avatars, learn their names, and become acquainted with the virtual environment a week before their microteaching session. The co-teaching approach used was *One Teach, One Observe* because this approach allowed each student to have equal time teaching and facilitated groups of three. It was also the most appropriate strategy because the constraints of the virtual environment and the motion sensors do not allow two students to interact with the avatars concurrently.

Figure 2. Preservice teacher microteaching with TeachLive™

Microteaching with Web Conferencing.

In spring 2016, the Center collaborated with some remote school districts to install web conferencing technology (computer, speaker/microphone system, webcam, and large flat screen on wheels) in classrooms. The aim was to use web conferencing technology to enhance collaboration and increase access to classrooms that are remotely located. A school district, located in a rural town which serves about 150 students in grades K-12 with two buildings located on the same property, was the recipient of two mobile video conferencing carts from the Center, one in the elementary school and one in the high school.

Through web conferencing, preservice teachers could observe experienced teachers instructing students in schools that are representative of schools found throughout the state but not in the local area near campus. Preservice teachers could also have synchronous microteaching exercises from their remote location at the university campus. The Zoom web conferencing application provides a

platform that unifies cloud video conferencing, simple online meetings, and group messaging. Through Zoom, preservice teachers could easily share a whiteboard, PowerPoint presentations, webpages, and videos with students in their synchronous session. Students in the rural classrooms are able to interact directly with student teachers at a distance by raising their hands to be called on (using the hand raising icon) or by typing a question into the chat window.

In fall 2016, preservice teachers co-taught lessons synchronously in their general methods class using web conferencing technology. Lessons were taught to grade 3 and 5 students at the elementary school in the aforementioned rural school district located 85 miles from the university campus. The cooperating teachers suggested topics for the preservice teachers to teach to their class, and lesson plans were prepared and sent to the cooperating teachers. Topics taught were:

- The three branches of government (Grade 5)
- Election process: National and state elections (Grade 3)
- Comparing the ways American families live today to how they lived in the past (Grade 3)

Figure 3: Preservice teachers microteaching synchronously using web conferencing technology and Grade 3 students participating.

During the microteaching sessions, an information technology (IT) specialist from the elementary school was present to set-up and monitor audio and video quality and assist with any other technologies that were used during the teaching session. The co-teaching approach used was also *One Teach, One Observe*. The classroom teachers assisted with managing students' movements and behavior, and clarifying instructions given to students when needed. A total of 12 preservice teachers used web conferencing synchronous teaching in their microteaching.

Reflection Paper.

The 24 preservice teachers who participated in microteaching using the TeachLivE™ Lab in fall 2015 were required to write a reflection paper about their experience. Similarly, the 12 preservice teachers who participated in microteaching using web conferencing technology in fall 2016 also wrote a reflection paper.

Data Analysis

Reflection papers' narratives were initially analyzed using three predefined categories (1) strength of technology, (2) limitations of technology, and (3) reflection on teaching. Narratives for each category were then analyzed and the themes that emerged from each category were coded. To ensure trustworthiness of the data, two individuals coded four papers for consistency. Differences were discussed and papers were coded again until an inter-coder reliability of 0.8 was obtained.

Results

The themes generated from the reflection papers identified several areas that preservice teachers think using these technologies as media for microteaching can enhance their experience and prepare them for internship. They commented on the realism and interactivity these technologies afford, the non-threatening environments they offer students to practice their skills, and how the process provided feedback about their teaching.

Realism and Interactivity

Preservice teachers thought that participation in microteaching and using TeachLivE™ Lab and web conferencing technology exposed them to realistic classroom environments and simulated closely the interaction in real classrooms. The avatars in TeachLivE™ and students in the remote classroom asked questions and responded to questions asked by preservice teachers, allowing them to hone their questioning techniques. All names are pseudonyms.

Shelby [TeachLivE™]: *Though, I did start to see that Maria was getting very bored, so to keep her engaged, I called on her to tell me what the rising action was for her favorite story. I spent a while defining that rising action was a series of events, not just one event, that rose towards the climax of the story.*

Ryan [TeachLivE™]: *The class seemed to be really engaged with the facts I gave and I felt more and more confident as we bounced information back and forth. Overall, the class seemed to pay attention and everyone was respectful to each other and myself. ...the class was asking really*

good questions and I wanted to keep them participating.... She (his co-teaching partner) faced the classroom the entire time and asked the class a lot of really good questions and made sure some of the questions were to assess what the students had learned.

