1st National TLE TeachLivE™ Conference

University of Central Florida
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Reviewed and Edited by: Aleshia Hayes, Stacey Hardin, Lisa Dieker, Mike Hynes, and Charles Hughes
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TLE TeachLivE™ Inaugural Conference Agenda  
University of Central Florida  
May 23 to May 24, 2013  

Acknowledgements  

We would like to thank everyone who attended our inaugural conference for thinking differently about how we prepare great teachers. Also, our gratitude extends to all beta sites for being brave enough to play in the sandbox with us from the beginning.

Many thanks to CJ, Sean, Ed, Kevin, and Maria for inspiring us.

We also would like to acknowledge the Bill & Melinda Gates Foundation, whose gift, in part, supported the TLE TeachLivE™ team and the execution of this study. We would also like to acknowledge the work of Dr. Carrie Straub, the coordinator of the second phase of the Bill & Melinda Gates funded TLE TeachLivE™ research. Finally, we would like to acknowledge the efforts of our partner universities, whose reflections on the system facilitated development and yielded consensus to the areas of highest concern. Opinions, findings, and conclusions or expressed in this material do not necessarily reflect the views of these supporters.

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College of Education  
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SREAL (Synthetic Reality Lab) Team  
TLE TeachLivE™ Team  
College of Education Team
Foreword

The inaugural TLE TeachLivE™ Conference was a success beyond what any of us had imagined. The credit for the conference goes to the vision of two doctoral students who participated in a summer fellowship program that allowed them to become acclimated to UCF, while working across disciplines to embrace the power of collaboration as they entered their doctoral programs. Stacey Hardin, a doctoral student in special education, and Aleshia Hayes, a doctoral student in modeling & simulation, on one Monday simply said, “What do you think about having a TLE TeachLivE™ Conference?” And hence was born the First Annual TLE TeachLivE™ Conference that was attended by over 115 participants, including representatives from 2 countries and 23 universities, all focusing on the theme and vision of embracing interdisciplinary collaboration.

TLE TeachLivE™ arose out of true interdisciplinary collaboration from the shared vision of three colleagues, two in education (math and special education) and another in computer science who invested their time and energy beyond their typical job responsibilities with the dream of changing the landscape of teacher preparation. Inadvertently, the team created a disruptive innovation that could potentially impact numerous disciplines. Drs. Mike Hynes, Charlie Hughes and myself, Lisa Dieker, have for the past 8 years met at least weekly, and at times daily, to give birth to TLE TeachLivE™. However, the true vision of where TLE TeachLivE™ is today is represented in the power of this first TLE TeachLivE™ conference. The life given to the conference by two doctoral students could only occur with the contributions of a number of earlier doctoral students, with support from our beta sites who helped to launch our avatars into a new level of stardom, and with support from our own UCF colleagues, and from the generous funding provided by the Bill & Melinda Gates Foundation. The Bill & Melinda Gates Foundation encouraged and funded a convening with all of our beta sites to help set the course for the future of TLE TeachLivE™. The spirit of TLE TeachLivE™, however, is not in the technology, nor the avatars, nor the future patents, copyrights or trademarks, but the real spirit of TLE TeachLivE™ is in the power of this tool that allows people across numerous disciplines to dream and think differently about training humans (in this case teachers). The lessons to be learned about the development of TLE TeachLivE™ is that, when people leave their discipline silos and collaborate across content areas, disciplines, universities or even continents, the outcome can shift the landscape of teacher education forever. We hope you enjoy reading the abstracts of the range of ideas that are alive within TLE TeachLivE™. The articles submitted by five of the sites show the rich and deep thinking of our amazing colleagues “playing in this space” (that we refer to as sandbox technology). Thank you to all attendees and to anyone willing to take a risk to think differently in the way we impact teacher education by working together in new ways.

Lisa A. Dieker, Ph.D.
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Presentation Summaries

Utilizing TLE TeachLivE™ to Improve Pre-Service Special Education Teacher Practices

Lead Presenter: Elizabeth Whitten, Western Michigan University
Presenters: April Enicks, Daniel Morgan, & Luchara Wallace, Western Michigan University
Strand: Teacher Practices
This presentation provided results from a project utilizing TLE TeachLivE™, IRIS modules, scaffolded lesson development, in-action coaching by trained observers for TLE TeachLivE™ practicum sessions, and self-reflection. The purpose of this study was to increase the quality of the K-12 teaching force and improve the education of K-12 students.

Utilizing Virtual Environments to Address Bullying Behaviors

Lead Presenter: Kim Floyd, West Virginia University
Presenters: Chris Schimmel, Crystal Smith, West Virginia University
Strand: Teacher Practices
In this session the presenters discussed research conducted to support pre-service teachers’ skills in addressing bullying and school violence. The participants developed class rules and consequences, addressed bullying events, counseled with a bully and the target, and responded to student questions during a lock down scenario of a shooter in the building.

Exploring the Impact of Virtual Classroom Technology on Learning to Teach

Lead Presenter: Scott Sander, Miami University of Ohio
Strand: Teacher Practices
This session highlighted the use of TLE TeachLivE™ as an intervention tool within a constructivist learning environment. Findings were shared from research collected on Adolescent/Young Adult Science Methods students who utilized TLE TeachLivE™ to practice their teaching of inquiry-based science lessons of the particulate nature of matter (PNM).

Updates from TLE TeachLivE™ National Research Study

Lead Presenter: Carrie Straub, University of Central Florida
Strand: Teacher Practices
Virtual reality offers innovative ways for practicing teachers to craft their practice without placing “real” students at risk. This session explored research results of a national project using virtual rehearsal in a mixed-reality classroom in conjunction with multiple universities and school district partners. Participants learned about varying levels of professional development used for treatment, tools for data collection, and preliminary findings. Plans for year two of the study and options for collaboration were highlighted.
TLE TeachLivE™ vs. Role-Play: Comparative Effects on Special Educators’ Acquisition of Basic Teaching Skills

Lead Presenter: Melanie Rees Dawson, Utah State University
Presenters: Ben Lignugaris/Kraft, Utah State University
Strand: Teacher Practices
In this session the presenters compared the effectiveness of training sessions in TLE TeachLivE™ and structured role-play on participants' praise rate and opportunities to respond. The target skills were counterbalanced across participants and training settings. Participants in the TLE TeachLivE™ condition demonstrated higher response rates than participants in the role-play condition regardless of the target behavior. The implications of using TLE TeachLivE™ to develop basic teaching skills were discussed.

Undergraduate and Graduate Pre-service Teacher Skill Acquisition, Refinement, and Maintenance in TLE TeachLivE™

Lead Presenter: Barbara Ludlow, West Virginia University
Presenters: Melissa D. Hartley, Kimberly Floyd, Sara Aronin, Holly Devito, Matt Anderson, West Virginia University
Strand: Teacher Practices
This session described how pre-service teachers use the TLE TeachLivE™ lab for skill acquisition, maintenance, and refinement in a variety of skill areas. Skills included administering informal assessments, and using the data from the assessments to drive instructional decision-making, using effective teaching strategies, and addressing bullying and other inappropriate behaviors.

Developing Teachers Utilizing TLE TeachLivE™: Language of Instruction and Classroom Management

Lead Presenter: Kelley Lassman, Pace University NYC
Presenters: Sharon Medow, Pace University NYC; Angel Lopez, University of Central Florida
Strand: Teacher Practices
This session showcased highlights from Pace University in NYC using training materials developed to promote skill development by pre and in-service teachers using the TLE TeachLivE™ system. Phase I materials focused on teacher language of instruction. Phase II
materials were in the development and piloting phase. Phase II materials addressed classroom management skills.

iPad App for Analysis of Teaching When Using TLE TeachLivE™
Lead Presenter: Craig Berg, University of Wisconsin-Milwaukee
Presenters: Scott Ashmann, University of Wisconsin-Green Bay
Strand: Teacher Practices
In this session the presenter shared his development of an iPad App for observing teachers using TLE TeachLivE™, allowing for data collection regarding student engagement, teacher questioning and responding, use of wait-time, and patterns of teaching. The tool provides a running record and summative counts, using indicators that suggest compatibility of teaching with the intended goal of instruction.

Using TLE TeachLivE™ for Teacher Preparation in RTP³
Lead Presenter: Selma Powell, University of Central Florida
Presenters: Janet Andreason, Erhan Haciomeroglu, & Rose Taylor, University of Central Florida
Strand: Teacher Practices
This presentation highlighted how the Race to the Top funded project, RTP³, utilizes TLE TeachLivE™. Participants learned about the perceptions of the Resident Teachers that introduced a lesson to the virtual classroom and conducted a parent teacher conference with the adult avatar. Components such as coaching and feedback were addressed in the model utilized by RTP³ in TLE TeachLivE™. Components of how the second cohort of Resident Teachers will utilize TLE TeachLivE™ in 2013-14 were discussed.

Let’s Get (Virtually) Real: Learning About Classroom Management Through Simulation
Lead Presenter: Joan Walker, Pace University
Strand: Teacher Practices
Learning to manage a classroom as a pre-service teacher is challenging. Fieldwork can be limited in terms of time and access to a variety of schools and classroom situations. TLE TeachLivE™ is a promising technology for helping teacher candidates learn about the complexity of classrooms --and about themselves as classroom managers-- in a no-fault setting. This session described results of a “first day of school” management task with 71 teacher candidates.
Increasing Teacher Self-Efficacy via Teaching Inquiry-Based Science in a Mixed-Reality Classroom

Lead Presenter: Nazan U. Bautista, Miami University of Ohio
Strand: Teacher Beliefs
The researchers in this session shared a study with the audience on the present problem, study targeted, theoretical framework, methodology, explanation of the intervention, sample video-clips, findings, discussion, conclusion, and future directions of using TLE TeachLivE™. Audience feedback was sought at the end of the presentation.

Preparing Parents and Students for Advocacy Roles through TLE TeachLivE™

Lead Presenter: Nicki Anzelmo-Skelton, Southeastern Louisiana University
Presenters: Ellen Ratcliff, Southeastern Louisiana University
Strand: Proposed Innovations to TLE TeachLivE™
This session showed how parents of children with disabilities can learn to advocate and in turn teach their children how to advocate for themselves. Using Avatars as a student with a learning disability and a parent, parents practiced their advocacy skills and ultimately assisted their child with conducting his/her own IEP.

