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Nontraditional Students' Perceptions and Experiences Using Technology in a Teacher Preparation Program

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
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Walden University
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Abstract

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MEd, University of Ontario Institute of Technology, 2012

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Project Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Technology integration is a key part of a 2-year teacher education program at the Canadian university; nontraditional students seemed unprepared to use technology for learning. The purpose of this study was to investigate nontraditional students' perceptions and experiences about their successes and challenges using technology in the program. The study was guided by Knowles's andragogy theory, which presents a learner-centred perspective on adult learning. The research questions focused on nontraditional students' successes and challenges using technology in coursework. A basic qualitative design was used to capture the insights of 10 purposefully selected, nontraditional university students through semistructured interviews. Themes were identified through open coding. The trustworthiness of the study was established through member checking, rich and detailed descriptions, and research reflexivity. The findings revealed that nontraditional students, especially at the start of the program, encountered difficulties learning to use new technology tools, experienced technology user unfriendliness, and struggled with a shift to online learning. The findings also showed that nontraditional students developed technology self-efficacy as they progressed through the program, aiding them in applying educational technology tools. The successes have been attributed to personal, instructor, and institutional factors as well as peer support. A white paper was developed with suggestions for streamlining the learning management system and technology tools, offering peer mentoring, enhancing technology training, and allowing extra time for technology practice. The implications for positive social change included providing insights for improving nontraditional students' learning experiences and those of their future students.

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Table of Contents

List of Tables

Section 1: The Problem

The Local Problem

Incorporating technology into daily coursework is an integral requirement for students enrolled in a 2-year teacher preparation program at a Canadian technology-focused university, hereafter referred to as X University. Consistent with a mission of the university to offer technology-enriched programs that are responsive to the needs of all learners, teacher candidates are required to use various forms of technology, including multimedia, software applications, and digital devices, on a regular basis in their coursework as stated on the website of X University. Among teacher candidates, there is a growing population of nontraditional students. According to an internal report from the study site, 36% of students enrolled in the 2-year teacher education program are nontraditional students. Nontraditional students are an important segment of the student population with unique technical skills and needs.

However, there appears to be a problem concerning nontraditional students' use of technology for learning in the teacher education program at X University. Nontraditional students in the X University teacher preparation program are often unprepared to use technology to perform learning tasks. For example, a past student stated that nontraditional students often need to seek assistance from others when using technology. Another past student reported that nontraditional students frequently require extra time to complete assigned coursework involving the use of technology. Although many nontraditional students succeed in using technology as learning tools, there appears to be a lack of understanding concerning their experiences using technology in the

teacher preparation program. A research analyst at X University stated that there is a lack of data concerning the technical challenges and successes of nontraditional students in the teacher preparation program.

The term *nontraditional student* is used to identify students over 25 years old, returning to learning after being absent from the classroom for many years (Caffarella & Daffron, 2013; Henson, 2014). One third of undergraduate students attending higher education institutions in the United States are 25 years or older (Markle, 2015). Enrollment rates between 2008 and 2019 were expected to increase 28% for adult learners between 25 to 34 years old, and 22% for students 35 and older, compared to 12% for traditional students who are 18 to 24 years old (Hussar & Bailey, 2011). With nontraditional students enrolling at postsecondary institutions at an increasing rate, it is essential for educators to understand the challenges and successes that this population of students encounter when using educational technology to support them accordingly (Henson, 2014; Li & Liu, 2013; Safford & Stinton, 2016).

Unlike traditional students who are accustomed to having digital technology infused into their learning, nontraditional students may experience feelings of anxiety due to an unfamiliar method of learning and could be intimidated and frustrated using technology for learning purposes (Li & Liu, 2013). Nontraditional students often lack technology-related skills and technical self-efficacy (Henson, 2014). It is necessary for educators to understand the unique experiences of nontraditional students regarding the use of technology to provide services based on these students' needs (Henson, 2014; Li & Liu, 2013; & Nolan & Swart, 2015).

