The Development of Scenario-Based Simulation Modules for Online Field-Based Experiences in a School-University Partnership

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Abstract: Due to the COVID-19 pandemic, field-based instructional content was needed in a scenario-based and simulated online delivery format with our university students and school partnerships. Learning to implement teaching practices in classrooms is intricate work, requiring teacher education programs that are carefully designed in ways that help teachers learn to skillfully enact teaching practices. The goal of the pilot study described in this article was to assist the online learning life-cycle (pre-admission, enrolled, and alumni) for field-based experience student cohorts to prepare for deeper, practical engagement within a remote learning experience and facilitate greater content to application preparation to enhance online teaching and content application within our school-university partnerships.

Keywords: clinical experiences, teacher education, online teaching and learning, metacognitive strategies, cognitive load

NAPDS Nine Essentials Addressed:

- Essential 3: Professional Learning and Leading – A PDS is a context for continuous professional learning and leading for all participants, guided by need and a spirit and practice of inquiry.
- Essential 4: Reflection and Innovation – A PDS makes a shared commitment to reflective practice, responsive innovation, and generative knowledge.

The Development of Scenario-Based Simulation Modules for Online Field-Based Experiences in a School-University Partnership

In order to establish a framework for what all Educator Preparation Programs (EPPs) need to consistently prepare and develop teacher candidates into successful and accomplished classroom teachers, the American Association of Colleges for Teacher Education [AACTE] and the National Association of Professional Development Schools [NAPDS] have both published reports in recent years that operationalize clinical practice, illustrate exemplary models in the field, and identify the mutual benefits of school-university partnerships (AACTE, 2018; NAPDS, 2021; Thorpe, 2014). The efforts of the Clinical Practice Commission [CPC] Report (2018) and the 2nd edition of the NAPDS Nine Essentials (2021) aspired to elevate innovative practices, to identify needs and generate knowledge to help solve problems and use the digital environment as an inquiry-based component, and to provide a variety of contexts for embedding teaching, learning, and reflection within clinical practice and school-university partnerships for all boundary-spanning stakeholders. Due to the COVID-19 pandemic and the disruption of face to face, in person clinical experiences at Texas A&M University-Corpus Christi (TAMU-CC), a new and innovative framework had to be developed to help rethink the established practices and contexts of clinical practice in our EPP. These new practices had to be mutually beneficial for the stakeholders in the school-university partnerships, including both the university-based and the school-based teacher educators. They also needed to be sustainable throughout the pandemic and able to be maintained and replicable when clinical practice contexts were again in person. With the change to a virtual context for the field-based experiences courses, field-based instructional content was needed in a scenario-based and simulated online delivery format with our university students and school partnerships. The CPC report (2018) and the NAPDS Nine Essentials (2021) served to help us rethink the process and journey teacher candidates typically follow as they prepare to become successful teachers during this time of uncertainty. The development of the scenario-based simulation modules for our field-based experiences and the following pilot study occurred due to the boundary-spanning, third space (Bhaba, 1994) that evolved when the need for our clinical experiences rapidly moved online and a partnership formed between a professor in Instructional Design and Educational Technology (IDET) and two professors in the Educator Preparation Program at TAMU-CC.

The goal of the pilot study described in this article was to assist the online learning life-cycle (pre-admission, enrolled, & alumni) for field-based experience student cohorts to prepare for deeper, practical engagement within a remote learning experience and facilitate greater content to application preparation to enhance online teaching and content application within our school-university partnerships. The use of an immersive scenario-based environment creates an authentic learning environment and supports learner engagement. The simulation modules are able to take the simulated place and role of the face-to-face experience by incorporating real world and authentic simulated experiences crafted from face-to-face experiences and pedagogical practices that are designed to provide the learner with an alternative learning experience virtually when a face-to-face experience is not available.

As the demands upon teachers have evolved, grown, and the scrutiny increased, so have the expectations for EPPs and teacher candidates. Now more than ever, we expect our teachers to be knowledgeable, decisive, reflective, and able to promote critical thinking and problem-solving in every child (Cochran-Smith & Villegas, 2014), while explicitly contributing to our nation's economy by reducing dropout rates and developing a skilled workforce (National Commission

on Teaching and America's Future, 1996). Within this context, a gaining momentum toward improving EPPs across the nation has materialized as a way of formulating and identifying a common lexicon for EPPs in order to help produce top-quality and highly prepared teachers ready to meet the needs of an ever-growing diverse student population and with the preparation and competencies to teach in online and virtual settings appropriately and effectively.

TAMU-CC's Educator Preparation Program and Clinical Experiences

Federally designated as a Minority-Serving Institution (MSI) and Hispanic-Serving Institution (HSI), TAMU-CC is a doctoral granting university with an enrollment of more than 12,000 students (95% from the state, 48% from the region). More than 70% of students receive financial assistance, 75% work full or part-time, and 63% graduate in 6 or fewer years. As part of a broader University System, seven state agencies, and a comprehensive health science center, the university houses Research Institutions for Gulf of Mexico Studies and a Center for Gulf Coast research and policy.