Individualized Clinical Coaching Within TLE TeachLivE™: Preparing Teachers in Evidence-Based Practices.
Lead Presenter: Krista Vince Garland, Buffalo State College
Presenter: Kevin Miller, Buffalo State College
Strand: Teacher Practices
The first part of the presentation reviewed a recent study on the impact of coaching in a virtual reality learning modality (TLE TeachLivE™), and the effects on teachers’ fidelity of implementation of discrete trial teaching when working with students who have Autism Spectrum Disorders. The study also investigated the level of transference and generalization within actual classroom settings. The second part of the presentation provided details on upcoming opportunities planned at Buffalo State for creating an innovative academic program that infuses in-vivo learning within the safety of TLE TeachLivE™ to effectively prepare and enhance teacher preparation of evidence-based practices.

AR Learning Environments: A Study of Educators Understanding of Evidenced-Based Literacy Practices
Lead Presenter: Martha Elford, University of Kansas
Presenter: Heather Haynes, Texas Women's University; Susanne James, Southern Illinois University Edwardsville
Strand: Literacy
Presenters shared results of an exploratory study of pre-service and in-service teachers’ experiences in augmented-reality learning environments. Teacher-participants at this university are provided semi-immersive experiences with virtual students while delivering evidenced-based literacy instruction. Results from survey data (n=63) and semi-structured interviews were presented. Further instructional implications for utilizing these technologies were explored.
TLE TeachLivE™ Inaugural Conference Proceedings
University of Central Florida

Fall 2013
BACOT (Berg-Ashmann Classroom Observation Tool) – An iPad App for Analysis of Teaching When Using TLE TeachLivE™

Dr. Craig A. Berg, The University of Wisconsin-Milwaukee
Dr. Scott Ashmann, The University of Wisconsin-Green Bay

Introduction
Throughout their careers, teachers are observed, not only by students, but also by methods instructors, cooperating teachers, university supervisors, and school administrators. Observations via videotape and self-reflection also are critical aspects of learning to teach, in classroom settings and in virtual environments. This observation, feedback, and reflection is an essential component of the teaching improvement process. The act of teaching is complex, with many teacher and student actions and responses occurring in a short amount of time. To assist with data collection during classroom observations of lessons, including observations of teachers using TLE TeachLivE™, we have developed an iPad application (currently called BACOT) for the purpose of collecting objective, valid, and reliable data to be used by an observer to help a teacher improve his or her teaching practice.

Form and Function
This iPad application consists of four components – pre-observation data, data gathered during the observation of a lesson, post-observation data, and data analysis and reporting.

Pre-observation Data - Ideally, an observer can meet briefly with the teacher prior to the teaching episode and ask questions such as: 1) What are your objectives for this lesson?, 2) How will you know your students have learned the content?, 3) What teaching strategies/processes will be used?, and 4) What specifically would you like me to watch for in this lesson? In addition, a student seating chart of the classroom can be constructed, that shows where the students are seated, in relationship to the teacher’s desk, and/or front of the classroom, so the observer and teacher being observed understand the orientation of the student seating chart. In addition, once the seating chart has been established, the observer has the option of entering demographics of the students, including gender, minority status, ELL, or students with special needs. This feature sets up the possibility of examining the teacher-student interactions to determine if a particular group of students chose not to contribute responses or perhaps was ignored during the lesson. In addition, this feature also allows for an analysis of the students who were responsible for management issues.

Data Gathered During Observation – As stated, the act of teaching is complex, with many teacher and student actions and responses occurring in a class period. Nevertheless, some discrete features are viewable on the data collection screen seen in Figure 1 that enable the observer to break down a complex set of interactions into discrete actions and events. Six areas of the data collection screen, when explained, give the reader a sense of how this App works.

First, as mentioned, the student seating chart indicates an approximate placement of where students are located, and enables the observer to connect specific students to various student actions.
Second, above the seating chart is the running record of teacher and student behaviors; a window that fills with data and scrolls upward as new data are entered from touching buttons in the next three columns described henceforth, beginning with the column closest to the seating chart and proceeding to the left hand column.

Third, the lesson-type column has sixteen buttons with labels that represent most of the various types of teaching strategies seen in typical classrooms. The type of activity students are presented may remain the same throughout the teaching period, or may change multiple times. For example, the teacher may begin with administrative duties such as taking role, or have students begin a brain teaser immediately upon entry to the classroom. After a few minutes, the lesson may proceed into a small group activity, followed by a short lab activity, followed by students individually working on some problem sets. This lesson example had four different components and as such, the iPad App is designed so the observer can note when a lesson type begins, and when it changes to another lesson type. This shift is important when the observer wants to single out a specific lesson type and focus the analysis on that particular segment. Therefore, the observer and teacher can examine the data in light of a particular strategy. If students were engaged in an inquiry lab segment, this particular sub-set of the data collected could be examined to determine if the teacher-student interaction tendencies and patterns were supportive of inquiry and facilitating student thinking, versus merely following instructions.

Fourth, the middle column contains a set of buttons with codes that reflect various things teachers might do when interacting with and reacting to students during a lesson. For example, the teacher might be presenting information (T1) or giving directions (T2). They probably ask questions at some point which are coded as one of four types (T3a – T4). And after a student responds to the question, there are eight codes representing what teachers might do following a student response.

Fifth, the far left column contains three sets of codes, with the top set containing codes representing actions relevant to student responses or discourse. For example, S1 is used when a student asks the teacher a question, while S2 represents a student asking another student a question. S5 is used to indicate that a student responded to a question posed by the teacher. And to provide an even greater depth of understanding, the observer has the option of tapping a student number in the seating chart, prior to tapping the S code, thereby providing rich data for analysis in terms of which students were contributing to the discourse. Or in the case of the set of buttons labeled with M1 – M4, data on which particular students contributed to behavioral issues during the lesson, and whether the teacher dealt with the inappropriate behavior. (What about the U codes?)

Lastly, the long vertical bar between the T and S codes is used to collect wait-time. Without going into an in-depth discussion, wait-time is a critical feature of an effective discourse pattern, and as such when collected, provides the observer and teacher information on the four different types of wait-time.

In short, as keys are tapped, the running record provides the reader with visual feedback and a record of what L, T, S, M, and U codes are in play: What code was tapped, when were they
tapped in terms of time from the beginning of the lesson, how long that specific action lasted, and how much wait-time is connected to that action (with regard to questioning and responding).

Post-observation Data – Following the lesson, prior to sharing data and analysis or comments from the observer, a few questions are posed to the teacher, such as: 1) How do you think things went in class? 2) As you taught the lesson, were there some aspects of the content you wish you knew more about? 3) Did the students learn what was intended? How do you know? And this last question is posed after the data analysis is shared and discussed with the teacher. 4) As a result of what you have learned from this lesson and our discussion, what elements of teaching are you going to focus on between now and the next observation?

Post-observation Analysis – The type and amount of analysis can vary depending upon the observer’s or teacher’s intention of the lesson, or focus and interest of analysis. But typical analysis provides raw counts of events during a lesson, such as number of yes/no, short answer, or open-ended questions asked, percentages of types of teacher and student actions, use of wait-time, time spent on various teaching strategies, which students participated in the lesson, the nature of their participation, and the types of interactions between teacher and students, and among students.

Value of the iPad App

While of some value when learning or trying to improve teaching skills, it is insufficient to analyze and reflect on teaching using general statements, based on impressions, or in the case of a teacher, a pretty subjective viewpoint that is based on memory, of which took place in a very chaotic and complex setting, where teachers are focused on teaching, and not on collecting data during this teaching episode.

The BACOT iPad App provides very specific and critical indications of many things including indicators of student engagement in the lesson, and provides data that observers can use to structure feedback regarding strengths or weaknesses of the teacher’s teaching. This iPad application will allow observers to collect data that will show teachers the prevalence of their discourse pattern in their classrooms, which are data that may cause them to want to change their teaching practices. It also provides indicators and levels of student engagement in the lesson, as well as indicators that provide feedback to the instructor as to whether their teaching practices match up with their goals for instruction.

In terms of using the BACOT iPad App with TLE TeachLivE™, users are drawing upon this virtual teaching simulation to not only identify what they do in front of students, but also to practice their teaching skills with the goal of improvement. Whether teaching in front of five students or 35 students, observers can collect and examine indicators of effectiveness. The iPad App will allow users of TLE TeachLivE™ to more easily determine patterns and tendencies of teaching while using this software and to identify and recognize changes in teaching due to the use of TLE TeachLivE™. The iPad App can be used by an observer concurrently during the observation, or used by the observer or teacher while watching a video of the teaching episode.
Figure 1. Screen shot of the BACOT iPad App
Literacy Instruction for Pre-service Educators in Virtual Learning Environments
Martha D. Elford, Susanne M. James, Heather Haynes-Smith

Introduction

This white paper explores the results of a qualitative study focused on pre-service and in-service educators’ experiences in virtual learning environments (VLE), specifically the TLE TeachLivE™ KU mobile lab. In this VLE, educator/participants are provided semi-immersive experiences with virtual students while delivering evidenced-based literacy instruction. The mobile lab permits the researcher to take TLE TeachLivE™ KU to the teachers, rather than bringing the teachers to the stationary TLE TeachLivE™ lab located on the University of Kansas main campus. The need for more experiential learning for pre-service educators to learn evidenced-based literacy practices that have a high impact on students with disabilities is pressing for teacher preparation (Clark, Threton, & Ewing, 2010). Students prefer to have numerous learning activities and other experiential methods in pre-service education course work (Chen, Chan, Tang & Cheng, 2009). With the experiential learning opportunity TLE TeachLivE™ KU offers, teacher education can be responsive to educator needs and better prepare special educators for literacy instruction. The purpose of this exploratory study was to examine participants’ perceptions, efficacy, and attitudes toward using TLE TeachLivE™ KU as an experiential practice tool for literacy instruction strategies for special education advanced practicum students. In this study, eleven pre- and in-service special educators participated in TLE TeachLivE™ KU, practicing a read-aloud activity with the Generation One TLE TeachLivE™ virtual students.

Background

Recent National Assessment of Educational Progress (NAEP) data indicate reading scores for students with disabilities were lower in 2011 than in 2009 and the scores for eighth grade students were not significantly different than they have been since 1998 (National Center for Education Statistics, 2011). Teachers of grades 4 through 12 typically receive little preparation in teaching reading comprehension and vocabulary skills (Snow, 2001), key skills assessed on the NAEP. To effectively address literacy skills, special education candidates need to have strong content knowledge of reading, as well as pedagogical skills specific to reading (Brownell et al., 2005). Consequently, having more time to practice these reading concepts will increase the proficiency of special educators to provide appropriate experiences with behavior management and strategy instruction within their pre-service programs (Beeth & Adadan, 2006) to assist in further developing the adequate knowledge and skills to successfully apply in the field experiences and future teaching positions (Darling-Hammond, Hammerness, Grossman, Rust, & Shulman, 2005).