Cheyenne [Web conferencing]: *...because it was the first time that I was able to teach in a more formal setting and was able to engage students through discussion and questioning. It was an eye-opening experience because it made me aware of the little things that it takes to maintain a classroom.*

Preservice teachers thought that through the use of TeachLivE™ technology, they were able to critically assess how they could improve their (1) teaching of a specific content, (2) interaction with students, (3) questioning techniques, and (4) classroom management techniques. With microteaching through web conferencing, they could critically assess how they could improve (1) teaching of a specific content and (2) questioning techniques. Managing the classroom and interacting with students was not difficult in this situation because they had the assistance of the classroom teacher. In addition, they expressed concern about the limitations of the technology to simulate movement in the classrooms—allowing for closer proximity, observation, and interaction with students. They were, however, willing to tolerate these areas of weakness in view of the added value these technologies gave them in developing their teaching skills.

Self-confidence and Feedback

Preservice teachers specifically referred to the microteaching exercises as increasing their self-confidence. When novice teachers are confident, then the anxieties that are associated with simply standing before a class and fielding questions will likely decrease. Post-instruction consultation with team members, classmates, and the instructor provides immediate feedback about their performance. Their perceived success in delivering a lesson that they initially thought would be challenging coupled with positive feedback from the instructor and their peers likely increased their confidence. If this confidence grows, then their internship experience will become less intimidating.

Hailey [TeachLivE™]: *I believe this will help me in my practicum because it prepared me to get some of my nerves out of the way. I know I will still be nervous, but this experience helped me feel more prepared for teaching in the classroom.*

Jillian [Web conferencing]: *I liked that we were able to work in groups and teach in two parts. It took a huge amount of stress off, but we were still able to get valuable practice. I actually liked that we were teaching younger students over the internet – the content wasn't super difficult and the young students seemed to enjoy it so much, I forgot how nervous I was initially. It improves mostly confidence and being able to speak slowly without stuttering (which I do when nervous or have to speak in front of a crowd).*

Stephanie: [Web conferencing]. *I think that this will help me get some nerves out when being in front of the class. It also made me very aware of my speaking volume.*

Non-Threatening Environment and Reflection

The non-threatening environments that the two platforms offer seem to motivate the application of teaching skills. Preservice teachers did not feel overwhelmed or guilty about any mistakes they made. They found the entire experience meaningful and enjoyable. The co-teaching format allowed team members to plan together and examine each other's teaching.

Kelly [TeachLivE™]: *This is something that will happen often in a real classroom setting, so it was nice to be able to practice that. I also liked how it was done in a very non-threatening environment so that I did not feel a lot of pressure, or like if I messed up it would be a big deal.*

Acadia [Web conferencing]: *I enjoyed being able to interact in a low stress environment with students who pose challenges for us.*

Ryan [TeachLivE™]: *Our mini-lesson with TeachLive turned out to be a lot of fun and definitely was less stressful than we had originally imagined.*

Amy [Web conferencing]: *I enjoyed working with others to plan a lesson. It was a good experience working in groups. Listening to everyone's ideas of how to teach the lesson was great. It is always great to hear new ideas that I may not have thought about before.*

Hailey [Web conferencing]: *I enjoyed this practice teaching experience because it pushed me outside my comfort zone, but I knew I still had my group to rely on if something went wrong.*

Madison [Web conferencing]: *I liked how my first experience teaching a class was with friends to rely on to help me when stuck and in a classroom I am comfortable in.*

Table 2

Areas of practice on which preservice teachers reflected after using TeachLivE™ and Web conferencing

TeachLivE™	Web Conferencing
Questioning techniques	Relating instruction to students' previous knowledge.
Proper pacing and managing time when teaching.	Proper pacing and managing time when teaching.
Classroom management <ul style="list-style-type: none"> ● setting rules ● keeping students on task ● proactive to disruptive behavior ● reaching students that show little interest in topic ● facilitating students who display strong emotions 	Speaking <ul style="list-style-type: none"> ● appropriate volume ● clearly ● expressing enthusiasm
How to improve in the teaching of a concept	Providing feedback to students <ul style="list-style-type: none"> ● Being ready to respond to students' questions ● Acknowledging students' effort ● Assessing students' understanding throughout the lesson
Vicarious experience <ul style="list-style-type: none"> ● observing peers help to reflect on appropriate strategy to use ● build confidence 	Planning lesson in collaboration with other teachers

