Teacher Candidates and Audio/Visual Media in their Future Classrooms: "I Guess I Feel Prepared"

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Abstract The purpose of this investigation is to establish a snapshot of the extent one teacher educator program is preparing its teacher candidates to be ready, knowledgeable, and empowered to use technological components in their future classroom. A self-assessment inventory, online course discussion boards, and a specific audio/visual media product were used to determine teacher candidate perceptions of efficacy and preparedness for technological components in their future classrooms. This investigation is meant to stimulate a teacher educator program to evaluate its curriculum in regards to technological components taught to future teachers.

Keywords: educator preparation, technology in education, on-line teaching

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1. Introduction

By the time this article has been read, technology has changed. Our global society is bombarded with new and advanced technology that can be utilized in an educational setting, as such, it essential that teacher educator preparation programs feature as much technology for teaching and learning as possible. Initial educator preparation programs (EPP), that are responsible for grooming these teacher candidates, are now engaged in curriculum reviews in an effort to make necessary changes to the framework of their programs in order meet the ever-changing needs of technology as a teaching and learning tool [9].

Teacher candidates are encouraged to be "courageous and willing to use new methods and modes of doing things" ([12], p.93) in anticipation of increasing student achievement to master today's global learning context. This courageousness translates to utilizing a variety of technological components to teach, motivate, create, and learn in the classroom. While many technological tools are frequently used in educator preparation programs, it is determined that some teachers are willing and able to use this technology whereas some avoid it [6]. Therefore, the educator preparation programs must undertake the task of getting teacher educators to the point where they are knowledgeable, prepared, and able to incorporate various technological components in their classroom teaching.

2. Conceptual Framework

Teacher Candidates and Technology for the Classroom

Technology is a notion with origins in the French language, "technologie", which means "knowledge of application, science of application containing production methods, the tools and materials used and the ways those tools and materials are used" (TDK, 2010). Hughes [13] explains technology as using digital information communication technologies (ICTs), by educators and/or students that reinforces teaching and learning in various content areas. For this article, a compilation of the two explanations is used as a definition for technology: awareness, understanding, and application of the tools and materials used and the way those tools and materials are used by teachers and students to support teaching and learning. The current generation of students is active and adept in utilizing the Internet as a vehicle for entertainment and learning. For these tech-savvy students, the Internet is an important tool for literacy skills such as reading, writing, and communicating, not that they necessarily realize it [7,17,18]. As educators remain working in classrooms and teacher candidates prepare to enter the classrooms, they must encounter new literacies transformed by ICTs (Internet Communication Technologies) like Twitter, instant messaging and electronic books. New literacies can be explained as social practices [22] or new Discourses [11] that emerge with new technologies. In an effort to prepare and coach future educators on why technology components should play an active part of learning in the new literacies, these teacher candidates call for exposure to those new literacies. Many educator preparation programs approach teacher candidate knowledge of new literacies and of use of ICTs in a manner that is isolationist, in that only one course in the curriculum relates directly to teaching and learning with technology skills.

With the constant improvements of technology in the teaching and learning environments, how to utilize the new technologies must be on the forefront of teacher

preparation program curriculums. Technology has taken away limitations of accessing information and provided greater access to knowledge for teaching and learning. With such swift changes of technology, teachers need to be lifelong learners in order to meet the needs of their students in this global society. As such, educator preparation programs must provide learning opportunities for teacher candidates to gain and apply the knowledge, skills and attitudes necessary to keep pace with changing technology that affects their classrooms[15].

Technology Use to Promote Learning

Technology provides great promise for learning as part of an international perspective for learning. As such, it is necessary that future teachers see the promise as well. In a recent survey of 108 teacher candidates, investigators noted that 72% had a positive view of utilizing technology into their future classroom. Unfortunately, only 16% actually possessed a plan of how to actually utilize that technology so that their students could collaborate and create [21]. Business leaders state it is important that schools and teachers provide learning opportunities for students to develop 21st century skills [20]. Other significant organizations related to teaching and learning also promoted the need to learn with technology.