Solution

This exploratory study sought to understand the participants’ perceptions, efficacy, and attitudes toward VLE to practice evidence-based, literacy instruction and classroom management techniques through spontaneous teacher-student interactions. The evidence-based practices selected were researched by nationally recognized literacy experts and employ a
variety of methodologies (Haager, Klingner, & Vaughn, 2007; Moats, 1999; NRP, 2000). The use of augmented-reality simulations to approximate teaching situations through use of various technologies is emerging as a valid approach to teacher preparation and professional development (Andreasen & Haciomeroglu, 2009; Deiker, et al., 2008; Hughes et al., 2005; Mapes, Tonner, & Hughes, 2011; Zhu et al., 2011).

**Procedures and Results**

Data collected and analyzed suggests participants recognize value in practicing literacy instruction and classroom management skills in a VLE, and repeated practice, combined with coaching results in higher confidence and competence. Following a five-minute session in the TLE TeachLivE™ KU Lab with the task of engaging in a “read-aloud” activity with the student avatars each participant read the same book, *Miss Alaineus: A Vocabulary Disaster* by Debra Frasier. After the simulation, an After Action Review (AAR) guided the participants in their reflection about experiencing VLE (Baird, Holland, & Deacon, 1999; Morrison & Meliza, 1999). An AAR is a structured approach for reflecting on the work by an individual to improve performance (Baird, Holland, & Deacon, 1999). Semi-structured interviews from the AAR were recorded and transcribed. The following three themes surfaced from the interviews: (a) classroom management, (b) technology, and (c) instruction.

Participants agreed that practice with classroom management strategies were necessary during the read-aloud. In addition, all interviewees thought the behaviors of the student-avatars were similar to what the participants had experienced with actual students in their own classrooms.

![Figure 1. Interview Themes](image-url)
Technology, the second major theme from the interviews, reflected interesting and significant perceptions. The appearance of the avatars themselves was frequently mentioned. Several participants commented on the avatars’ jerky movements demonstrated by Generation One student avatars of TLE TeachLiveETM. However, all of the participants agreed that they were able to concentrate on the personalities and responses and ignore the technology.

The last theme, instruction, reflects the value of VLE for refining the necessary components of quality instruction, e.g. planning, pacing, best practices, content delivery and reflection. If able to participate a second time, or repeatedly, many participants reported it would probably help them pace the lesson better and deliver the content more proficiently. A few participants confessed to not spending adequate time planning because they felt like they already knew how to do a read-aloud. Every participant agreed that TLE TeachLivETM KU offered a valuable opportunity for him or her to reflect on their instruction and determine how they could improve their skill.

**Conclusion**

Overall, the participants expressed positive reactions to the experience. The results from participant interviews revealed three themes in thoughts and perceptions on the experience: classroom management, technology, and instruction. The general consensus was the greatest benefit for TLE TeachLivETM KU was for pre-service teachers who could apply the theories from their coursework. However, a few participants suggested that in-service teachers who were expected to implement new strategies would benefit from practicing them in a VLE because there was no risk involved. Several limitations to this study exist (a) the evidence base on the efficacy of virtual learning environments to facilitate learning is still growing; (b) the student avatars exhibited limited behaviors to students for feedback in the brief session; and (c) the existence of prejudice for some teachers to the technology. Future studies should reflect on these limitations when determining the preparation of teachers for participating in VLE and the length of sessions. This exploratory study and results are important to teacher education and in-service professional development programs focused. They suggest many benefits to participation in VLE of improving instruction, building teacher skills, building confidence, and incorporating new technologies.
References


Bransford (Eds.). Preparing teachers for a changing world: What teachers should learn and be able to do (pp. 390-441). San Francisco: Jossey-Bass.


Acquisition, Refinement, and Maintenance of Skills by Preservice Teachers in TLE TeachLivETM at WVU

Kim Floyd, Sara Aronin, Melissa Hartley, Barbara L. Ludlow, Holly DeVito, Crystal Smith
West Virginia University

The West Virginia University College of Education and Human Services, an early partner in the TLE TeachLivETM Virtual Classroom Project at the University of Central Florida, uses this technology in activities related to its teaching, research, and service missions. The lab, housed in a room in Allen Hall, is operated by a lab manager who is teacher-in-residence with certification and many years of experience in special education who works under the supervision of the chair of the Department of Special Education. The lab manager schedules the room, operates and maintains equipment, supports students or research participants when needed, makes digital recordings of sessions, and troubleshoots any problems that arise.

The College chose to invest in the TLE TeachLivETM simulation lab to enable faculty to 1) engage preservice students in targeted practice of instruction and management strategies (student engagement, informal assessment, lesson planning and delivery, and individual and group behavior support; 2) assign time in the virtual classroom as an extension of field experiences that exposes students to a greater range of diversity than exists in local schools and to more challenging situations than typically occur in a model classroom; and 3) conduct research to examine how individuals learn special education practices as well as how virtual reality applications contribute to student learning.

Faculty have used the lab in both undergraduate and graduate teacher education programs, with both special education and general education teacher candidates, as a highlighted activity during recruitment and orientation of new students, and as a focus for research. Sessions conducted in the lab last from 5 to 30 minutes, may be conducted once or multiple times across a semester, and generally include a routine of live interactions with the avatars, completion of an after-action review, self-reflection following review of recorded session, and faculty or researcher feedback on performance.

The special education faculty have embraced this virtual classroom simulation, planning and implementing a variety of learning activities that are conducted in the TLE TeachLivETM lab throughout the campus-based five-year teacher education program so that these virtual experiences complement and elaborate the extensive field experiences these preservice students have in local public school classrooms. Several current applications are described below.

Developing Skills for Individualizing Instruction

SPED 364 is a course on individualized education programming for undergraduate students planning to become special education teachers and is the first methods course they take in this major. Students are randomly assigned a student avatar with whom they complete four sessions in the TLE TeachLivETM lab. In the first two sessions, students get to know the avatar student. In the third session, students practice informally assessing the avatar student in reading and math, then use the assessment results to write present levels of academic performance as well annual
goals and objectives to address areas of need. In the last session, students tutor their student avatar in an area of need. All sessions are recorded so students can write reflections and the instructor can assess performance.

SPED 601 is a graduate course in differentiated instruction for students seeking initial certification in elementary or secondary education at the post-BA level. Each student uses the TLE TeachLivE™ lab for five sessions. During the first two sessions are “getting to know you” sessions, with students asked to learn about the avatar students’ interests to increase engagement during lessons. In the third session, students teach an interactive lesson that engages the student avatars as they practice respectfully disengaging power struggles while allowing the avatar student to “save face,” and redirecting the student back to the lesson. In the fourth session, students teach a lesson that activates the avatar students’ prior knowledge. In the fifth session, students practice direct instruction (di), preparing their own scripts and using oral responding and error correction. In all sessions, students are expected to address any inappropriate comments in a professional manner. All sessions are recorded so students can write reflections and the instructor can assess performance.

**Developing Skills for Addressing Bullying Behaviors**

SPED 365 is a methods course on technology and universal design for learning that is designed for undergraduate special education majors. The TLE TeachLivE™ lab was determined to be a safe environment in which these preservice teachers could practice skills for preventing and responding to bullying incidents (developing class rules/contract to dealing with verbal and physical bullying and counseling bullies and their targets) and responding to school lockdown situations (taking control and keeping students and self calm in a stressful situation). Five sessions are conducted in the lab across the semester.

In the first and second lab sessions, students develop classroom rules and consequences, which must include zero tolerance toward acts of bullying and bystander behaviors, discussing with the avatar students the rationale for such a rule and the impact of bullying behaviors on targets. In the third session, as students teach prepared lessons, they encounter an unanticipated bullying incident (pre-planned by the instructor) by one of the avatar students. Students are expected to stop the lesson, address the bullying incident, implement the consequences, and reiterate the reasons for addressing bullying. In the fourth session, students select one of three scenarios in which a bullying incident has occurred and must address the incident, validate the feelings of the target, and discuss the bully’s restitution to the target.

In the last session, within 15 seconds after the student begins the lesson, a Code Red is announced indicating there is a shooter in the building and lock down has begun. Students are expected to remind avatar students what constitutes a Code Red, taking control of the classroom to ensure the safety of students (e.g., lock the door, close blinds, assisting students, remain calm) as well as reassuring students by addressing questions, comments, and fears.
Developing Skills for Enhancing Classroom Management

SPED 493/593 is an elective course on classroom management that students in both general and special education programs can take in their senior or graduate year. The course is taught entirely in the TLE TeachLive™ lab except for the first and last classes of the semester in a flipped classroom model. The instructor used Robert Marzano’s Art and Science of Teaching framework to develop a rubric for Domain 1 Classroom Strategies and Behavior – Design Questions 5, 6, 7, 8, & 9. These domains focus on rules and procedures, student engagement, effective relationships, and high expectations. The rubric is used during each of the nine sessions students are in the lab to assess their implementation of effective classroom management strategies.

The first class of the semester is used for the students to find out more about their own learning and teaching styles as well as to determine specific learning goals for the semester and a baseline within each of the domains. Also during this first class, students create their first lesson plan for the student avatars that must include a “get to know you” activity, an activity to develop the classroom rules, and a bullying plan.

In each remaining week, students watch a faculty-made video about one or more of the domains and specific criteria for that domain. After watching the video, students complete an activity that they are encouraged to incorporate into their lab session. Then they spend 30 minutes in the lab teaching any content they choose using specific elements of the activity but they are also presented with a classroom management challenge every time (e.g. a bullying incident on the bus or a fire drill during class). In each session, the rating sheets are filled out by the instructor, a peer, and the student and students are expected to graph and present all data points at the end of the semester.

Future Plans for TLE TeachLivE™ at WVU

Since the lab opened in Spring 2011, the lab has served nearly 500 students and has logged over 400 hours of interactions with student avatars. Student feedback on informal evaluations and in formal faculty evaluations reveals that students place a high value on their experiences in the TLE TeachLivE™ lab and feel these sessions have contributed significantly to their growth as prospective teachers. Faculty have made many presentations at national conferences on their uses of the lab and are in the process of submitting manuscripts for possible publication in professional journals. Each year, the lab is incorporated into more courses and new research projects across a broader range of disciplines and program units. As more avatars become available at different age levels and with specific disabilities, the College expects that more teacher educators and researchers will find new and creative uses for the lab, consistent with its strategic plan focus on new and emerging technology applications in education.
TLE TeachLivE™ vs. Role-Play: Comparative Effects on Special Educators’ Acquisition of Basic Teaching Skills

Melanie Rees Dawson & Ben Lignugaris/Kraft

A core goal of teacher preparation programs is to close the gap between knowledge and practice (Allsopp, DeMarie, Alvarez-McHatton, & Doone, 2006; Dieker, Hynes, Hughes, & Smith, 2008; Hixon & So, 2009). To do so, teacher trainers often construct learning opportunities using situated learning as a theoretical foundation. The theory of situated learning suggests that knowledge acquisition requires realistic content and complexity, and that knowledge transfer depends on how closely practice opportunities match the situation in which the information is to be applied (Brown, Collins, & Duguid, 1989).