Table 2 shows areas of practice that preservice teachers perceived each technology helped them to reflect on. Those who used TeachLivE lab and those who used Web Conferencing thought that the technologies helped them to reflect on *proper pacing and managing of their time*. There were differences, however, between both groups in other areas of their practice they were able to reflect on.

For example, preservice teachers who used TeachLivE lab thought that it helped them to reflect on their classroom management practice such as *setting rules*, *keeping students on task*, *being proactive to disruptive behavior*, *reaching students who show little interest in topic*, and *facilitating students who display strong emotions*. In contrast, preservice teachers who used Web Conferencing thought that it helped them to reflect on providing feedback to students by *being ready to respond to students' questions*, *acknowledging students' effort*, and *assessing students' understanding throughout the lesson*. A limitation of this study is preservice teachers only had the opportunity to use one type of technology in their general methods class. The authors therefore were unable to state students' perceived advantage of one technology over the other.

Discussion and Conclusion

The preservice teachers' views of using both virtual reality and web-conferencing technologies in microteaching reflected the conclusions of Ferry and Kervin (2006). They articulated that online simulation, designed to provide preservice teachers with experience in dealing with complex classroom situations associated with the teaching of literacy, provides preservice teachers with time to think critically about integrating and managing complex classroom situations to benefit their students. Online simulation allows them to engage in meaningful dialogue and negotiation, as well as utilize a range of indirect instructions such as questioning, modeling, and prompting. In terms of building confidence, Myers, Starrett, Stewart, and Hansen-Thomas (2016), explained the benefits of using TeachLivE™ Lab to enhance instruction in teacher education programs. They reported that special education preservice teachers thought:

the experience was helpful and made them more confident about preparing to do their student teaching in future semesters. In addition, several indicated that the immediate feedback, while intimidating to some, was effective in focusing their attention on specific skills (e.g., speaking to each student, responding to errors with reteaching rather than reprimands). (p. 52)

Reflecting on one's teaching or practice is an essential process for professional growth. Effective reflection includes having an accurate understanding of what went well, and what did not work in the classroom and being able to point to specific examples. This reflection is the thinking that follows any instructional event and it informs future instruction (Danielson, 2007). In the preservice teachers' views, microteaching using both technologies provided levels of authentic experiences that allowed reflection on specific events relating to questioning, classroom management, pacing of instruction, assessing understanding of students, and group planning (see Table 2). These are all critical

areas for teachers reflect on in order to improve their teaching. Teaching sessions can also be recorded, allowing students to view, assess, and critique their own teaching.

While these technologies have limitations, their strengths can be leveraged in general methods classes to provide microteaching practices for preservice teachers in their junior years. Preservice teachers point to weaknesses in both technologies, but they were consistent in their views of both technologies' potential to increase their confidence, provide an environment to make mistakes without feeling guilty or overwhelmed, and aid in the improvement of their pedagogical skills. Teacher education programs in general, and particularly those located in rural districts, can benefit from using these technologies because they potentially help to reduce the physical placement of preservice teachers in their junior years in schools, which would reduce the burden on mentor teachers who are in schools that are in close proximity to the university. At the same time, preservice teachers can have access to practice their teaching in schools that are in remote locations. There are also reciprocal benefits to rural schools—they benefit from exposing students to guest speakers, virtual field trips, and many other educational experiences that are available beyond the walls of the school without significant monetary costs.

Admittedly, administrators will have to consider the feasibility of purchasing such technologies against the cost and frequency of usage and/or the number of schools that are willing to collaborate to provide synchronous teaching with web conferencing technology. Smaller teacher education programs may find the cost of TeachLivE™ more prohibitive. Such a system can be affordable, however, if other programs within the university share cost and usage of the system because the platform's use is not limited to teacher education. As these technologies evolve, they offer opportunities to increase the realism in microteaching and provide a safe environment for preservice teachers to hone their pedagogical skills before they embark on internship.

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