TAMU-CC's guiding conceptual model for high-quality teacher preparation is centered on clinical experiences and focuses on pedagogical practices. Teacher candidates in the College of Education and Human Development seeking teacher certification, enroll in a sequence of professional development courses that consists of two semesters of clinical experience during their senior year. In the first semester, known as the field-based experience (FBE), teacher candidates are assigned to a campus in their respective grade levels and content areas where they are involved in educational endeavors through immersion in the school setting two days a week. During this semester, the teacher candidates are concurrently enrolled in a 6-hour course titled Planning, Teaching, Assessment, and Technology where both the teacher candidates and the university-based teacher educator are embedded at a partnership school. This field-based experience has a two-fold purpose: teaching seminars led by the university-based teacher educator where research-based pedagogical practices and skills are modeled and discussed and lessons in the field with their school-based teacher educator are planned and implemented. The second semester of clinical experiences culminates in a one semester clinical teaching experience where the teacher candidate is assigned to a partnership school setting five days a week. Through the collaboration of the university-based teacher educator, the school-based teacher educator, and the teacher candidate, and in alignment with PDS Essential 4: Reflection and Innovation, teacher candidates can develop effective teaching skills during this final year of clinical experiences (NAPDS, 2021).

This year-long clinical experience allows teacher candidates to demonstrate appropriate pedagogical practice in teaching key subject areas and to receive feedback from university-based and school-based teacher educators while applying theory to practice when fully immersed in a classroom setting within a partnership district and campus(es). Teacher candidates add pedagogical strategies to their repertoire relevant to the level of instruction, informed by professional feedback, to facilitate the delivery of content learning and meeting the needs of learners. Teacher candidates apply The Pedagogy Proclamation, in the AACTE's CPC report, that states "pedagogy is the science of teaching, the intentional integration of pedagogical training into an educator preparation program is the cornerstone of effective clinical practice" (AACTE, 2018, p. 16). One of this proclamation's tenets goes on to say that "the presence of strong, embedded pedagogical training is the hallmark of effective clinical educator preparation. Pedagogy serves as a guidepost for shared professional standards of best practices in teaching that in turn guide the development of clinical practice models" (AACTE, 2018, p.

16). The year-long clinical experiences of the teacher candidates in the TAMU-CC EPP is, perhaps, where the strongest presence of embedded pedagogical training takes place.

Due to Covid-19, the guiding conceptual framework of the EPP did not change, but the need for an innovative way to deliver this same level of preparation focusing on clinical experiences and pedagogical practices did. School buildings were closed, and our field-based experience course moved to a virtual platform where teacher candidates would no longer be able to be in a classroom with a cooperating teacher and school-aged students. These pedagogical competencies, and the fact that the students simultaneously take a Classroom Management course during their first semester in the field, led to the impetus of the content of our simulation module developed first for the pilot study. Although post-pandemic, teacher candidates would be back in the field in a face-to-face context, we chose to develop these online scenario-based simulation modules to allow for continued experiences in a virtual context where pedagogical practices could be developed and practiced in an online environment, knowing also that these modules could potentially meet the needs identified by stakeholders in the school-university partnership moving forward as well.

Literature Review

The scenario-based simulation modules were designed to foster strong connections with the current literature on promising practices for clinical experiences and what it means to be an effective educator preparation program within a professional development school context in a school-university partnership. There is evidence in the literature to support the assertion that online learning simulation-based environments can impact student self-efficacy and can be adapted to longstanding testing and foundational practices measuring cognitive load. Novel iterations of simulation-based learning education can also be updated to be mobile friendly, aid in enriching student feedback, and provide information on the overall learning experiences of the online learning student (Clark & Mayer, 2016). Additionally, in alignment with the recently unveiled second edition of the NAPDS nine essentials (NAPDS, 2021), key research-based concepts from Essential 3: Professional Learning and Leading and Essential 4: Reflection and Innovation were intentionally woven throughout the context, development, and implementation of the scenario-based simulation modules and are discussed throughout the article.

Student Self-Efficacy

The mechanism for agency to exercise control over one's own learning experience may indeed influence users' beliefs and influence cognitive, motivational, affective, and student self-efficacy during the learning process (Bandura, 1993). Effective cognitive load reduction frees up more mental processing power to focus on learning tasks. While additional research is needed with online simulation specific implementations in education and learning environments in general, it is possible to hypothesize that a user response to a simulated classroom environments and customized role-play environment may reduce cognitive load and promote student self-efficacy potentially positively impacting associative information processing in the process. For students to effectively adapt to procedural knowledge in near transfer, and changing knowledge scenarios in far transfer, cognitive load measurements help to shed light on simulated learning's impact on effective online learning (Clark & Mayer, 2016). By examining students' learning experiences, and cognitive load with simulated online learning environments, the proposed study herein measures if learners remember what they learned, if they can recognize and apply what they learned more effectively in their online classrooms, and if learner's utilization of a controlled failure environment has an impact on their self-efficacy and motivation. The option to

facilitate choice in the learning process may lead to greater student engagement within the online learning environment (Clark & Mayer, 2016).