Simulating classroom scenarios is one strategy for situating learning for novice teachers. Role-playing is perhaps the oldest form of classroom simulation, dating back to the 1800s (Brown, 1999). Recently, virtual simulations have emerged in teacher training programs (Hixon & So, 2009), which are examples of “technology-enhanced learning.” This term suggests that approaches utilizing technology are more effective or efficient than traditional approaches (Kirkwood & Price, 2013). TLE TeachLivE™ is a virtual classroom simulation that enhances learning by providing active practice opportunities and by realistically representing the complexities that exist in actual classrooms (Dieker et al., 2008).

The purpose of these research studies was to investigate the effectiveness of practice sessions in TLE TeachLivE™ (a technology-enhanced approach to classroom simulation) compared to practice sessions in role-play (a traditional approach to classroom simulation) on preservice special educators’ development of essential teaching skills.

Methods: Study 1

Participants

Seven teachers in an Alternative Teacher Preparation program at Utah State University participated in the studies. All teachers were serving as full-time special educators on letters of authorization while pursuing their certification. Participants taught in a range of settings, from elementary to secondary, and from self-contained to resource classrooms. They were given $150 at the conclusion of the study.

Measures

The two dependent measures for Study 1 were: (1) Opportunities to respond (OTR): The teacher asks an academic question and indicates if it is directed to the group or an individual student (reported as OTR rate), and (2) Praise: Positive teacher statements and gestures referring to student work or behavior. Specific praise statements directly reference the work or behavior (reported as praise rate).

The dependent measures were scored from an assessment session in TLE TeachLivE™ Gen 3, which immediately followed each intervention session in either TLE TeachLivE™ Gen 1 or
role-play. (The terms Gen 1 and Gen 3 designate two different classes of virtual students). The teachers delivered 5-mins of instruction for each assessment session, during which the virtual students produced approximately 4 academic errors and 4 misbehaviors. These sessions were recorded using a FlipCam and scored later.

The primary data collector scored 100% of the videos and the secondary data collector scored 31% of the videos. The average IOA was 88.1% for OTR rate (range: 71.4%-100%), and 88.4% for praise rate (range: 70.8%-100%).

**Intervention**

Prior to practice sessions, participants were required to watch a video about each target skill, view a handout with examples and non-examples, and take a quiz to assess their understanding. Lab mentors provided lesson content adapted from the reading program *StoryTown*. Each lesson contained 6-10 vocabulary words with student friendly definitions. The mentors also provided basic teaching formats to help the participants decide how to deliver their instruction (e.g. example/non-example, sentence generation, sentence substitution).

Table 1 outlines the crucial components of the intervention. It also illustrates that both training settings were designed to be as similar as possible, with one crucial difference: in TLE TeachLivE™ the participants interacted with 5 virtual students and in role-play they interacted with 3 colleagues who played students.

Table 1. Intervention Components in TLE TeachLivE™ and Role-Play

<table>
<thead>
<tr>
<th>Component</th>
<th>TLE TeachLivE™ Lab</th>
<th>Role-Play Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students</td>
<td>5 virtual students (Gen 1)</td>
<td>3 colleagues playing students</td>
</tr>
<tr>
<td>Lesson</td>
<td>Vocabulary (StoryTown, Grade 6)</td>
<td>Vocabulary (StoryTown, Grade 6)</td>
</tr>
<tr>
<td>Practice</td>
<td>Three 3-min turns</td>
<td>Three 3-min turns</td>
</tr>
<tr>
<td>Complexity</td>
<td>No misbehaviors</td>
<td>No misbehaviors</td>
</tr>
<tr>
<td></td>
<td>No academic errors</td>
<td>No academic errors</td>
</tr>
<tr>
<td>Feedback</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mentor</td>
<td>Share data on target skill</td>
<td>Share data on target skill</td>
</tr>
<tr>
<td>Participant</td>
<td>Verbalize strengths and areas to improve</td>
<td>Verbalize strengths and areas to improve</td>
</tr>
<tr>
<td>Written</td>
<td>Copy of the data for 3 consecutive teaching turns</td>
<td>Copy of the data for 3 consecutive teaching turns</td>
</tr>
<tr>
<td>Debrief</td>
<td>Connections to their own classrooms</td>
<td>Connections to their own classrooms</td>
</tr>
</tbody>
</table>

Intervention Setting vs. Assessment Setting. Table 2 illustrates the key differences between the intervention settings and the assessment setting. Following each practice session in either TLE TeachLivE™ or role-play, participants generalized their skills to a different classroom of
students, a more complex teaching environment (that included student misbehaviors and errors), and new lesson content.

Table 2. Comparison Between the Intervention and Assessment Settings

<table>
<thead>
<tr>
<th></th>
<th>Intervention</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting</td>
<td>TLE TeachLivE™ Gen 1 or role-play</td>
<td>TLE TeachLivE™ Gen 3</td>
</tr>
<tr>
<td>Complexity</td>
<td>No misbehaviors</td>
<td>4 misbehaviors and</td>
</tr>
<tr>
<td></td>
<td>No academic errors</td>
<td>4 academic errors</td>
</tr>
<tr>
<td>Lesson</td>
<td>1 lesson for TLE</td>
<td>A new lesson for each</td>
</tr>
<tr>
<td></td>
<td>TeachLivE™</td>
<td>assessment session</td>
</tr>
<tr>
<td></td>
<td>1 lesson for role-play</td>
<td></td>
</tr>
</tbody>
</table>

**Design**

An alternating treatments design was used for this study, which allowed quick comparison of the two treatments without requiring a baseline. (Cooper, Heward, & Heron, 2007). Treatments were alternated between TLE TeachLivE™ and role-play. Target skills were counterbalanced across treatments and groups. Specifically, Group 1 practiced praise in TLE TeachLivE™ and OTR in role-play, and Group 2 practiced OTR in TLE TeachLivE™ and praise in role-play.

**Results: Study 1**

Group averages for each assessment session are displayed in Figures 1 and 2. In an alternating treatments design the vertical distance between the two data paths are visually compared. According to Cooper et al. (2007), “when the data paths for two treatments show no overlap with each other and either stable levels or opposing trends, a clear demonstration of experimental control has been made” (p. 189). Based on these criteria, the results for both groups demonstrate experimental control favoring the TLE TeachLivE™ intervention. Participants in each group demonstrated a higher response rate for the skill practiced in TLE TeachLivE™ than the skill practiced in role-play. Specifically, Group 1 achieved higher average rates for praise than OTR, and Group 2 achieved higher rates for OTR than praise.
Methods: Study 2

Study 2 was conducted immediately following Study 1, using the same participants and the same intervention and assessment settings. Two new dependent variables were introduced: (1) Error Correction: When a student makes an error, the teacher models the correct answer, tests the student on the initial question, and after one or more intervening responses retests the student (reported as percentage of correct steps) and (2) Praise Around: When a student exhibits a misbehavior that is persistent (5 s or longer) or recurring, the teacher praises another student who is exhibiting the desired behavior using a specific praise statement. Then, when the target student exhibits the desired behavior, the teacher praises that student using a specific praise statement (reported as percentage of correct steps).

The intervention components for TLE TeachLivE™ and role-play were the same for Study 2 as they were in study 1 with one exception: student errors were introduced when participants were practicing error correction, and student misbehaviors were introduced when participants were practicing praise around. The assessment setting remained constant from Study 1, still containing both errors and misbehaviors.

An alternating treatments design with a baseline phase was used for Study 2. Baseline data was collected during Study 1. The target skills were counterbalanced across treatments and settings. Group 1 practiced praise around in TLE TeachLivE™ and error correction in role-play and Group 2 practiced error correction in TLE TeachLivE™ and praise around in role-play.

Results

Group averages for each session are displayed in Figures 3 and 4. During baseline, participants from both groups correctly delivered some steps for error correction, but very few steps overall for praise around. During intervention, both groups demonstrated higher performance overall on the skill practiced in TLE TeachLivE™ than the skill practiced in role-play. However, by the end of the study, participants’ performance levels on both skills were similar.
Overall, teachers demonstrated higher rates and percentage of correct steps in the assessment session on the skill they practiced in TLE TeachLivE™ Gen 1 compared to the skill they practiced in role-play with colleagues. These results suggest that TLE TeachLivE™ (a technology-enhanced simulation) may facilitate development of essential teaching skills more effectively than role-play (a traditional simulation). However, given the results of Study 2, it is unclear to what extent these differences would maintain across time.

**Limitations.** Because no data were collected or reported from the intervention session, it is unclear if the participants mastered the target skill before generalizing their performance to the assessment setting. Also, because no data were collected or reported from the participants’ actual classrooms, it is unknown to what extent they demonstrated the target skills during authentic teaching situations.

**Future research.** Future research should focus on TLE TeachLivE™ without a comparison condition to determine how many sessions teachers require to become proficient on each target skill. Researchers should collect data in authentic classroom settings to investigate to what extent levels of proficiency observed in TLE TeachLivE™ transfer to actual teaching. Also, based on the theory of situated learning, researchers should consider selecting a homogenous group of participants who have teaching situations that are similar to TLE TeachLivE™ (e.g. secondary settings, small-group instruction). If transfer effects are demonstrated from TLE TeachLivE™ to similar classroom settings, researchers can then determine to what extent skill development in TLE TeachLivE™ can transfer to increasingly dissimilar settings (e.g. elementary settings, large group teaching situations, students with different disabilities from the TLE TeachLivE™ students).
References


Exploring the Impact of Virtual Classroom Technology on Learning to Teach  
Scott Sander PhD; Educational Leadership; Miami University, Oxford, OH

Abstract

The virtual classroom technology, TLE TeachLivE™, was used with adolescent-young adult (AYA) science methods students to supplement traditional field experiences and provide additional opportunities for teaching inquiry-based lessons. Student practice sessions revealed many of their deeply held, objectivist beliefs about the nature of science, teaching and learning. TLE TeachLivE™ became more than a pedagogical tool, as a site of analysis for teacher educators, TLE TeachLivE™ exposed some of the dominant discourses operating to control students’ actions. In this paper the author discusses some of the initial findings from using TLE TeachLivE™, looking to extend the conversation and open up additional opportunities for its use in benefitting teacher preparation. As cited throughout the literature in teacher education, learning to teach is a complex endeavor (Darling-Hammond & Bransford, 2007; Russell & Martin, 2007; Wilson, Floden, & Ferrini-Mundy, 2001). Much of the complexity stems from the contradictory messages and mismatched messages that preservice teachers (PSTs) receive in teacher preparation courses as compared to their past experiences (Feiman-Nemser, 2012). While most were taught in a traditional, teacher-centered environment, they are now being asked to teach according to a more student-centered, inquiry approach. For novice, preservice teachers these can seem like two completely separate worlds and they may be unaware of how their previous school experiences have shaped, limited, and confined their thinking (Feiman-Nemser, 2012).