Teacher candidates, including nontraditional students, are required to appropriately use several forms of technologies in their coursework (Nolan & Swart, 2015) and in their future classrooms to improve student learning (Aslan & Zhu, 2015). It is necessary that educators at teacher preparation institutions understand nontraditional teacher candidates' experiences using technology to better support their needs (Aslan & Zhu, 2015). Educators' responses to the technical needs of nontraditional students in a teacher education program could promote student success both academically and professionally.

Rationale

X University offers technology-enriched teacher education programs to aid teachers in integrating technology into teaching. In delivering technology-enriched learning experiences, the university provides all students with curriculum-specific software tools needed for success in students' courses and careers, as stated on the website of X University. To comply with mandates of the teacher education program accreditation granting agency, X University must support teacher candidates in using appropriate educational technologies. According to a June 2009 report by the teacher education accreditation granting agency, the agency expects that teacher candidates who graduate from X University will be able to support student learning by infusing suitable technologies into classroom practice. Based on a report by an internal department of X University, 36% of the teacher candidates at X University during the 2015–2016 academic year were nontraditional students; however, there appears to be a lack of understanding about nontraditional students' experiences using technology in the 2-year

teacher education program. Nontraditional students who are teacher candidates at X University have encountered challenges and opportunities concerning technology use in their courses. For example, past students reported that nontraditional students at the study site often require extra time to figure out how to use technology for learning and frequently need extra assistance from others when using technology in their courses. A research analyst at X University stated that there is a lack of data on the successes and challenges nontraditional students in the teacher education program might encounter regarding the infusion of technology into their learning. Considering the expectations regarding technical competencies that teacher candidates at X University are expected to meet, it becomes necessary to understand nontraditional students' experiences of learning with technology in the teacher preparation program.

Universities are required to use a variety of digital technologies in courses to support teacher candidates' development of teaching skills (Nolan & Swart, 2015). Teacher candidates, when hired as teachers, will be expected to integrate technology into their teaching to promote student learning (Aslan & Zhu, 2015). It is imperative that educators understand nontraditional students' experiences using technology to tailor support to them (Safford & Stinton, 2016; Zawacki-Richter et al., 2015). The purpose of this study was to investigate nontraditional students' perceptions and experiences about their successes and challenges using technology in a teacher education program.

Definition of Terms

Andragogy: "The art and science of helping adults learn" (Knowles, 1970, p. 43).

Computer self-efficacy: A person's belief in their computer skills (Henson, 2014).

Digital technologies: Electronic tools, systems, devices, and resources that produce, store, or process data. Digital technologies used to aid teaching and learning include social media, online games, and applications, multimedia, productivity applications, cloud computing, interoperable systems, and mobile devices (Victoria State Government, 2015).

Nontraditional student: Students over 25 years old, returning to learning after being absent from the classroom for many years (Caffarella & Daffron, 2013).

Teacher candidate: "A teacher candidate is a pre-service teacher, student teacher or trainee teacher" (Redman, 2014, p.11). For this study, a nontraditional teacher candidate is considered a nontraditional student enrolled in a teacher education program.

Technology-focused university: For the purpose of this study, a university offering technology-rich teaching and learning experiences in all courses.

Traditional student: "One who enrolls in college immediately after graduation from high school, pursues college studies on a continuous full-time basis at least during the fall and spring semesters, and completes a bachelor's degree program in four or five years at the young age of 22 or 23" (Center for Institutional Effectiveness, 2004, p. 1).

Significance of the Study

To determine how to best provide support, it is necessary for educators in higher education to understand the experiences of nontraditional students regarding their use of technology for learning (Safford & Stinton, 2016; Zawacki-Richter et al., 2015). This study may contribute to filling the gap in practice by providing insights concerning possible challenges encountered by nontraditional students and how they could become

successful in using technology to support learning. According to a research analyst at X University, at present, the study site does not have any data on the technology-related challenges and successes encountered by nontraditional students at the university in performing their coursework.

A deeper understanding of the experiences of nontraditional students regarding technology use may enable educators to enhance instruction and design learner-centered programs and services to support nontraditional students (Nolan & Swart, 2015). When educators experience an approach as part of their professional learning, it is more likely that they will be able to apply the approach more effectively in their own teaching (Darling-Hammond, 2010). If nontraditional students are more comfortable using technology in their teacher education training, they might be better positioned to subsequently integrate technology into their own teaching to enhance future students' learning.