Cognitive Load

Effective cognitive load reduction frees up more mental processing power to focus on learning tasks (Kirschner et al., 2019). While additional research is needed with online simulation specific implementations in education and learning environments in general, it is possible to hypothesize that a user response to a simulated classroom environment and customized role-play environment may reduce cognitive load and promote student self-efficacy, potentially positively impacting associative information processing during the learning event (Westlake, 2019). For students to effectively adapt to procedural knowledge in near transfer, and changing knowledge scenarios in far transfer, cognitive load measurements help to shed light on simulated online learning's impact. By examining students' learning experiences, and cognitive load with simulated online learning environments, the data collection measured if learners remember what they learned, if they can recognize and apply what they learned more effectively in their online classrooms, and if learner's utilization of a controlled failure environment has an impact on their self-efficacy and motivation (Janssen et al., 2009; Kirschner et al., 2019).

NASA TLX Instrument

The National Aeronautics and Space Administration's Task Load Index test, adapted from Hart and Staveland (1988) was administered to measure a multi-dimensional rating procedure and to derive an overall cognitive workload measurement. The NASA TLX instrument measures cognitive load and the impact on effective working memory utilization (Hart & Staveland, 1988). The TLX instrument is based on an average rating of user subscales: mental demands, physical demands, temporal demands, own performance, effort, and frustration (Byrda & Caldwell, 2011). The researchers have adapted this instrument and updated the index to be mobile and cross platform responsive, operating on most devices, for online learning students to provide immediate self-reported feedback upon their online simulation module completion. The TLX instrument is noteworthy because it offers a bridge that may shed light on online learning simulation-based user experiences when transforming face-to-face performative task to online digital exercises and how these adaptations may influence student participation, frustration, self-efficacy, and overall learning outcomes. Users self-report on their cognitive load by detailing their experience and immersion within a simulated online learning module and their overall interactions in the enabled context. Student subjects are then directed to rate categories to measure cognitive load including mental demands and frustration levels based on the participants reported experiences and document their experience using a modified Likert scale (Hart & Staveland, 1988). The researchers utilized an adapted NASA TLX instrument for the pilot study to measure cognitive load.

eLearning Modules/Simulations/Integration with Content

Online learning content curated and integrated for classroom instruction by experienced subject matter experts shares the common theme that it is pedagogically driven, learner centered, systematic, sustainable, accounts for instructor preparation, and considers the environment of adoption along with the practicality of implementing the technology (Knowles, 1997; Clark & Mayer, 2016). There is no one size fits all solution for online learning, and an effective

technology implementation is contingent on the andragogical, and pedagogical, constructs used to sustain instruction, learners' pre-existing knowledge, along with the instructional goals of the appropriate stakeholders. Online learning offers a vehicle to connect learners around the world wide web, and in other circumstances these same learners might not be able to meet in a traditional face to face context due to the evolving nature and uncertainty of our times. Due to the accessibility and inherent nature of online learning, students have the ability to access a compendium of curated learning content available to them anytime and anywhere from multimodal devices, learning management systems, websites, and bespoke software platforms (Clark & Mayer, 2016). Simulation based learning technology is not a new technology, and yet the teaching and learning affordances simulation-based learning can produce within an instructional setting are continuously evolving in various iterations.

Designing Pedagogical Agents

As a part of the development of the scenario-based modules, a storyboarding process was implemented to design the module. To begin this step, the teacher candidates had to create a pedagogical agent, the figure (or teacher) in the module that would deliver the content. This required them to reflect on what a teacher looks like and describe them to the instructional designer. Many have created avatars before online but knowing this would be a model for others to view and a representation of themselves led them to take more time in generating their creation. For the pilot study module, our pedagogical agent, the second grade math teacher, was a combination of the characteristics of the majority of the teacher candidates in the field-based experience course. See Figure 1 below for an example of a pedagogical learning agent.

Figure 1

Pedagogical Agent

Note. Example of a pedagogical learning agent.

Previous studies on instructional representation via pedagogical agents have illustrated that there is little to no difference in learning outcomes when the online pedagogical agent appears with facial features and gestures (Clark & Mayer, 2016). Furthermore, the agent can be a cartoon or facsimile representation provided that the simulation includes human affectations that can direct the learner to the learning content and online lesson, initiating an instructional learning event (Clark & Mayer, 2016). However, by teacher candidates creating their own pedagogical agent, based on their individual identity and culture, this allows for a relatable face in the online environment, a human component some fear will disappear with the use of simulation modules and online learning. This innovative, reflective approach (NAPDS Essential 3) to teacher candidate involvement in the design process of these modules heightens their self-efficacy and ownership in their teaching and learning (Bandura, 1993; NAPDS, 2021).

Overview and Context of the Pilot Study

This research project began as a part of a LIGHT (Learning Innovations Going Higher Team) committee organized by the Dean of the College of Education and Human Development at TAMU-CC as a way to address the upcoming lack of field-based experiences during COVID-19 with professors across discipline areas in the college. The co-creation model for these modules started as a collaboration between an Instructional Design professor and two professors teaching in the field-based experience courses for undergraduate students. The first pilot module was co-created by professors to focus on authentic learning experiences for our teacher candidates to simulate instructional choices they would encounter in the field using virtual reality and "Day in the life of ..." scenarios. As the storyboarding model was put in place, the plan evolved to have teacher candidates co-create simulation modules based on the course content and their work with their school-based teacher educator in their partnership districts. They were then able to collaborate with graduate students in instructional design who helped with the technological tools and implementation of the storyboards. These modules are based on authentic, real-life scenarios gleaned from the course by the teacher candidate and experienced by the P-12 school-based teacher educators in our school-university partnership sites.