Much of the challenge for teacher educators, therefore, lies in finding ways to bring awareness to the contradictory messages, provide viable alternatives, and then assist PSTs to reconcile the mismatches between what they have observed and experienced as students and what they are now being told as future teachers (Strike & Posner, 1982). This is no small task as the teacher-centered model that has dominated classrooms for the past 100 years (Lagemann, 2000) has become so familiar for students that many beliefs and assumptions about teachers, teaching, and school have become taken-for-granted, unquestioned, and common-sense. Teacher education must find ways to overcome the barriers presented by prior experiences of those who desire to learn to teach if we truly want to shift how classrooms operate.

Description of the Project

A research study was completed during the spring semester of 2013, to investigate how preservice science teachers negotiated these contradictory messages as a result of their interactions with a science methods course designed to help PSTs develop a greater understanding of learning to teach. Science methods students were charged with “teaching inquiry-based science lessons” utilizing the virtual classroom, TLE TeachLivE™. The content topic, Particulate Nature of Matter (PNM), was selected for them due to its foundational aspects. An understanding of PNM would be a prerequisite for teaching any of the content majors (life, earth, physical) for PSTs enrolled in the science methods course. The content was intended to serve as the vehicle to allow students to develop three designated aspects of inquiry at the
beginning of their lesson. Each session, PSTs were given 8-10 minutes to 1) engage students in discussion, 2) using open-ended questions that would allow 3) assessment of their prior knowledge of PNM. TLE TeachLivE™ provided the safe environment required for students to gain multiple experiences with executing specific aspects of inquiry that even traditional field placements don’t allow. The practice sessions became much more informative than expected.

**Initial Findings**

What initially started out as strictly a pedagogical tool intended to help PSTs to practice their inquiry-based teaching, actually served a second, much more valuable purpose – as a diagnostic tool. TLE TeachLivE™ became a window into the thinking of preservice teachers as their actions revealed many of the dominant discourses so pervasive in education. Despite being in university courses that stress inquiry and constructivist models of learning, the disproportionate exposure to traditional teaching has caused an authoritarian approach to become engrained as the primary way to know, learn, and teach “science” (Feiman-Nemser, 2012).

Practice sessions in TLE TeachLivE™ exposed the ubiquitous vision of teacher that has become engrained within the minds of PSTs who took on the familiar role of “knowledge provider” whose job it is to provide deficient students with the content information. Even though PSTs were provided with an alternative view of teaching and learning (inquiry-based) that involves the teacher as a listener who asks questions to elicit prior knowledge while promoting and guiding discussions between students, TLE TeachLivE™ practice sessions saw PSTs revert back to teachers whose primary role is to deliver discrete, static content chunks to deficient students who are expected to passively consume information.

While the intent of the practice session was to open up discussion and set the stage for further exploration (utilizing the three aspects of inquiry), many PSTs tried to “teach” the concept in 8 minutes! One PST stopped midway through the session claiming she was done! Most striking was the lack of awareness that anything was wrong or problematic about taking a highly abstract concept and expecting all students to learn it in such a short amount of time. But this is consistent with how they were taught, and continue to be taught at the college level. The idea persists in every classroom that science can be “taught” and “learned” in discrete time blocks. Every college science syllabus lists the topics to be covered during each 50-minute class. It gives an impression of science as isolated chunks of information that are able to be transmitted, intact, from one person to another. This is what our future teachers have come to accept without question or hesitation; this objective nature of the world is taken-for-granted, deeply held, and highly resistant to change largely due to its familiarity over such an extended period of time. It was the actions of the PSTs in the TLE TeachLivE™ setting that really told the story about their well-entrenched beliefs that were blocking newer, inquiry-based alternatives from taking hold. But it was John Dewey who said, “We don’t learn from experience. We learn from reflecting on experience”. So it became important, not just for me to see what was going on but to bring greater awareness to the PSTs about their actions in the TLE TeachLivE™ environment. TLE TeachLivE™ practice sessions became the concrete experiences within a constructivist framework about learning to teach. Sessions were videotaped and combined with a cycle of reflective writings and feedback intended for PSTs to discover some of the same
things I was seeing in their actions and how these actions were the result of their prior experiences with traditional methods of instruction.

The initial findings of this research have led to a host of new questions and I envision future research that expands the potential benefits of TLE TeachLivE™ within teacher preparation. Can we find ways to expand TLE TeachLivE™ to various aspects of teacher training that will not only expose, but also start a treatment process for some of the more long-standing and pervasive discourses that persist? Familiarity with classrooms and teachers may prevent beginners from searching beyond what they already know and from questioning the practices they see (Feiman-Nemser, 2012). We must recognize the power of prior experiences to address core issues by not simply covering up surface level symptoms.

As an educational community, we must continue to explore how being taught impacts those now learning to teach. TLE TeachLivE™ can be a valuable site of analysis for those in teacher preparation to study the thoughts and actions of PSTs as they transition from students to teachers. With its ability to operate concurrently with methods classes, operate in a low-risk environment that allows for immediate feedback, TLE TeachLivE™ offers many benefits that traditional field experiences cannot with the potential to address many of the barriers that have prevented change in the past.

References
Updates from TLE TeachLivE™ National Research Study

Carrie Straub, Ph.D. University of Central Florida

Abstract

Virtual reality offers innovative ways for practicing teachers to craft their practice without placing “real” students at risk. A national research project using virtual rehearsal in a mixed-reality classroom was conducted in conjunction with multiple universities and school district partners. The focus of the research was to identify significant differences in teacher practice and student achievement based on type of professional development completed. This report details methods from year one of a three-year study.

Introduction

Immersive virtual environments have the potential to serve as intensive learning laboratories for future and practicing teachers by providing unique benefits such as the ability to facilitate teacher professional development (PD) without potential harmful effects on children (Dieker, Hynes, Stapleton, & Hughes, 2007). Immersive virtual environments can potentially change the face of teacher PD with innovative program models, and research should be conducted to establish the efficacy of their use for teacher education. The TLE TeachLivE™ virtual classroom (TeachLivE™) is an immersive, mixed reality simulator housed at the University of Central Florida (UCF) and is currently used by UCF’s College of Education and Human Performance and 22 university or school district partners to prepare pre-service teachers (TeachLivE, 2013). Users interface with the real-time classroom simulator and software allowing authentic interaction with computer-generated, animated student avatars. The TeachLivE™ virtual classroom provides opportunities for feedback and virtual rehearsal of teaching practice (i.e., repeated practice of teaching with feedback in a computer simulated environment) and as such, the research project also included an examination of the effect of virtual rehearsal on evidence-based, high quality pedagogical practices such as questioning, wait time, and feedback (TeachingWorks, 2013).

The purpose of this research study is to examine participants’ use of evidence-based, high quality pedagogical practices such as higher-level questioning, specific feedback, and wait time, in the TLE TeachLivE™ environment, and to evaluate the generalization of those practices to the traditional classroom setting. Multiple forms of data have been collected and evaluated to establish the efficacy of the TLE TeachLivE™ virtual classroom on teacher practice in terms of increasing targeted pedagogical strategies and generalization of those strategies to a traditional classroom setting.

Method

Participants were middle school mathematics teachers (N = 150) with highly qualified status in mathematics who had been identified by their supervisors as being able to benefit from PD in mathematics teaching practices. At each partnership site, school administrators identified approximately 20 teachers in need of PD. For inclusion in the study, teachers had to be primary
teacher of record in a middle school classroom (i.e., grades six through eight). After being selected by the school district, teachers were organized into groups based on school or building location to control for treatment diffusion across conditions. Then, the group’s participants were randomly assigned by the researcher at the main site to one of four experimental conditions, and each site was notified of their treatment group assignments. The random assignment procedure took place at all 10 sites, resulting in four experimental groups each occurring across 10 sites.

The research design was a pre-post quasi-experimental design replicated at ten sites across the country. Teachers were divided into four groups to take part in varying levels and types of innovative PD. All four groups received a high-quality lesson plan designed by the Mathematics Assessment Resource Service (MARS) aligned to the Common Core standards. The lesson was grounded in formative assessment and was “Solving Linear Equations in One Variable” (MARS, 2012). Common Core standards formed the foundation of the linear equations lesson and students were expected to make sense of problems and persevere in solving them, construct viable arguments and critique the reasoning of others, and look for and make use of structure. As a means of providing the least intensive level of PD, teachers in the control condition received only the linear equations lesson plan and a five-minute video explaining the benefits of implementing the lesson. All of the other treatment groups also received the linear equations lesson and accompanying video, however, additional levels of PD were experienced by teachers. In the online PD group (OPD-only), teachers learned about questioning and feedback grounded in the linear equations lesson in a highly interactive, 50 minute, synchronous online PD. In the TLE TeachLive™-only condition (TLE-only), teachers taught the linear equations lesson in the TLE TeachLive™ simulator and engaged in the integrated TLE TeachLive™ after-action review process over the course of 50 minutes designed for teacher practice reflection and review of questioning and feedback. The fourth group, TLE TeachLive™ & Online PD (TLE/OPD), combined both prior experimental conditions, receiving 50 minutes of online PD and then later, 50 minutes in the TLE TeachLive™ classroom. See Table 1 for an explanation of experimental treatment groups.

Table 1. Experimental Treatment Groups.