The use of technology in classrooms can promote student engagement (Ogilvie, 2011) and the development of students' critical thinking skills (Yildiz, 2017). Critical thinking skills are essential to aid students in preparing for postsecondary education, future careers, and civic life (Gormley, 2017). Presently, technological skills are viewed as a necessary part of 21st century capabilities because these skills aid students to contribute as citizens and employees (Office of Educational Technology, 2017).

This study has potential to create positive social change. The findings of this study could be beneficial to nontraditional students who are teacher candidates, educators at the local site, and the society at large. Students who struggle in using technology to

perform coursework might gain helpful insights on strategies used by nontraditional students who are successful in using technology in their courses. The results of the study might also aid educators at the study site in gaining a better understanding of the experiences of nontraditional students and, thus, provide opportunities for enhanced instruction and more tailored programs and services to meet the technical needs of a growing population of nontraditional students. If nontraditional students are more comfortable using technology, later when hired as teachers, they could be better able to incorporate technology into their teaching to support their students. With the rapid infusion of technology into the society, it is necessary to ensure all learners develop adequate technical skills to function successfully in technology-rich learning and working environments.

Research Questions

Two main research questions guided this study. I posed the first question to provide insights into nontraditional students' experiences concerning their challenges in understanding and applying technology in a 2-year teacher preparation program at X University. The first question was also asked to gather the perceptions of nontraditional students concerning factors they believe contribute to challenges in their uses of technology. The second question was asked to provide insights into nontraditional students' experiences concerning their successes in understanding and applying technology in the teacher preparation program. Furthermore, I posed the second question to gather the perceptions of nontraditional students concerning factors they believe contribute to their successful uses of technology. The research questions were:

RQ1: What are the perceptions and experiences of nontraditional students about their challenges of understanding technology and applying technology into their coursework in a teacher education program?

RQ2: What are the perceptions and experiences of nontraditional students about their successes in understanding technology and applying technology into their coursework in a teacher education program?

I designed both research questions to be addressed through interviews with nontraditional students in the teacher education program.

Review of the Literature

In the literature review, I present an overview of the major concepts of the conceptual framework, andragogy, which was used to guide this study. Andragogy is also discussed in terms of its relevance to the study and the research questions in particular. In the literature review, I also emphasize the importance of technology to teaching and learning and explain how technology is often used and perceived by nontraditional students attending higher education institutions. The literature review was based mostly on primary source journal articles that were peer reviewed. In accessing the Walden University Library to search the SAGE and ERIC databases, I used a combination of the following search terms: *nontraditional students, adult learning, educational technology, and digital technology, education,* and *teacher candidates*.

Conceptual Framework

Andragogy, an Adult Learning Theory

Nontraditional students represent a distinct population of students attending higher education institutions (Henson, 2014). Having different postsecondary experiences than traditional students who proceed to higher education directly from high school, nontraditional students should be understood for their unique needs and responded to by educators at the institutions serving these learners. Nontraditional students' experiences and expectations should be reflected into the design of instruction provided to them. Knowles (1978) popularized the term, andragogy, in the United States. Andragogy, a term used to differentiate between learning characteristics unique to adults versus youth, is defined as "the art and science of helping adults learn" (Knowles, 1970, p. 43). Andragogy is based on the following six assumptions about adult learners: The learner

- needs to know why, what, and how they will learn;
- has an autonomous and self-directing self-concept;
- has accumulated experiences valuable to learning;
- has learning needs connected to social roles;
- is problem-centered; and
- intrinsically motivated to learn (Knowles et al., 2015).

Three of the six assumptions of andragogy were particularly relevant to the current study concerning nontraditional students' experiences using technology at X University: (a) the learner is motivated by intrinsic rather than extrinsic factors, (b) the adult learner has accumulated a reservoir of life experience that can be a rich resource for learning, and (c)

the learner has learning needs linked to their changing social roles. For this study, I developed the research questions to focus on the experiences of nontraditional students using technology, specifically the successes and challenges encountered while using technology in a teacher preparation program at a technology-focused university. With an understanding of the successes and challenges nontraditional students' experiences, adult educators can tailor technological support in line with the features of andragogy.