The researchers were shown commercial tools that could simulate clinical experiences in an innovative, creative, and different form. The team decided it would be better to design their own, need-based, and standard-based modules from their years of working with the content knowledge needed and the scenarios their teacher candidates struggled with in the field. From previous needs-based assessments data collected from stakeholders in the school-university partnership districts and university-based teacher educators, the team knew that classroom management was an area where our teacher candidates, first year teachers, and even some of our school-based teacher educators struggled. Due to the history of collaboration and commitment to "simultaneous renewal," professional learning and leading (NAPDS Essential 3) occurred authentically for all involved in this pilot study and a module was created that would be mutually beneficial for all stakeholders during the pandemic and afterwards (Goodlad, 1994; NAPDS, 2021).

During the field-based experience semester where these simulation-based modules would first be introduced during the pilot study, classroom management was taught in its own three-hour course as well as embedded within the Pedagogy and Professional Responsibility Standards TAMU-CC taught as a part of the six-hour Planning, Teaching, Assessment, and Technology course. The first module designed as a part of this pilot study focused on a classroom management technique for gaining students' immediate attention during a math lesson. Besides

being identified as a need by the partnership districts, the university-based teacher educator noticed this was an area that teacher candidates had struggled with on lesson evaluations during the field-based experience semester in the past.

Because these modules employ gamification components and choice, as well as components of calculated risks and constraints, the experiences are personalized and adaptive to the needs of each student as they complete the module. These modules can be shared with both university teacher candidates and our P-12 partners. They are asynchronous so are done at an independent time and pace. They are also accessible from multiple platforms and devices, including phones, tablets, laptops, and desktop computers. Our main purpose for this pilot study was to design effective scenario-based, online modules that met both our EPP's guiding conceptual framework, our school-university partnership needs, and our required course student learning outcomes that could be utilized both pre and post pandemic. The online scenario-based simulation module created for this pilot study can be found at fbe.tamucc.edu. See also Appendix A for examples of pilot study module pages.

The three main research questions in this study were:

- How do participants think or feel about simulation based online learning and is it an effective medium for teaching and learning?
- How do participants in the sample explain motivation and cognitive impact on classroom engagement, and associative information processing?
- How does the quantitative application analytics data from the module, Qualtrics self-reported survey data, and qualitative open-ended response data converge to shed light on online learning simulation-based modules impact on associative information processing and cognitive load?

The research measured and reported on an entry level scenario based professional development online learning scenario-based module. In the era of COVID-19 online instructional resources are rapidly adjusting to an online learning reality. This research was designed to measure and report on the impacts, if any, that an immersive scenario-based learning module may have to help orient field-based teacher candidates with practical controlled failure simulated scenario-based learning. "Level 1" versions of the online module's content design will allow new and intermediate teacher candidates levelled interactions with the a Captivate developed "day-in-the-life" online orientation module. The research team investigated the overall effectiveness of the modules to prepare field-based teacher candidates for deeper, practical engagement within their remote learning experience time; provide distance-based teacher candidates greater content to application preparation at their remote settings; to enhance teaching presence by moving university-based teacher educators from content remediation to active and flipped-classroom engagement with online teacher candidates.

Participants in the pilot study who completed the simulation-based module were also awarded badges (https://tamucc.co1.qualtrics.com/jfe/form/SV_b3C9v5Alp8vbJJ3). These micro credentials were a way for the university-based teacher educator to identify and track responses of the teacher candidates enrolled in the field-based experience course as well as provide a certificate that teacher candidates and school-based teacher educators could use for documentation of professional development training.

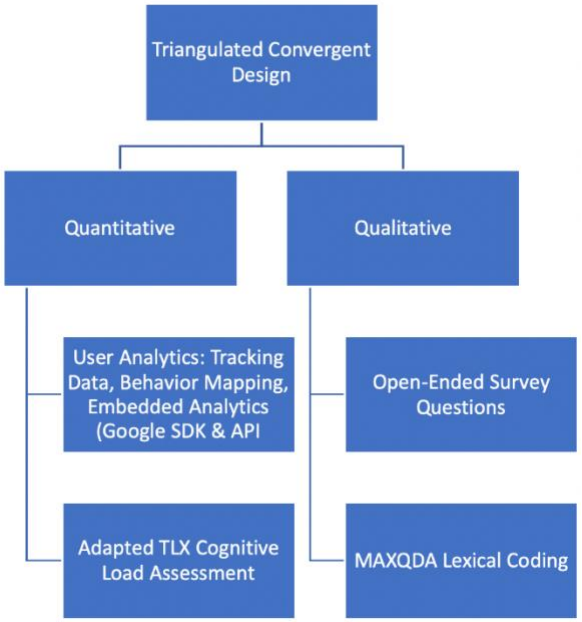
Methodology

The methodology for this study was based on a convergent mixed-method design to integrate quantitative and qualitative collections in order to better generate a more

comprehensive picture for a phenomenon by comparing multiple methodological intensities within a single research study (Creswell & Clark, 2017). The convergent mixed-method design was employed to supply an inclusive degree of triangulation: Quantitative and qualitative results are combined into a more complete understanding of a phenomenon and aid in comparing multiple levels of a phenomena within a study (Creswell & Clark, 2017). Purposeful qualitatively supplemented mixed methods research can help to capture the multifaceted nature of educational research (Hall & Ryan, 2010). Mixed method inquiry that communicates both quantitative survey data and qualitative data may aid in triangulation. A convergent design was selected to complement the quantitative data collected via surveys, TLX assessment data and the and embedded Google analytics user tracking software (Google, n.d.). A convergent sequential mixed methods design was employed for data collection to measure participants quantitative descriptive statistical user analytics data first, and then to clarify the quantitative results with in-depth qualitative open-ended survey data (Creswell & Clark, 2011). The values that qualitative inquiry encompasses acknowledges a triangulated paradigm and provides a mechanism for detailing and relating participant's personal insight into the thoughts, ideas, and complex expressions that learners have when experiencing and engaging with new learning environments and learning technologies.