<table>
<thead>
<tr>
<th>Treatment Group</th>
<th>Treatment Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>• Linear Equations Lesson Plan &amp; Video</td>
</tr>
<tr>
<td>OPD-only</td>
<td>• Linear Equations Lesson Plan &amp; Video</td>
</tr>
<tr>
<td></td>
<td>• 50 minutes online PD</td>
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<tr>
<td>TLE-only</td>
<td>• Linear Equations Lesson Plan &amp; Video</td>
</tr>
<tr>
<td></td>
<td>• 50 minutes TLE TeachLive™</td>
</tr>
<tr>
<td>TLE/OPD</td>
<td>• Linear Equations Lesson Plan &amp; Video</td>
</tr>
<tr>
<td></td>
<td>• 50 minutes online PD</td>
</tr>
<tr>
<td></td>
<td>• 50 minutes TLE TeachLive™</td>
</tr>
</tbody>
</table>

Independent Variables

All groups were given a paper copy of the linear equation lesson plan upon completion of their pre-treatment observation. Teachers receiving online PD (OPD-only and TLE/OPD groups) signed up for a 50-minute session offered five times between 4pm EST and 9pm EST over the course of
two weeks. An international mathematics professional development expert with extensive experience with the linear equations lesson plan delivered the online PD. Adobe Connect provided a secure platform allowing for video conferencing activities in real time, opportunities for breakout groups to discuss content, and group discussion between participants and the expert. Learning objectives for the PD centered on formative assessment strategies such as questioning and feedback grounded in the linear equations lesson. The PD activities used authentic student work samples from formative assessment probes in the lesson.

After the online PD sessions were completed, teachers in the TLE TeachLivE™ conditions (TLE-only and TLE/PD) were contacted to schedule visits to the TLE TeachLivE™ virtual classroom, making sure to avoid times that would result in contact between different treatment groups. Teachers’ visits took place across the country at 1 of 10 partnership sites in a real classroom that housed the simulator system, creating TLE TeachLivE™, a mixed reality virtual classroom. Teachers were introduced to the environment and the method for virtual rehearsals within the TLE TeachLivE™ system. Teachers stood in front of a display screen portraying five middle school age children avatars seated in a classroom. The avatars operated by a hybrid intelligence model (A. Nagendran, personal communication, April 22, 2013), consisting of a series of pre-recorded behaviors and behaviors controlled by a human-in-the-loop (i.e., Interactor). Interactions were not tightly scripted, but followed a meta-script with certain parameters related to preset avatar thought processes and behaviors.

Teachers were scheduled for three visits to the TLE TeachLivE™ virtual classroom. The first visit consisted of 10 minutes in the simulator becoming familiar with the technology and the avatars with the objective of learning about the avatars’ interests. At the end of the first session, teachers received a packet of instructions that included directions for the next visit. Teachers were instructed to teach the Introduction Whole Class Discussion portion of the lesson and were given work samples ostensibly created by the avatar students. The work samples were the same as those shared with the OPD-only group during their online session. The second and third visits both consisted of 2 back-to-back sessions lasting 10 minutes each, in which the teacher repeatedly practiced teaching the same portion of the lesson with feedback (i.e., virtual rehearsal). The total time spent in the virtual classroom was 50 minutes. After sessions two through five, teachers completed an after action review process which included: 1) predicting performance in terms of frequency of describe/explain questions they asked and the frequency of specific feedback they gave, 2) receiving information about performance in terms of variables listed in part 1, and 3) reflecting on how they might change their practice in light of the information they gained.

**Dependent Variables**

Demographics data were collected on teachers and their students in the class in which they were observed. Teachers were observed for one class lesson pre-and post-experiment in their classrooms. Observational data were collected on the number and type of questions (i.e., yes/no, short answer, describe/explain questions); wait time (less than three seconds or three seconds or more); and feedback (specific or general). Also, scales adapted from sub-constructs of the Danielson framework were used to rate teacher behavior: managing student behavior, managing classroom procedures, establishing a culture for learning, engaging students in learning,
communicating with students, using questioning and discussion techniques, creating an environment of respect and rapport, and using assessment in instruction (Danielson, 2013).

Finally, qualitative field notes were collected to capture classroom practices. Teachers completing sessions in the TLE TeachLivE™ virtual classroom also responded to questions related to sense of immersion and presence in the simulation as well as general perceptions of the experience.

Data were also collected at the student level. Student achievement data were collected pre- and post-experiment. Students completed a 10-question assessment comprised of items from the National Assessment of Educational Progress eighth grade mathematics assessment from 2011 (National Center for Education Statistics, 2013).

**Results**

Data are still being collected from the sites participating in year one of the project. Once data have been entered, it will be analyzed to evaluate if significant differences exist between treatment groups. We expect to answer the following research questions:

Describe/explain questions:
1. Is there a difference in population mean on *percentage of describe/explain questions* asked during a 50-minute class period among teachers who received *50 minutes of TeachLivE™ (TLE-only and TLE/PD)*?
2. Is there a difference in population mean on *percentage of describe/explain questions* asked during a 50-minute class period among teachers who received *50 minutes of online PD (OPD-only and TLE/PD)*?
3. Are the differences in the population means on *percentage of describe/explain questions* asked during a 50-minute class period among teachers who received *50 minutes of TeachLivE™ (TLE-only and TLE/PD)* the same across teachers who received *50 minutes of online PD (OPD-only and TLE/PD)*?

Specific Feedback:
4. Is there a difference in population mean on *percentage of specific feedback* given during a 50-minute class period among teachers who received *50 minutes of TeachLivE™ (TLE-only and TLE/PD)*?
5. Is there a difference in population mean on *percentage of specific feedback* given during a 50-minute class period among teachers who received *50 minutes of online PD (OPD-only and TLE/PD)*?
6. Are the differences in the population means on *percentage of specific feedback* given during a 50-minute class period among teachers who received *50 minutes of TeachLivE™ (TLE-only and TLE/PD)* the same across teachers who received *50 minutes of online PD (OPD-only and TLE/PD)*?

Wait Time:
7. Is there a difference in population mean on *wait time of 3 seconds or more* during a 50-minute class period among teachers who received *50 minutes of TeachLivE™ (TLE-only and TLE/PD)*?
8. Is there a difference in population mean on \textit{wait time of 3 seconds or more} given during a 50-minute class period among teachers who received \textit{50 minutes of online PD} (OPD-only and TLE/PD)?

9. Are the differences in the population means on \textit{wait time of 3 seconds or more} given during a 50-minute class period among teachers who received \textit{50 minutes of TeachLivE^{TM}} (TLE-only and TLE/PD) the same across teachers who received \textit{50 minutes of online PD} (OPD-only and TLE/PD)?

Modified Danielson Sub-constructs:

10. Is there a difference in population mean on \textit{the overall score on a modified Danielson observation scale} administered during a 50-minute class period among teachers who received \textit{50 minutes of TeachLivE^{TM}} (TLE-only and TLE/PD)?

11. Is there a difference in population mean on \textit{the overall score on a modified Danielson observation scale} administered during a 50-minute class period among teachers who received \textit{50 minutes of online PD} (OPD-only and TLE/PD)?

12. Are the differences in the population means on \textit{the overall score on a modified Danielson observation scale} administered during a 50-minute class period among teachers who received \textit{50 minutes of TeachLivE^{TM}} (TLE-only and TLE/PD) the same across teachers who received \textit{50 minutes of online PD} (OPD-only and TLE/PD)?

Using Questioning and Discussion Sub-construct:

13. Is there a difference in population mean on \textit{the questioning and discussion sub-construct scale} administered during a 50-minute class period among teachers who received \textit{50 minutes of TeachLivE^{TM}} (TLE-only and TLE/PD)?

14. Is there a difference in population mean on \textit{the questioning and discussion sub-construct scale} administered during a 50-minute class period among teachers who received \textit{50 minutes of online PD} (OPD-only and TLE/PD)?

15. Are the differences in the population means on \textit{the questioning and discussion sub-construct scale} administered during a 50-minute class period among teachers who received \textit{50 minutes of TeachLivE^{TM}} (TLE-only and TLE/PD) the same across teachers who received \textit{50 minutes of online PD} (OPD-only and TLE/PD)?

Student Achievement Data:

16. Is there a difference in population mean on \textit{a 10-item student achievement assessment} administered during a 50-minute class period among students of teachers who received \textit{50 minutes of TeachLivE^{TM}} (TLE-only and TLE/PD)?

17. Is there a difference in population mean on \textit{a 10-item student achievement assessment} administered during a 50-minute class period among students of teachers who received \textit{50 minutes of online PD} (OPD-only and TLE/PD)?

18. Are the differences in the population means on \textit{a 10-item student achievement assessment} administered during a 50-minute class period among students of teachers who received \textit{50 minutes of TeachLivE^{TM}} (TLE-only and TLE/PD) the same across teachers who received \textit{50 minutes of online PD} (OPD-only and TLE/PD)?
TeachLivE™ Sessions:
19. Is there a significant difference in population mean on frequency of describe/explain questions after 20, 30, 40, and 50 minutes in TeachLivE™?
20. Is there a significant difference in population mean on frequency of specific feedback after 20, 30, 40, and 50 minutes in TeachLivE™?

Reliability of Data:
21. What is the relationship of the scores from two independent observers on the variables listed in research questions 1 through 20?

References
Study of a Mixed Reality Virtual Environment used to Increase Teacher Effectiveness in a Pre-service Preparation Program

Elizabeth Whitten • April Enicks • Luchara Wallace • Daniel Morgan
Western Michigan University

Abstract

This article provides a summary of how Western Michigan University (WMU) has utilized TLE TeachLivE™, a mixed reality virtual environment, to increase teacher effectiveness in their pre-service program. Recommendations for using TLE TeachLivE™ within a preparation program include an implementation model utilizing three approaches of scaffolded instruction and intervention.

Introduction

Fluidity among course content, instructional skill development, and practice is critical to effective teaching (Graham, 2006; Darling-Hammond, 2009). Athletes have practice games prior to the “real” game, musicians have practice sessions prior to the “real” recital, and now teachers have virtual rehearsal prior to “real” teaching! Technological advances have provided teacher educators with virtual environments to prepare pre-service teachers on how to respond to a variety of situations they will experience in the real classroom.

This article provides a summary of how Western Michigan University (WMU) has utilized TLE TeachLivE™, a mixed reality virtual environment, to increase teacher effectiveness in their pre-service program. The special education teacher preparation program at WMU is a five-year program. In the final three years of the program, students participate in applied experiences that are directly connected to the coursework taken in the same semester. During the fourth year in the program, students take three special education courses (nine credit hours) each semester, one of the three courses is a field-based experience located in a local school district.

To improve student performance in the field, TLE TeachLivE™ has been used as an intervention to scaffold pre-intern teaching skills. Skills utilized in the field-experience are focused on in TLE TeachLivE™. This allows the pre-interns an opportunity to practice the effective teaching skills, make a mistake, receive in-action coaching, teach again, and see the difference, and never harm a student in the process!