Technology for Teaching and Learning: An International Topic

The federal government declared that technology in teaching and learning is important when it mandated the National Technology Plan [25]. The National Council for Accreditation of Teacher Education (NCATE) stated the importance of teaching and learning with technology in their professional standards [19] and national education technology standards for teachers (NETS-T) were created by the International Society for Technology in Education [14] and later adopted by NCATE. In addition, educator preparation programs have focused on preparing teacher candidates to include audio/visual media into their lesson plans [2]. If these important groups in the educational world are supporting the inclusion of technology into teaching and learning, then teacher preparation programs need to embrace the challenge. Another international research investigation, Second Information Technology in Education Study Module 2 (SITES M2) based on the organization International Association for the Evaluation of Educational Achievement (IEA) took place using 28 research teams from Europe, Asia, Africa and North and South America. The study was designed by six scientists from the United States, The Netherlands, and Canada. This was a huge undertaking that questioned how teachers use technology in educational outcomes. One of the findings was that a majority of the ICTs utilized were mainly technological tools for planning and organizing instruction or for assessment purposes [16]. Important to note is technology for teaching and learning is an international topic as well as an American one.

Teacher Candidate Technological Preparedness and Efficacy

In this investigation, the definition of technology is awareness, understanding, and application of the tools and materials used and the way those tools and materials are used by teachers and students to support teaching and learning. As such, teacher candidates' preparation for using technology is necessary for their knowledge as well as their confidence or efficacy. Efficacy is, according to Bandura [4,5], the idea that an individual is able to carry out the actions necessary to cope with the possible situations faced with and expressing judgments. A teacher with a high self-efficacy will make grand efforts to succeed. When faced with obstacles, these teachers are persistent, confident and reluctant to give up until the obstacle has been overcome. They are tenacious, but patient because they know their students and classrooms are affected [27]. It stands to reason that teachers with high self-efficacy develop this disposition over time, but began the process while in an educator preparation program.

With ever-changing and updating of technology, teacher efficacy can be viewed as one of the most necessary dispositions in deciding how and when to use various technology in the classroom (Beas & Salanova, 2006, as cited in [8]). Technology efficacy of teachers is supported by ISTE (International Society for Technology in Education) which stated that teaching standards should include: technology literacy, use technology in classes, lead students to appropriate technology for a specific concept or skill, and create settings that afford learning opportunities with technology [14]. For teacher candidates to possess technology self-efficacy, they must attain technology literacy.

This literacy is the knowledge, ability, willingness, and skills to utilize technology for teaching and learning along with a desire to stay current with the technological changes that are frequently developed. An educator preparation program is the first contact teacher candidates make with the role of technology for a classroom. It is difficult to ignore the fact that on college campuses today most students, even non-traditional aged students, have some experience with technology; cellphones, how they registered for college classes, etc. However, most of this technological experience is personal in nature. Teacher candidates are not all prepared for the role technology plays in their professional lives or in other words, the classroom [10].

Teacher Education Programs to Promote Self-Efficacy

Teacher candidate preparation plays a role in promoting teacher technological self-efficacy. While many teacher candidates will utilize power-point presentations to support lectures or word documents to create handouts for students, it seems "teacher candidates lack the instinctive ability to effectively integrate technology into their teaching practices", [10]. As long as the technology appears to be teacher-centered, teacher candidates are proficient and willing to utilize it. Unfortunately, there seems to be a disconnect in teacher candidates' efficacy while using technology for promoting student-centered learning. Many studies were conducted to determine teacher candidates' computer self-efficacy perceptions [1].

Educator preparation programs have a role in offering their students rich learning environments with new technology knowledge and application sills. Otherwise, despite how well the curriculum is organized, the projected and desired result cannot be produced unless teachers have technology self-efficacy. Teacher candidates who are prepared in a variety of technological options are most likely to have a high technological self-efficacy along with actual knowledge and skills to incorporate and apply appropriate learning opportunities for their students.

Purpose of Investigation

The purpose of this exploratory investigation is to determine how teacher candidates perceived their preparedness and efficacy for utilizing technology in their future classrooms, this investigation examined their perceptions of preparedness in having acquired knowledge and abilities deemed important for successful use of audio/visual media in their future classrooms. Results from this investigation will increase the body of knowledge about how the educator preparation program at our university and other programs inside and outside of the United States are preparing students to feel equipped to use technology in their future classrooms.