Figure 2

Methodological Approach Convergent Design



The mixed-methods research design included a Qualtrics Survey on:

- Cognitive Load: Adapted from NASA's Cognitive Task Load Index (TLX) instrument (Hart & Staveland, 1988). See Appendix B.
    - Do you remember what you just learned? Can you apply what you just learned?
    - How hard was the task to learn?
    - How insecure, discouraged, irritated, stressed, and annoyed were you?
- Student Self-Efficacy:
    - Was this online simulation training effective? Or not? Please explain:
    - Do you believe that you can be successful when carrying out the simulated task in an applied setting?
    - Did you feel more or less motivated when completing the module?
- Online Modules:
    - In the era of COVID-19 do you feel supported by the online module training?
    - What are the benefits of the online training simulation?
    - What are the limitations? Please explain:

The survey can be accessed at
at https://tamucc.co1.qualtrics.com/jfe/form/SV_7VA9xhHvKRhu01T.

Participants

From August 1st through December 1st, 2020, approximately 150 users accessed the pilot study module from the learning innovation website (fbe.tamucc.edu). The website was purposely not password protected and was shared on the university website, social media pages, in multiple courses, at our School-University Partnership Conference on Education (SUPCE), and with our school-university partnership districts to allow the researchers multiple data collection points concerning accessibility, mobility, and user flow. Of these 150 users who accessed the module, we were able to collect pilot study data from 33 participants who completed an optional online survey hosted on Qualtrics after the module was completed. 24 current FBE teacher candidates, 2 prospective teacher candidates, 5 TAMU-CC alumni, and 2 community partners (n=2) started the survey. Of the initial 33 participants, 29 participants completed the entirety of the survey questions. For the survey measurement items, response rates varied from approximately 29 to 30 participants. This same rate of responses, 29 to 30, occurred for the open-ended questions on the survey as well.

Findings

Accessibility of Module Content

Boundary-spanning partnerships (NAPDS, 2021) between experts in instructional design and university-based teacher educators in clinical experiences allow space and time to generate knowledge around the needs of the stakeholders in our school-university partnerships and solve problems through a variety of digital outlets. This can lead to an increasingly organic method of accessing data and information and lowers barriers in school-university partnerships to foster an "anytime/anywhere" culture for creating an innovative environment (Bolaji & Fakomogbon, 2017; Terras & Ramsay, 2012).

Data showed that users accessed the site through a direct URL (n=172) and through the process document page S3 (n=24). The typical user flow accessed the online module directly (n=174) with some user interactions progressing to module resources and back. Multiple users

accessed the site repeatedly included with the "sessions" tracking data. Approximately 199 user sessions were recorded from August through December 2020 accessing and viewing 245 URL page views. Most users' sessions (n=174) consisted of accessing the simulation module landing page and clicking rapidly on the eLearning module. Based on the data collected, users accessed the online learning module and the online learning environment website frequently and effectively. Data indicates that the modules were easy to access from diverse platforms and from multiple locations and devices. See Appendix B for charts showing device usage and user behavior.

Quantitative Findings

Data collected about self-efficacy showed that the participants overwhelmingly (96% positively yes or probably yes) felt confident that they would be successful in carrying out the simulated task/experience in an applied face to face setting. Similarly, the cognitive load data indicated that the majority of participants found the task easy (53.3% extremely easy, 33.3% moderately easy, and 6.6% slightly easy). The question asking about level of support for the online module training during COVID-19 also had a positive response, with 97% agreeing (24% Strongly Agree, 38% Agree, and 34% Somewhat Agree) that they felt supported. 90% of participants felt slightly (28%), moderately (34%), or extremely (28%) motivated after completing the module, with only 10% motivated or unmotivated.

Data was also collected from 3 Likert scale questions ranging from a minimum of 1 to a maximum of 10. When asked, Do you remember what you just learned from the Simulation Module you completed?, the mean score was an 8.53 with 10 being you remember everything. When asked, Can you apply what you just learned?, the mean score was an 8.93. Figure 4 shows the findings when the participants were asked to rate how insecure, discouraged, irritated, stressed, and annoyed they were.

Figure 3

Survey Data Cognitive Load Results

On a Scale of 1 through 10 — 10 being very insecure; How insecure, discouraged, irritated, stressed, annoyed were you?