Description of Study

Participants

Students enrolled in fourth year special education coursework were recruited to participate in the study. Consent was obtained and kept from the co-investigators (who were also the course instructors) until the conclusion of the academic year to prevent coercion and bias.
Design

All activities involved in the study were required components of the coursework. Pre-interns participated in field-based experiences and in the TLE TeachLivE™ lab. In both settings pre and post self-reflections were completed, and pre-interns received feedback on their practice all using a standard observation tool.

In the practicum setting, pre-interns developed 18 to 20 lessons to then teach to their assigned K-12 students. Prior to each lesson, pre-interns predicted the outcome of their lesson using a Pre/Post Reflection Form and after their teaching experience, used the same tool to reflect on the experience. Use of an evaluative tool such as a framework is beneficial in order to provide explicit feedback (Danielson, 2007; Stronge, 2007). The self-assessment tool utilized for pre/post reflection and observer evaluation was developed from the Assessing Teacher Effectiveness (ATE) observation and scoring tool created by Kennesaw State University and modified by the Department of Special Education and Literacy Studies at Western Michigan University (WMU). Pre-interns were observed four to seven times by a trained observer using the ATE tool. After completing their post reflection, observed participants met with their observers to receive verbal and written feedback.

Participants were randomly assigned to one of two intervention groups each semester: 1) TLE TeachLivE™ or 2) on-line learning modules. Students assigned to Group 1: TLE TEACHLIVE™, completed four 10-minute TLE TeachLivE™ sessions throughout the semester. Each TLE TeachLivE™ session was also observed and scored using the ATE form. Consistent with the practicum experience, participants completed Pre/Post Reflection Forms for each TLE TeachLivE™ session. During each session, participants were provided real-time coaching as needed and immediate verbal and written feedback following their session (Enicks, 2012). Real-time coaching allowed the coach or observer to provide immediate feedback and support to the participant during the TLE TeachLivE™ session and also allowed the participant to implement changes in their practice based on coaching. Within twenty-four hours of each virtual teach, participants received an electronic copy of each scored ATE. Participants assigned to Group 2: on-line learning modules, completed assigned modules during the class time TLE TeachLivE™ took place. Pre-interns participated in the opposite experience during the spring semester to ensure all participants received both interventions. Interrater reliability of observers was checked bi-weekly throughout the academic year. In both practicum settings and the TLE TeachLivE™ lab observation sessions were scheduled with two or more observers to maintain fidelity of observational scoring.

Methods

A two-group randomized design was utilized for this study. Randomization was carried out within each class. In the fall, half of each class was randomly selected to participate in TLE TeachLivE™ while the other half completed on-line learning modules. Assignment to TLE TeachLivE™ and on-line modules were reversed in the spring semester. Participation in TLE TeachLivE™ and on-line learning modules was in conjunction with work in the practicum setting. By the end of the academic year all participants had participated in two practicum settings, TLE TeachLivE™, and on-line learning modules.
Results

Across practicum settings, all students showed steady growth from the initial observation to final observation in both practicum and TLE TEACHLIVE™ settings. As indicated in Table 1, participation in TLE TEACHLIVE™ and practicum resulted in positive gains in effective teaching skills as observed using the ATE observation form.

Table 1

Comparison of mean scores of participants in field and virtual experiences across two semesters

<table>
<thead>
<tr>
<th>Setting</th>
<th>Mean scores (out of 50 points)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TL1</td>
<td>31.2</td>
</tr>
<tr>
<td>TL2</td>
<td>35.0</td>
</tr>
<tr>
<td>TL3</td>
<td>38.5</td>
</tr>
<tr>
<td>TL4</td>
<td>41.9</td>
</tr>
<tr>
<td>Practicum1</td>
<td>32.0</td>
</tr>
<tr>
<td>Practicum2</td>
<td>37.5</td>
</tr>
<tr>
<td>Practicum3</td>
<td>40.8</td>
</tr>
<tr>
<td>Practicum4</td>
<td>42.4</td>
</tr>
</tbody>
</table>

Paired samples t-tests were run to compare changes in students’ ATE observation scores following each TLE TEACHLIVE™ session and each practicum observation. Even though steady growth was found in both settings as seen in Table 2, there was a weak correlation found between the performance scores in TLE TEACHLIVE™ and performance on the practicum observation immediately following TLE TEACHLIVE™ sessions 1-3.

Table 2

Levels of significance found between field and virtual experiences across two semesters

<table>
<thead>
<tr>
<th>Setting</th>
<th>Correlation</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>TL1 to Practicum1</td>
<td>.418</td>
<td>.005</td>
</tr>
<tr>
<td>TL2 to Practicum2</td>
<td>.396</td>
<td>.008</td>
</tr>
<tr>
<td>TL3 to Practicum3</td>
<td>.458</td>
<td>.002</td>
</tr>
<tr>
<td>TL4 to Practicum4</td>
<td>.123</td>
<td>.457</td>
</tr>
</tbody>
</table>

Overall, there was growth in pre-intern observation scores in both field-based and TLE TEACHLIVE™ settings across both semesters; however, the data does not directly attribute growth in the field-based experience to TLE TEACHLIVE™ sessions. Therefore, more research is needed to determine if there truly is a carry-over effect across teaching environments.
Recommendations

When using TLE TeachLivE™ within a preparation program a scaffolded approach to instruction and intervention is recommended. Historically, the WMU Special Education Program has implemented TLE TeachLivE™ as a tool to support developmental growth within specific and isolated courses for pre-service students. Though it is clear that use of TLE TeachLivE™ in this manner is beneficial to students, we have yet to find significance in our data that attributes student growth to participation in TLE TeachLivE™. Therefore, we recommend consideration of the following implementation model utilizing three approaches of scaffolded instruction.

Table 3 identifies each approach, defines what it is, and what it looks like in practice. First, to develop effective teaching skills we recommend the use of a development growth approach across the preparation program. This approach identifies skills to be mastered each semester, and built and reflected upon by each pre-intern throughout the program. Pre-interns will be required to chart their pre/post self-reflection scores along with ATE observation scores. This data will be reported to their instructor to ensure they are meeting the required benchmarks determined by the faculty. Second, pre-interns who are not scoring at expected levels or meeting benchmarks set by the faculty will receive one or more booster sessions. The booster sessions focus on areas of need based on the effective teaching skills in jeopardy. Third, pre-interns who do not respond to the booster sessions will be given remediation. Remediation consists of a sequence of sessions building on repeated use of effective teaching skills until mastered.

Table 3

<table>
<thead>
<tr>
<th>Intervention Model</th>
<th>What it is…</th>
<th>What it looks like…</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developmental growth</td>
<td>Regularly scheduled sessions for all students to provide scaffolded skill development.</td>
<td>Year 1: specific praise, connecting to students Year 2: specific praise, connecting to students, research based strategies, planned questioning, Year 3: specific praise, connecting to students, research based strategies, planned questioning, delivering lesson anticipatory set to closure</td>
</tr>
<tr>
<td>Booster</td>
<td>Additional TLE TeachLivE™ sessions scheduled for identified students who are not consistently mastering skill development.</td>
<td>Focus on areas of need based on observation scores indicating need for growth.</td>
</tr>
<tr>
<td>Remediation</td>
<td>Three to five additional TLE TeachLivE™ sessions</td>
<td>Explicit instruction and repeated use of effective</td>
</tr>
</tbody>
</table>
for students who are not developmentally at established benchmark periods. teaching skills until mastered.

Deep kneading of our data has allowed us to reflect on our instructional practices and the use of a virtual environment to support the instructional skills needed for real live teaching. Through this reflection, we have developed an acronym, SPARC, for focusing on the instructional skill development emphasized in the implementation of TLE TeachLivETM and then utilized in practicum settings throughout the program. The acronym represents the skills and instructional techniques students will master and implement in their preparation program. Table 4 provides the meaning of the acronym.

Table 4

| SPARC: Acronym for Skills and Instructional Techniques Acquired Across the Program |
|---|---|
| S | Specific praise |
| P | Planned questioning |
| A | Anticipatory set to closure |
| R | Research Based Strategies |
| C | Connecting to students |

By utilizing the virtual classroom, teacher educators are able to scaffold the development of effective teaching skills through multiple and repeated opportunities to practice. Teacher educators can provide real time coaching and immediate feedback in the virtual environment to assist in maximizing the performance of each pre-intern.

References

Appendix A:

This appendix contains short summaries of various ideas about the use of TLE TeachLivE™ featured weekly in the College of Education and Human Performance School of Teaching Learning and Leadership
How Can I Use TLE TeachLivETM in my Classes?

TLE TeachLivETM affords teacher educators a flexible environment for bringing teacher candidates into the virtual classroom. There are multiple models of having participants in the lab:

- **Individual Sessions**: Teacher candidates complete the session alone at a pre-scheduled time. The lab may be staffed with an expert coach to give candidates customized feedback. Conversely, the lab may only be staffed by a system operator who makes sure the system is functioning correctly, but provides no feedback. Candidates may reflect on their sessions in writing or with their class as a whole at a later date.

- **Small Group Sessions**: Teacher educators send a small group of three to five candidates to do the sessions together. This format gives the candidates an opportunity to see peers practice and discuss strategies for improvement, building collective knowledge. Candidates may rotate through the session, practicing, observing, or providing structured feedback to peers.

- **Whole Class Sessions**: If sufficient space is available, a lesson is delivered in front of an entire class with either the teacher educator or candidate as the instructor. Both formats allow the teacher educator to pause the interaction and discuss different approaches with the students.

All three models provide varying levels of scaffolded support, allowing teacher educators to choose how to customize their instruction to actively meet the needs of their learners.
Addressing Preconceptions in STEM Subjects Using Avatars

Carrie Straub, Ph.D.

Teaching to avatars gives teacher candidates and practicing teachers the opportunity to unpack content and teach it from multiple perspectives. Typically, the ability to choose the best method for delivering content is a skill refined after teaching lessons to many students, many times, over many years. This is a slow process, because teachers generally only revisit a lesson annually. Even if they teach it for three classes in a row on a particular day, they must quickly move on to tomorrow’s lesson and content. By the time another school year has elapsed, their solutions for handling student preconceptions are no longer fresh. And teacher candidates are at further disadvantage. They may receive exposure to common preconceptions in two or three methods classes. They generally do not have an opportunity to apply their learning on the spot, often waiting months or years until clinical field experiences.

However, in a virtual environment, student preconceptions can be targeted and teachers can virtually rehearse their responses at an accelerated pace. Avatars do not mind learning the same lesson over and over; they start fresh each session. Avatars show up to class to learn the most challenging topics in a discipline, and like their real-life peers, they bring preconceptions. In STEM subjects, preconceptions are commonly encountered, and veteran teachers develop a rich reservoir of approaches for confronting preconceptions. As teacher educators, you can use the virtual environment to create specific learning objectives for your students to confront preconceptions, adding immense value.