Intrinsic Motivation

Andragogy highlights the importance of intrinsic motivation to the adult learner (Knowles, 1970). Understanding technical challenges experienced by nontraditional students serves as a basis for educators to help reduce such obstacles, thereby potentially helping students to sustain their motivation to succeed in their program of study. To promote intrinsic motivation, nontraditional students should also be recognized for their successful use of technology and the value of their experience to the learning environment.

Role of the Learner's Experience

The role of the learner's experience is another important aspect of andragogy. According to Knowles (1970), as people grow and develop, they gain an expanding reservoir of experience that can serve as a rich resource for learning. In addition, people attach greater meaning to learning they acquire from experience than that obtained passively (Knowles, 1970). Learners should not be treated as blank slates (Bruner, 1996); adult learners want to be able to use what they know and be recognized for having that knowledge (Knowles et al., 2015).

Nontraditional students may bring varying levels of technology-related experience to the learning environment. Although some nontraditional students enter higher education institutions with limited technical skills (Henson, 2014), others might be more familiar with technology (e.g., using technology in performing their job responsibilities and for personal purposes; Henson, 2014; Safford & Stinton, 2016). Strachan and Aljabali (2015) suggested adult educators should consider how students are already using widely available digital technologies to support learning and use this insight to inform their teaching. Adult educators are encouraged to take students' prior technology experience into account when integrating technology into the curriculum. Considering the high value that adult learners place on their experiences, educators could offer nontraditional students opportunities for experiential learning opportunities involving technology use.

Adults' Learning Needs Connected to Social Roles

The andragogic ideas pertaining to adults' learning needs being connected to their social roles and the idea that adult learners have interest in immediate application of their knowledge are also relevant to nontraditional students learning with technology in teacher preparation programs. Teacher candidates are usually aware that they will be expected to apply what they learn about the use of technology into the teaching of their future students (Aslan & Zhu, 2015). With an understanding of nontraditional students' successes and challenges using technology, educators might be better positioned to support nontraditional students in ways favourable to the incorporation of technology into their future teaching. The principles of andragogy provide insights on why and how

adults learn and, hence, can be useful to educators in the design of student-centered learning activities for nontraditional students.

Andragogy and Key Research Features

Andragogy was relevant to key research features in the current study, including the research design, research questions, developments of instruments, and data analysis. Knowles (1970) suggested by applying the principles of andragogy, educators can respond to the unique interests and needs of adult learners. In this study, I used a basic qualitative design through which participants openly provided insights about their experiences using technology in the teacher education program. Andragogy also related to the research questions and the development of instruments to be used in the study. The overarching research questions focus on the technical challenges and successes of nontraditional students who are teacher candidates. An understanding of these students' technical challenges and successes in the teacher education program could aid educators to better support the students' unique needs consistent with the student-centered emphasis of andragogy. In the current study, I also used subquestions to narrow the research focus and direct data collection to include three aspects of andragogy by addressing nontraditional teacher candidates' technology uses in relation to their (a) prior life experiences, (b) social roles, and (c) motivation to learn. The three components of andragogy were also incorporated into the thematic data analysis. In reporting on the results of the study, the challenges and successes of nontraditional students in the teacher education program will be discussed in relation to principles of andragogy.

Literature Review of the Broader Problem

Importance of Technology to Education

The rapid development of technology in the society presents opportunities for increased use of technologies as learning tools (Dastjerdi, 2016; Henson, 2014; Strachan & Aljabali, 2015). Integrating technology into teaching has become a necessary requirement of learning institutions, especially for universities of technology (Nolan & Swart, 2015) and for teacher candidates (Hismanoglu, 2012). The use of educational technologies is of major importance to teacher candidates not only to enhance their own productivity but to support their future students' learning (Gill et al., 2015; Hismanoglu, 2012). Several studies have shown that the use of technology as learning tools is more beneficial to teaching and learning than traditional teaching methods (Buckenmeyer et al., 2016; Faizi et al., 2015; Rockinson-Szapkiw et al., 2013).