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Insecure	0.00	8.00	1.60	2.14	4.57	30
2	Discouraged	0.00	8.00	1.23	2.04	4.18	30
3	Irritated	0.00	9.00	1.23	2.25	5.05	30
4	Stressed	0.00	10.00	1.73	2.85	8.13	30
5	Annoyed	0.00	10.00	1.13	2.35	5.52	30

Qualitative Findings

Open-ended qualitative questions were recorded to allow participants to include additional feedback in their own voice. Magnitude coding aided the refinement process of the

open-ended survey data by outlining learner's verbal responses based on frequency and lexical word searches conducted with the mixed methods software for qualitative data analysis tool MAXQDA (VERBI Software, 2021).

Questions centered around the themes of effectiveness of the online training, motivation, and COVID support. Overall, the participants commented that the training was effective. One participant stated that "it allowed us to visually learn what is expected or can be done in a classroom setting." Another said, "The content is pertinent to my life work right now. Also, when I chose the wrong answer for the second question, it really got my attention, and I became more interested." Multiple participants shared that they learned what attention getters to use, and which ones were most effective. Two participants made the point that it reinforced what their professors had explained in class. Three participants wanted more examples given including one who would have liked a video. One participant thought the module was confusing.

When asked about motivation, many of the participants shared that after completing the module, they wished they were able to be in a classroom setting this semester. They felt motivated to try it, with one saying that she was "even more excited now to implement it in my own classroom." Another participant stated that the "module made getting the student's attention seem a lot less intimidating and manageable." Three participants connected the content to their learning from their classroom management course. Two participants said that they knew the content already and knew what to do in their classroom so were not motivated by it.

Many of the conversations during the pandemic have been about support during COVID and the concern about in person training and coursework. The data collected from the question asking of the participants felt supported by the online module training in the era of COVID-19 was mostly positive. One participant said, "Yes, I feel supported because the training is for students who cannot go to in person training or does not feel comfortable going to a training." Another shared, "I am a visual person, so this module did help me." Three participants shared their frustrations with online training, including not being able to see real teachers in person using the examples and the many different virtual learning environments they encounter with students. Two participants commented on the interactive and differentiated nature of the module saying, "this is exactly the sort of learning modality we need now."

Discussion

Using the data that we collected, we were able to glean a few things about the participants. It appeared, according to the data that the participants felt a positive impact and/or elevated sense of empowerment within and around the following areas:

- Positively impacting their professional growth and development.
- A welcoming attitude toward a different type of professional development.
- Their levels of frustration were low, citing a friendly and easy to use platform.
- An elevated level of motivation as they saw themselves in the avatar and appreciated the immediate response and feedback.
- Retention and application were both high, respectively.
- A greater sense of empowerment and support in a COVID-19 era where they felt that aspect of their learning had been greatly compromised
- An ease in applying what they had learned in the simulations to a face-to-face environment in a quick turnaround period.
- Instant gratification was present with the immediate feedback, which appeared to elevate confidence and efficacy levels

- Generated new knowledge in a boundary-spanning environment that for some simulated the face-to-face experiences.

The findings suggest that online simulation-based learning is an effective and affective medium for teaching and learning. Students responded in the affirmative that this type of instructional environment was supportive and conducive to their learning while teaching and learning in times of uncertainty. However, online learning is not a panacea and effective high-quality subject matter expertise from experienced field-based experts and pedagogical specialists is a necessary requirement for any online learning initiative to be sustainable, successful, and effective. Researchers note that this type of simulated learning when converted effectively into online training was supportive, motivating, and conducive to learning, especially during times of uncertainty.

Cognitive load is a requisite metric highlighted herein because it combines the diverse multifaceted learning nature and learning science behind completing teaching and learning tasks in an unfamiliar learning environment. Learners responded very positively to simulated online learning and related that frustration levels were low while engagement and information processing levels were high. Data indicated that the training was effective, motivating, helpful, and easy to understand in an online simulation-based format. Learners appear to be engaged with the learning and the online learning was easy to digest, but not so easy as to be ineffective.

While there are numerous examples of effective online learning finding and triangulating the necessary elements of for productive online training and learning is not as simple as collecting user analytics. Therefore, the research team sought to incorporate as many data points as possible into the collection cycle to help shed light on the impacts, if any, that a novel online learning environment may have when converting from a traditional face-to-face learning environment.

Future Implications

School and University Based Teacher Educators and Partnerships

As universities and districts continue to strengthen their partnerships, so must the reciprocal nature of the partnership grow in capacity. The professional development must be mutually identified and mutually beneficial. A true partnership should have a collective vision and understanding of the goals and aspirations of all members of the partnership. In order to do so, partners have to be included in discussions, development and design and decisions related to the EPP. The input gathered from each partner should be integrated into areas such as course design, student learning outcomes, and even classroom pedagogical practices. COVID-19 provided us with a genuine opportunity to take a closer look at what each member of the partnerships needed and desired in order to support candidates and students in an effective teaching and learning virtual/online environment. From this type of advising and discussions, EPPs are able to work collaboratively with school partnerships to develop professional development training, such as simulated modules to fill in the technological gaps as noted in NAPDS Essential 3 (NAPDS, 2021) and the AACTE Developmental Proclamation (AACTE, 2018).