Participants and Research Design

Fourteen junior-level teacher candidates seeking certification in the area of grades 4-8 participated in this investigation. Ten of the participants were female and four were male, however, gender was not considered in the parameters of this study. While the number of participants is small, they do represent both traditional-aged college students as well as non-traditional aged college students in the last semester before they student teach. It is important to note that the investigation was initially created to provide information regarding the role audio/visual media plays in our educator preparation program. The program is based at a public university in south Texas that mainly produces teacher candidates who are the non-traditional college student, such as females who attend classes after their own children reach school-age or for second careers. The program is delivered at two locations one in a rural area and the other a more urban area. The total number enrolled in the educator preparation program is approximately 350 at any given time. Initially, the university had been established to meet the needs of students who already had completed sixty undergraduate hours seeking a Bachelor's degree and/or a Master's degree. However, the university in the last four years was granted approval to start enrolling freshmen level students. As such, the total number in the teacher education program is expected grow.

The teacher candidates were enrolled in a literacy-based course which focused on adolescent literature and methods for incorporating such literature in the classroom. The course was totally online during a traditional sixteen week semester and each participant had previously taken at least two other online courses prior to this one.

This investigation relied on an exploratory case study approach [26] to examine the perceptions of teacher candidates' preparedness and efficacy for instructional use of teaching and learning strategies that employ audio/visual media, or technology. An empirical inquiry was necessary as the investigation was completed as a snapshot within its real-life context of teacher candidate preparation for using audio/visual media for teaching and learning in their future classrooms.

Research Questions

With the goal of exploring how prepared and knowledgeable teacher candidates were in utilizing audio/visual media in their future classrooms, so that our educator preparation program could address the preparedness and knowledge, the following research questions were developed:

RQ1: How do teacher candidates view the role and use of technology in their future classroom?

RQ1.1: What type of technology do teacher candidates plan to use in their future classrooms?

RQ2: How prepared do teacher candidates feel to utilize technology in their future classrooms?

RQ3: What role do educator preparation programs play in teacher candidate preparedness for using technology in their future classrooms?

Context of the Investigation

As researchers seek to gather and address research in the age of technology and how it relates to teachers and students, it is important for educator preparation programs to establish a snapshot of its programs' ability to move teacher candidates forward in preparing to integrate audio/visual media into teaching and learning experiences. This investigation seeks information in how our educator preparation program can best meet the needs of our teacher candidates so they not only feel prepared to utilize technology in their classrooms, but these future teachers believe they have the knowledge, ability, and efficacy to do so.

Data Sources

In order to address the research questions previously articulated, the following data sources were used: (1) a pre-course self-assessment inventory and a post-course self-assessment inventory regarding knowledge and preparedness for utilizing technology in their future classrooms, (2) course-required technology assignment creating a digital storytelling product, (3) student discussion board postings regarding the use of audio/visual media in their future classrooms.

For the pre-course self-assessment inventory and post-course self-assessment inventory, the same questionnaire was used. The six open-ended questions were designed to provide a forum for teacher candidates in the class to express their feelings and ideas regarding various aspects of technology in the classroom for teaching and learning. The following questions were used:

1. How comfortable are you with incorporating various technological components in your own learning?
2. What role do you believe technology should play in teaching?
3. What role do you believe technology should play in learning?
4. Have you heard of digital storytelling? Please respond without looking up if you are not sure.
5. How prepared do you feel you are to use various technological components in your future classroom?
6. How do you think this educator preparation program has prepared you to use various technological components in your future classroom?

The term "technological components" was used throughout the inventory and course as a means to paint a broad picture of educational technology as well as not influence the teacher candidates in any of their responses and future class discussions.

As the course was online and the focus of this investigation was teacher candidate perceptions of technological components in their future classrooms, it was important to require each candidate to create and

present a digital storytelling product, which is one form of a technological component. Digitial storytelling is described as using audio/visual media to tell a story. They can vary in length from two minutes to ten minutes, but they must stay focused on one topic or theme as the story is told. For the purposes of the course, the students were to use digital storytelling to produce a summary of the novel read for class, *Parallel Journeys* by Eleanor H. Ayer, Helen Waterford, and Alfons Heck. Students were first to read the novel, then create their own digital story as a means to entice others to read the novel. The instructions for creating the digital story were provided in text format from the instructional support center, text from the course instructor along with the following website that also had instructions (http://digitalstorytelling.coe.uh.edu/page.cfm?id=27&cid =27). This website had examples of digital stories. The course instructor also created an example of a digital story that was provided within the course. Once the students completed their digital stories, they posted them on the course discussion board for fellow students to review. Specific step-by-step textual instructions of how to use digital storytelling were provided. These instructions were in addition to the audio/visual instructions from the digital storytelling website which was also provided to the students.