Rockinson-Szapkiw et al. (2013) surveyed 60 graduate students in a central Virginia university to compare traditional and web-based instructional practices to determine their effect on preservice school counselor's learning and sense of community. The findings of their study showed that students experienced a stronger sense of community and learning when using the methods involving the use of technology. Faizi et al., (2015) surveyed 382 higher education students in Morocco and found that Web 2.0 technologies have positively influenced education; 47% of the students surveyed devoted over 40% of the time they spend using Web 2.0 technologies to improve learning in various subjects. In a survey involving 491 students at a public Midwestern university concerning the use of technology and the learning process, Buckenmeyer et al. (2016)

found 94% of the respondents believed technology holds the potential to improve learning, while 84% thought technology was integral to their academic performance.

While both teachers and students should possess technological knowledge, skills, and attitudes in using technology for learning purposes, teachers have an added responsibility to ensure that technology is integrated into the curriculum alongside good teaching practices to promote learning (Aslan & Zhu, 2015). For example, technology used in meaningful ways can promote the development of communication and collaboration skills (Rockinson-Szapkiw et al., 2013). Educators at higher education institutions should be diligent in providing services to all students, particularly nontraditional students (Gordon, 2014).

Technology Use by Nontraditional Students in Higher Education

There is a growing population of nontraditional students enrolling at higher education institutions (Chen, 2014; Lambrinidis, 2014; Markle, 2015). Many nontraditional students take nontraditional routes to university (e.g., through work experience or vocational qualifications) and tend to juggle multiple roles as employee, employer, student, parent, and/or caregiver (Safford & Stinton, 2016). Having multiple roles, nontraditional students need to ensure time spent on their coursework is productive; hence, their courses should be easily navigated and otherwise well designed (Hixon et al., 2016). Henson (2014) suggested nontraditional students often experience challenges adapting to technological changes in technology-driven learning environments because many nontraditional students were previously exposed only to learning environments

before the rapid developments in digital technology and profuse infusion of technology into teaching and learning.

It is critical for adult educators to pay attention to the unique needs of nontraditional students and understand their experiences regarding their use of technology for learning purposes to determine how best to support them (Nolan & Swart, 2015; Safford & Stinton, 2016; Zawacki-Richter et al., 2015). Several scholars have reported differences between traditional and nontraditional students concerning the ease at which they use technology to support their learning (Henson, 2014; Pragg, 2015; Safford & Stinton, 2016). Henson (2014) investigated the extent to which technology-related factors affect the success of nontraditional students in two United States colleges, suggesting that in comparison to traditional students, nontraditional students tend to have lower technical skills and self-efficacy. According to Henson, nontraditional students withdrew from college at twice the rate of traditional students; however, when nontraditional students enrolled in a class, such as an introductory computer course, they completed the course at a similar rate as traditional students.

Nontraditional students have experienced challenges using technology to perform certain functions when completing learning tasks. In a mixed-method study involving 163 students, Safford and Stinton (2016) examined the challenges of blended digital vocational learning for nontraditional students. Their results revealed that nontraditional students often feel ill prepared to carry out technology-related tasks they are expected to use in their coursework (e.g., zipping files, uploading assignments, and scanning documents for e-portfolios). Consistent with these findings, Pragg (2015) reported that

older students credited technology for making learning more accessible, interactive, and convenient, while nontraditional students expressed greater dissatisfaction with technology, specifically multimedia and online learning, than their younger counterparts. Contrary to these findings that suggest differences between traditional and nontraditional students concerning the use of technology to support learning experiences, Lai and Hong (2014) surveyed 799 undergraduate students in New Zealand and found no generational differences concerning technology use pattern and learning characteristics. Jeffs and Richardson (2013) recommended that stereotyping the use of digital technology between older and younger students should be rejected. The use of technology has unique implications for nontraditional students who are teacher candidates.