The Era of Online/Virtual Teaching and Learning

One of the difficult lessons we as educators learned from COVID-19 was the hard fact that our students were not adequately prepared or ready to teach effectively in a virtual

and online platform. In other words, they felt comfortable *using* technology as aids, such as power points, Prezis, etc., but to employ technology as a partner in teaching (i.e., pedagogical practice) was something most fell well short of doing. Therefore, we had to find ways to not only provide candidates with the tools to assist in their teaching, but also with the training on how to employ those tools in an appropriate and effective way to meet the needs of the diverse populations they were working with, primarily in the area of online and virtual student diversity and competencies.

Interpretation and Integration of Technology Standards

The interpretation of technology standards has arguably been an area of discussion and debate. To this day, a number of technology standards, across the country, focus on the technical components of technology such as copyright rules, hardware, and learning management systems. While these aspects of technology are important, COVID-19 provided us the opportunity to realize that they cannot be taught in a vacuum, but rather integrated into effective application practices to better prepare candidates for the demands of effective technology integration and true application of the standards.

Conclusion

Currently, the clinical experience component of the TAMU-CC EPP provides an experiential platform to help ensure all our students are learning the essential elements necessary to become a highly-prepared teacher. Teaching seldom involves working with one student but requires that teachers design and manage classroom environments that must enable a broad range of students to learn in both face to face and online contexts. Thus, learning to use teaching practices in classrooms is intricate work, requiring educator preparation programs that are carefully designed in ways that help teachers learn to skillfully enact teaching practices. Overall, this training involves "seeing examples of each task, learning to dissect and analyze the work, watching demonstrations, then practicing under close supervision and with detailed coaching aimed at fostering improvement" (Loewenberg Ball & Forzani, 2009, pp. 497-498). Although these scenario-based simulation modules were developed to support the need for online field-based experiences, the benefits of this innovative virtual approach to learning and teaching demonstrates the need for continued use of the accessible online eLearning modules as a way to build pedagogical practices and clinical experiences throughout the EPP and the school-university partnership.

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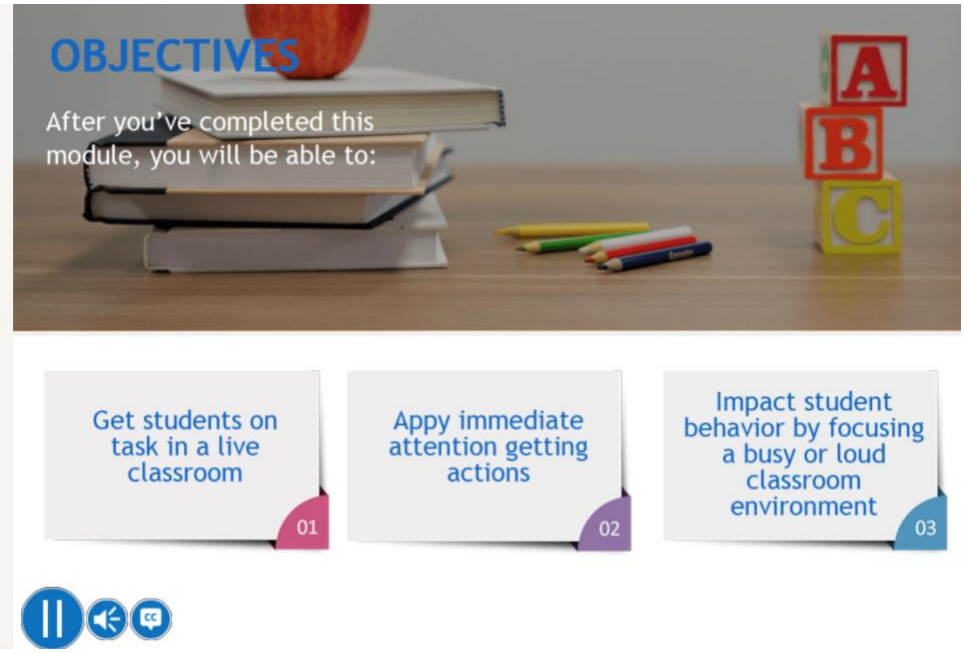
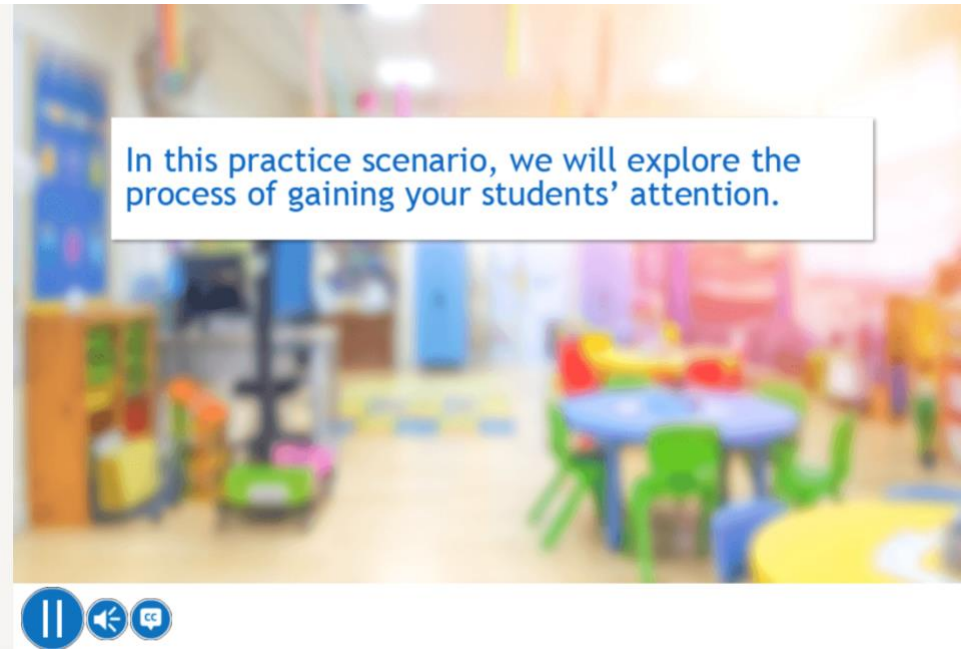
Appendices