The third source of data for this investigation was from the course discussion board where students were required to discuss the experiences they had while creating the digital story. The course instructor prompt was the following: Discuss your experiences while creating your digital story. Be sure to include all positive and negative experiences. Express what role, if any, digital storytelling could have on your future classroom. Please post your experiences and then respond to at least three of your classmates' postings.

From the three data sources, evidence was collected, analyzed, and explored for any patterns by the investigators. To ensure inter-rater reliability differences in patterns were discussed to either reach consensus or to reach non-consensus. Once patterns were established, they were placed in categories. All the evidence was used to make a determination regarding teacher candidate preparedness for utilizing technological components in their classrooms as well as any role the educator preparation program might have played in the candidates' perceived preparedness. As in any exploratory case study, there is the assumption of human subjectiveness in an effort to seek meaning. As such, in an effort to establish some objectivity in the data analysis, the categorical data was systematically collected and presented in narrative text. With the number of participants in this investigation, it is not likely that generalizations can be made, however, the thrust of this investigation was directed to the teacher candidates and the EPP of the research investigator.

Data Analysis

This data was significant in addressing the research questions and secondary questions described above. Postings are presented as they were presented within the digital story, discussion postings, and pre/post inventories completed before and after the audio/visual experience. No spelling or content changes were made by the investigator. Data will be presented according to emerging categories from RQ1, RQ 1.1, RQ2 and RQ3.

RQ1: *How do teacher candidates view the role and use of technology in their future classroom*?

Questions 1, 2,3 from the pre/post self-assessment inventory, the teacher candidate responses were read, coded, and categorized in an effort to develop an objective theory of how teacher candidates view the role and use of technology in their future classrooms.

1. How comfortable are you with incorporating various technological components in your own learning?
2. What role do you believe technology should play in teaching?
3. What role do you believe technology should play in learning?

Analysis of pre-inventory question 1 (How comfortable are you with incorporating various technological components in your own learning), the following two categories emerged: "I am comfortable to a point" and "I guess I feel prepared". In both questions 2 (What role do you believe technology should play in teaching?) and 3 (What role do you believe technology should play in learning?), every participant provided a positive response for using technological components in teaching and learning. Students reported that they should utilize a variety of audio/visual media, but most teachers are not equipped to do so effectively. Only two teacher candidates mentioned specific types of technology hardware that would be used in the classroom: IPADS and smart phones. One recurrent category emerged from Question 3 (What role do you believe technology should play in learning?) every response given mentioned the role of technology in learning is necessary because it is "fun".

The post self-assessment inventory questions 1, 2, and 3 were categorized for reoccurring patterns. A category emerged for question 1, the teacher candidates would consider themselves more proficient using technology for learning throughout their educator preparation program if they were given opportunities for more practice using different technolgies. A pattern for Question 2 emerged the teacher candidates provided listings of technologies they would use for teaching which included Blackboard, cell phone YouTube, ELMOs, scanners and SmartArt. For question 3 a pattern emerged where the teacher candidates indicated that use of technology for learning is "crucial, profound and important".

Every teacher candidate in the class completed the required assignment of creating a digital story for one of the assigned novels in the class. While the quality of each digital story did vary, they were all completed and able to be viewed. Two students sent emails to the instructor asking for further instructions on what to include in a digital story and one student sent three emails to the instructor because she could not get her digital story to upload. The course instructor sent this student to the technical support for the class as it seemed a student computer issue and not one related to how to complete a digital story. As each student did provide a finished product to the instructor, it is assumed no student had any difficulty understanding how to create a digital story. Also, as each student did submit a final product, it is assumed that if they had any technical trouble with the digital story, they solved it on their own or sought assistance.

RQ1.1: What type of technology do teacher candidates plan to use in their future classrooms?

Based upon the self-assessment pre/post survey, question number five (How prepared do you feel you are to use various technological components in your future classroom?), a category emerged where the following technologies were listed as option for use in classrooms; Blackboard, cell phone YouTube, ELMOs, scanners and SmartArt. A strong theme emerged coding the responses from the pre/post self-assessment survey question 5 indicating that more practice is required to be prepared to use various technological components in their future classrooms.