In our work with the Bill & Melinda Gates Foundation, after an analysis of 113 student work samples, we identified the top 5 preconceptions that students made and assigned them to an avatar in TLE TeachLivE™. Then we gave middle school mathematics teachers a formative assessment probe from the start of a lesson containing the preconceptions. Before the TLE TeachLivE™ session, our teachers reviewed the student work samples created by each avatar to prepare. Then, during the TLE TeachLivE™ session, teachers were confronted with the same preconceptions as they interacted with the avatars. The written work coupled with the avatar interaction provided teachers with multiple opportunities to recognize and address the preconception. Finally, they practiced teaching the lesson four times. All of this was accomplished in 50 minutes, rather than over the course of years. The benefit of time acceleration allowed the teachers to virtually rehearse and then reflect on their practice in a compressed amount of time.
STEM subjects are laden with student preconceptions. If you would like to increase your students’ ability to address preconceptions, there are simple steps you can take.

**Steps for using Avatars to Address Preconceptions:**

1. Identify research based preconceptions in your chosen content area

2. Choose three to five preconceptions that are most common for that content

3. Complete your TLE TeachLivETM Session Objective Form and explain the preconceptions you would like to see as well as the appropriate teacher responses (provide as much detail as possible)

4. Follow up with teachlive@ucf.edu to see if there are any questions about your session objectives.

Resources are available for preconceptions in your field, and as teacher educators, you may be aware of sources which would be invaluable to us at TeachLivE. Please feel free to email Dr. Carrie Straub at carrie.straub@ucf.edu with resources for preconceptions in STEM subjects that you have found to be helpful in your teacher preparation or research.
Using Video Tagging Software to Improve Teacher Practice

Teacher education faculty are interested in helping teacher candidates reflect on and improve their teaching practice. Yet, self-perceptions of performance can be very different than what really occurred. Video is an excellent way to capture classroom practice, and TLE TeachLivE™ provides a scenario, allowing candidates to record their practice in an authentic environment, without needing to gain written permission from students.

Using video of teacher practice is not new. In the Measures of Effective Teaching study, teachers recorded thousands of hours of video of themselves teaching, analyzed a brief segment of video each day, and tagged it using video coding software. Teachers reported that analyzing the video was an eye-opening experience, and tagging allowed them to use data to analyze and improve their teaching. Video tagging is also used in the sports and armed forces. Athletes and soldiers may review recorded sessions and then use the video tags to focus attention on important aspects of performance.

At UCF, we are developing a valuable tool which will allow us to tag video in our TLE TeachLivE™ virtual classroom: TeachAARS, or Teaching After-Action Review System. After-action review is a concept used in military simulators for the process that individuals engage in to debrief after a simulator session. The focus is on feedback using video recorded during the simulation. We have adopted that same technology and are beta-testing the software now to record video in TLE TeachLivE™ and tag it real-time and after recording. The initial prototype of TeachAARS is promising. The recorded video displays a split screen of the TLE TeachLivE™ classroom and the simulation participant, and after the recording is completed, the event codes (tags) can be downloaded and viewer can jump to specific events in the video for analysis. TeachAARS should be fully integrated with TLE TeachLivE™ in the fall 2013 semester. TeachAARS does require a human to operate the coding/tagging function, plans to tag video should also include a lab assistant to operate TeachAARS. Teacher education faculty can use TeachAARS for a variety of purposes.

Ways to use TeachAARS Video Coding Software in your classes:

1. **Data-driven practice:** Record instances of high quality teacher practice. Have every candidate teach the same lesson and take real-time data on teaching practice. Provide candidates with their individual scores and then show classwide-level data for comparison purposes.

2. **Self-reflection:** Create a common event that candidates must experience in TLE TeachLivE™ (e.g., CJ pulls out her cell phone). After candidates have experienced the event, have them review the recording, and submit a copy to you accompanied by a written reflection.
3. **Customized feedback by faculty**: Watch segments of your students’ recordings and provide customized feedback that is tagged to a specific event during the recording.

4. **E-portfolio videos**: Have students upload their tagged videos to LiveText as part of their teaching portfolios.

For more information about how you can use TeachAARS in your classes, contact Dr. Carrie Straub at carrie.straub@ucf.edu.
Brainstorming Session: Elsie Olan and Carrie Straub Talk TLE TeachLivE™

Teacher candidates at UCF have unique access to TLE TeachLivE™ supported by the College of Education and Human Performance. Faculty can take advantage of this resource and integrate TLE TeachLivE™ into coursework to give students opportunities to practice and reflect on concepts discussed in class. In this issue of TeLLegram, we highlight Assistant Professor Elsie Olan, Ph.D., as she integrates TLE TeachLivE™ across courses within the Language Arts elementary and secondary program. Dr. Olan worked with us to identify current syllabus activities that translate well into the virtual classroom.

Integrating TLE TeachLivE™ into Syllabi Activities

Dr. Olan planned to use TLE TeachLivE™ to practice Common Core’s new emphasis on deconstructing short, but complex, passages of text. She envisioned two activities centered on the same text, spaced over two years. Focusing on reading comprehension in year one, candidates would learn and practice a Socratic questioning strategy in class, then practice the strategy in two back-to-back 10 minute sessions in TLE TeachLivE™. Using the same text in year two, but this time focusing on writing and text structure, candidates would learn and practice a “looping” text structure strategy in class, then practice the strategy in two back-to-back sessions in TLE TeachLivE™.

Enhancing Activities with TLE TeachLivE™

Student work samples. After speaking with Dr. Olan about her plans, we looked for ways to enhance her activities in TLE TeachLivE™ and thought to include student-avatar work samples. Dr. Olan could create a formative assessment aligned with the text and work with the TLE TeachLivE™ team to create written responses from the perspective of each avatar. Candidates would get a copy of the work samples, providing an opportunity for them to analyze potential misconceptions before entering the virtual classroom as well as serving as the basis of rich, in-class discussions with peers. During the TLE TeachLivE™ session, candidates might be assessed on their ability to bring student-avatar knowledge into the lesson using a rubric.

Exit tickets. At the close of the lesson in TLE TeachLivE™, candidates could be given student-avatar exit tickets (formative assessment responses) which had been created in advance by Dr. Olan and our TLE TeachLivE™ team. The exit tickets could represent student-avatar knowledge after the lesson (e.g., Sean’s exit ticket might include a detailed response which misses the main idea, while Ed’s might contain a question for the teacher). After each of the back-to-back sessions, candidates could have a brief after action review (AAR) before returning to teach the lesson again; the focus of the AAR would be to examine the exit tickets and reflect on changes to instruction for the next session.

Student videos. Dr. Olan expressed interest in candidates being able to see themselves teaching and reflect on their practice. The TeachAARS system is integrated within TLE TeachLivE™ and can provide a video of the entire teaching simulation. Candidates could bring a thumb drive and receive a copy of their videos immediately after their sessions, which would later be edited to highlight key moments for reflection.
Next Steps
Dr. Olan plans to conduct a longitudinal research study with candidates as they complete both activities. Her next steps are to contact teachlive@ucf.edu to schedule sessions for the fall semester. She’ll also schedule time to meet with Carrie Straub, (Carrie.Straub@ucf.edu) to develop components of the research design and Morgan Russell (Morgan.Russell@ucf.edu) to develop session objectives and authentic work samples for the student-avatars.

If you are interested in learning more about integrating TLE TeachLivE™ within your syllabi activities, contact Carrie Straub at carrie.straub@ucf.edu to set up a brainstorming session. TLE TeachLivE™ provides a unique opportunity to benefit your teacher candidates.
Using TLE TeachLivE™ with a Whole Class

CEDHP has a TLE TeachLivE™ cart that allows you to use the virtual experience in your classroom with your whole class. To explain how to do this, I borrow from the past and use randomization. It was not long ago that everyone was struggling (experimenting) on the use of cooperative learning in the classroom. A former colleague in the College of Business Administration had a scheme for making sure that all students in a class participated in case studies presentations. He called it CLAM or Cooperative Learning Assessment Model. The following is an adaptation of his scheme for TLE TeachLivE™.

One key to the success of his scheme was to use randomization to assure that all students are prepared to give the presentation or to be a part of a group giving a presentation. This is true for TLE TeachLivE™ as well. Regardless of the assignment: presenting content, demonstrating a teaching strategy, using good behavior management techniques, or conferring with a parent about student’s performance, all students need to feel that they are likely to be randomly selected to give the presentation.

The class is divided into three groups: the individual who will be presenting to the avatars of TLE TeachLivE™, a group of students (3-4) who act as a peer review panel, and the remainder of the students in the class. Of course, the groups are made with little effort using the randomization process (See TeLLegram, 8/23).

The presentation occurs, and the presenter is given some time to sit and write a reflection of how he/she performed relative to the assignment objectives. While the presenter is doing that, both groups of students are busy writing their analysis of how the presenter performed. This short writing time is followed by the peer panel presenting their assessment of the performance using good mentoring processes and basing their comments on the assignments objectives. This is a professional assessment where everyone learns from the comments. While this is occurring, the larger group in the class is writing an assessment of the peer panel’s professionalism in presenting the feedback as well as the quality of the comments made. The instructor calls for the end of the writing period and randomization is used to call on people to discuss the peer panel’s efforts. All assignments are collected. Each student had their own written presentation and added reflections along the way. All of this becomes part of the completed assignment to be checked for completion. The grade for the day is given based on the performance of the peer panel. The instructor has the latitude to give higher grades than the panel to the presenter and those randomly selected to respond to the performance of the panel.

Note that the “pressure” is on the panel, not the presenter. A good performance by the presenter that receives unwarranted or inappropriate criticism, suggestions that have no basis in the literature, or excellent ideas given in a condescending manner will not lead to useful discussions about ways to improve the performance. These types of behavior would result in appropriate deductions from the grades of the panel members. Failure of the larger group to help members of the panel perform better would achieve the same results for the larger group.

This process, the TLE TeachLivE™ Assessment Model, requires all students to be prepared for participation at higher levels, fosters discussions producing deep understanding of the assignment, and encourages many, if not all students to participate in the activity.
To arrange to use the TLE TeachLivE™ cart, make an appointment for a short tutorial on how to plug in the cart and start TLE TeachLivE™. Once you have done that, you can request the cart at TeachLivE@ucf.edu. It is reserved on a first come, first served basis.
Appendix B

Current Publications or Research related to TLE TeachLivETM


Western Michigan University (2011). TeachLIVE in Demand—Not at WMU. Western Express.