Appendix A

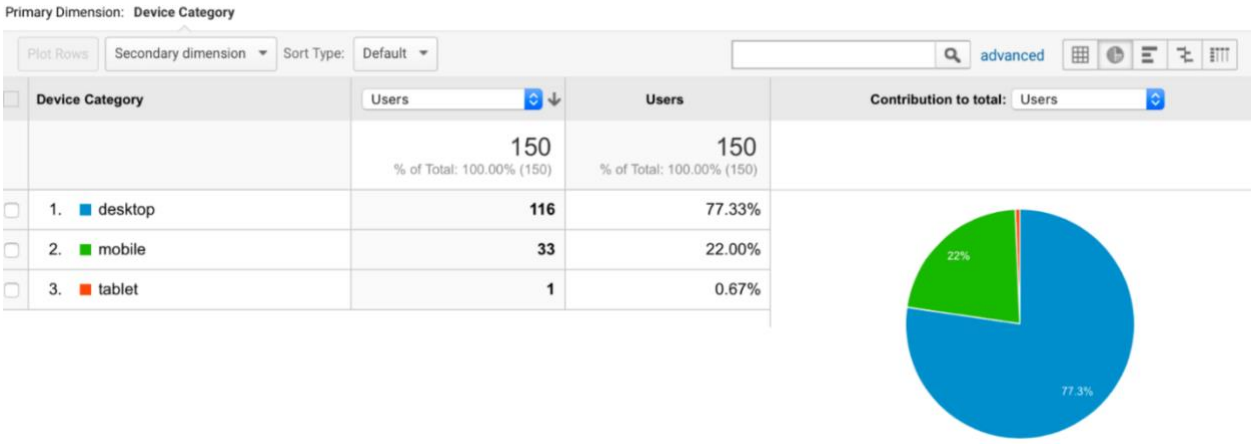
Examples of Pilot Study Module Pages



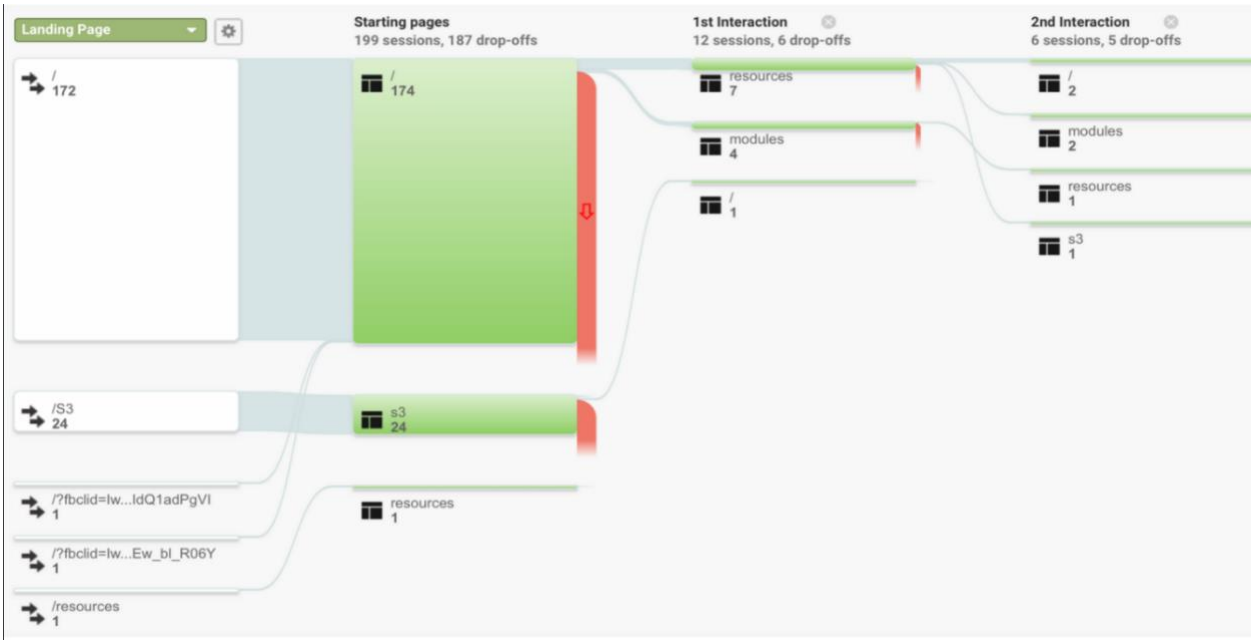


Appendix B

Module Access



User Behavior Map



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