The course discussion board requirements had each student post at least one original thought related to how they viewed the use of technology in his/her future classroom. Each of the 14 students in the class did provide an original posting in the discussion board. Of the original postings, all fourteen teacher candidates stated they would use technology in their classroom. Four of the fourteen specifically mentioned using digital storytelling in their classrooms. The other technological components mentioned in either the original posting or the response postings were as follows: SmartBoard, ELMO, internet, and IPADS. None of the students who mentioned SmartBoards noted that it was a brand and not a technological tool of a whiteboard.

Additionally, for this research question, the following was used: questions one and four from the pre/post self-assessment. Question one was a general, open-ended question about the teacher candidates' comfort level with incorporating various technological components into your own learning. For the pre-survey, eight of the fourteen total students in the classroom provided specific examples of a technological component they use in their own learning. The following information was extrapolated from the responses: two used e-readers, one used relevant websites and slides, one mentioned the computer, two included the online course framework of BlackBoard, one utilized the cell phone, another mentioned YouTube, and one mentioned ELMOs, scanners, and projectors as well as one feature on the computer, SmartArt, but did not actually know how to use it.

The post-assessment responses to question one provided more specific examples of technological components than the pre-assessment did. Three teacher candidates mentioned BlackBoard the online course framework. The following items were each mentioned by one respondent: SmartBoard, projector, document program for creating a pamphlet (one of the course assignments), one teacher candidate mentioned all of the following: Corel, Adobe Acrobat, Fellows and Nero. Again, one person stated the IPhone. As each survey was anonymous, there is no way to know if the same people gave the same responses as in the pre-survey. The reason for anonymity was the desire for the most honest responses possible from the students. The investigator believed the teacher candidates would be more likely to give the answers they thought the instructor wanted to hear.

Survey question four specifically asked the teacher candidates about their knowledge of digital storytelling. In the pre-assessment, of the nine teacher candidates that responding to the question, six of them did not know what digital storytelling was, two said they did know what it was, but actually explained it incorrectly, and one person knew what it was and explained she knew what it was, however, she said it was only used for English Language Learners. This question was asked as a means of determining if the teacher candidates had prior knowledge of a technological application.

In the post-assessment, thirteen of the teacher candidates responded to question four. Of the thirteen who responded, ten said they did know what digital storytelling was and were able to accurate describe it. Unfortunately, three other teacher candidates either said "No" or described it incorrectly which was labeled as a "No". One stated, "It was used by fourth graders at my school, but I did not participated beyond that," and another stated, "No, I did not hear from that technological source." No further explanation was provided, so the investigator is not sure about that responses meaning.

RQ2: How prepared do teacher candidates feel to utilize technology in their future classrooms?

Using survey question number five as well as the completion of the digital storytelling assignment and discussion board posts, the following data was analyzed. In the pre-assessment a total of nine answered this question, only four respondents felt prepared to use technological components in their classrooms. Three respondents were ready to try and use technology, but they were not confident doing so. Two teacher candidates responded to the question, but their responses were not directly related to the question.

"If I was given the right instruction and training, I do not mind at all."

"I have used the SmartBoard before and I enjoyed it."

More of the teacher candidates answered question number five in the post-assessment. Nine teacher candidates reported they felt prepared to utilize technological components in their future classrooms. Three teacher candidates knew they would use technology in the classroom, but were not comfortable doing so. One respondent said, "...at this point if I'm not prepared to use certain components I will do as I always do…figure them out."

The digital storytelling assignment was completed be each teacher candidate. As each product did possess each of the specific course requirements for completion of the product, it is noted that the teacher candidates feel prepared to use digital storytelling as a technological component in their future classrooms.

- Length of digital story at least 90 seconds
- The book title and author included
- 3 Quotes from the novel that you believe to be important to the theme
- 3 Images you believe relate to the theme of the novel
- Audio: Your voice telling the story as well as music that fits the theme of the novel
- One extra item of your choosing that relates to the novel
- Cite all sources using APA

The discussion board postings were completed by each teacher candidate in the course, but not every candidate referred to his/her preparation level to use various technological components in the future classroom. Of the

ones that did address this preparation, three of them stated a level of high confidence. These three each mentioned observing in-service teachers use technology as well as various technological components had been used within their own teacher education courses. Two teacher candidates mentioned the course they were currently enrolled in and the other mentioned a specific teacher educator as one of his/her "… first professors the introduced me to the ELMO." The only other teacher candidate to post information about preparedness to use technology in the future classroom stated, "I guess I feel prepared. …it seems to me that once you have the basis for this knowledge, adaptation to future advancements shouldn't prove too difficult." No other posting referred to any level of preparedness of using technological components in the future classroom.

RQ3: What role do educator preparation programs play in teacher candidate preparedness for using technology in their future classrooms?

The pre/post self-assessment inventory and the discussion board postings were the data used for this particular research question. The specific question, number six, was used to determine the role the university educator preparation program readies its teacher candidates to utilize audio/visual media in their future classrooms. In the pre-assessment, nine of the fourteen teacher candidates completed this particular question. Of the nine respondents, four of them stated that they received no preparation from the university teacher educator preparation program (EPP). One teacher candidate states, "I have to say I have never received any preparation of training in the use of technological components from the (university). In fact, I learned by reading manuals, studying books, paid training, hands-on, and trial and error how to use technological components." One respondent believed that he/she received a little preparation and as well as one respondent believed he/she received much preparation. Three teacher candidates replied, but the responses were not directly related to the question. One example is below:

"Using the computer to read, submit assignments, even to solve mathematical assignments using different programs. I really enjoyed that program, and you can ask your instructor right away on the same problem you have an issue with."

The post-assessment inventory had a response rate of thirteen teacher candidates out of fourteen responded to question six. Five of thirteen respondents stated they had no preparation from the EPP in use technological components during their coursework. Five of the thirteen stated they had a little preparation from the EPP. Two of the thirteen believed they were well-prepared by the EPP to use technological components for their future classroom. One of the thirteen gave a response that was not directly related to the question.

The discussion board postings by the teacher candidates did not include any information regarding the EPP and its level of preparation of using audio/visual media. These discussions were focused on the teacher candidates' feelings of actually using technological components in their classrooms.

Key Findings

This study sought to establish a snapshot of an educator preparation program's effectiveness of preparing teacher candidates in their future classroom use of technology for teaching and learning. This sense of preparedness creates the foundation for the use of educational technology as well as technological efficacy. We hope by disseminating the findings of this study to other national and international teacher preparation programs, more educator credentialing institutions are will to engage in the necessary discourse surrounding teaching, learning, and technology.

While the teacher candidates in this investigation indicate they are prepared to include technology into their future classrooms and that is a good thing, they really have a false sense of technological efficacy and preparedness because they do not fully understand all that technology encompasses. Teacher-centered technology for teaching and learning such as, teacher-made powerpoints, internet, or the whiteboard, do not pose a challenge as they are devices. The teacher candidates' responses indicated they were comfortable using such tools. The concern is with application of these tools. They are not proficient in applications such as digital storytelling which is categorized as a technological application, not a device. Very few applications were even mentioned in any of the data collected especially when one of the course assignments was to create a digital story.

It is a given that teacher efficacy does develop over time spent in one's own classroom. With that said, efficacy begins in teacher educator programs. These programs need to provide their students with rich technological environments that introduce, utilize and evaluate technological devices as well as the applications for those devices. Teacher candidates who are initially equipped with a variety of technological devices and applications are more likely to establish and maintain a clear sense of efficacy.

3. Discussion and Implications for Teacher Education

Teacher education programs must continue to review and define their program curriculums and address the role technological efficacy plays in preparedness. Communication among teacher preparation programs should be substantive and continuous in an effort to prepare future educators to not only rely on technological devices for teaching and learning, but to understand and acknowledge when they may not know enough about technology. This communication should include successes and failures at curriculum, program innovations, and other information that equips future teachers to include all forms of technology in their teaching and learning. Regardless of the perspective that a teacher educator takes, it is essential to be an informed participant.

This specific educator preparation program must review each of it methodology courses in an effort to determine where teaching about and with technological devices is appropriate and where teaching about and with technological applications is appropriate. The best practices need to be identified and utilized to meet teacher candidate needs. If it is determined teacher educators are not comfortable, knowledgeable or willing to undergo this type of program review, it may be necessary to provide additional technological training for the teacher educators.

This research data supports the need for emphasis on how teacher educators prepare teacher candidates for technological efficacy. It is worth the time and discussion to improve the curriculum and instruction of how teacher candidates are prepared in terms of technological efficacy.

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