Technology Use by Teacher Candidates in Teacher Preparation Programs

Teacher candidates should be able to use a wide variety of technology in ways consistent with good teaching practices to promote primary to grade 12 students' learning (Gill et al., 2015). While enrolled in teacher education programs, teacher candidates are often provided opportunities to use technology in a myriad of ways to promote their professional growth and development as well as their prospective students' learning (Henson, 2014; Milner-Bolotin, 2015; Strachan & Aljabali, 2015). Teacher candidates should have opportunities to participate in learning experiences that model effective technology integration to enhance their technology self-efficacy, support their technology skills, and promote transfer of learning into their teaching (Willis et al., 2016).

Use of Technology to Promote Growth and Development of Teacher Candidates

The use of technology in coursework in teacher education programs can promote teacher candidates' growth and development in terms of professional competencies and positive attitudes toward their subject matter (Basal, 2015; Gunther, 2016; Milner-Bolotin, 2015). Milner-Bolotin (2015) mentioned that teacher candidates can improve subject-specific pedagogical knowledge and attitudes about math and science teaching by applying technologies, such as simulations, Peer Wise system, electronic response systems, modeling software, and data collection and analysis tools. Gunther (2016) reported that using Skype, teacher candidates attained positive outcomes in terms of planning, teacher growth, and attitudes toward the teaching of reading. Panos (2015) reported that building e-portfolios as part of coursework promoted reflective teaching practices. Bullock (2013) proposed digital technologies used by teacher candidates provided opportunities for self-directed learning.

Use of Technology to Promote Student Learning

In a technology-advanced world, major emphasis is placed on students' technological skills for employment and personal use. To support student learning, technology should be used in combination with good teaching practices (McKnight et al., 2016). Appropriate use of technology in the classroom involves using technology as a learning tool to promote student-centered learning, problem solving, and critical thinking (Englund, 2017; Fei & Hung, 2016; Yildiz, 2017) and enhance student engagement and motivation (Yildiz, 2017). Effective use of technology in the classroom involves the use of technology to support all types of learners, including students with learning disabilities

(Schock & Lee, 2016). In facilitating learning for students with learning disabilities, teachers are required to support students' use of assistive technology (Schock & Lee, 2016).

Various Uses of Technology

Teachers are more and more required to harness technology in various ways to support teaching and learning (Basal, 2015; Tondeur et al., 2016). Teachers have embedded technology into instructional practice to deepen subject matter understanding. Saulsburry et al. (2015) showed how Skype, iPads, wireless keyboards, Book Creator, and Popplet can be integrated into language to create authentic learning opportunities for elementary school students. In investigating the purposes for using computers, digital mobile devices, and social media among English language learners and native English speakers, Li et al. (2015) surveyed 521 urban adolescents in a public middle school in the United States The findings revealed that younger English language learners may be more prone to use technology due to awareness of their language constraints than their native English speaker peers. Using a mixed methods design involving 27 students, Moore et al. (2016) examined resources used by English language learners to support their writing, and the impact of writing productivity software on writing proficiency. The results revealed that technological tools are frequently used by English language learners to support learning, and there are several benefits in using technology based supports such as productivity software.

Like learning language, technology has been used to stimulate learning in math including aiding students requiring special support. Thomas (2017) showed different

ways of using Screencast in elementary classrooms to facilitate meaningful mathematical discourse, make connections among mathematical representations and elicit evidence of student thinking. Shin et al. (2017) reported that alongside with effective teaching practices, virtual manipulatives can be used as instructional tools to aid students with learning disabilities develop understanding of mathematical concepts.

In addition to integrating regularly used technologies into subject areas, teachers also need to keep current with fast emerging technologies (Medzini et al., 2015). New technologies, even devices that are not specifically designed for classroom learning find their way in schools (Baert, 2015). Smartphones are popular accessories in the classroom (Clayton & Murphy, 2016). Instead of being used as classroom distractions, teachers should learn about the capacity of these devices for learning and civic engagement (Clayton & Murphy, 2016). MacCallum et al. (2017) demonstrated how mobile technology was used to improve and better support learning practices in terms of collaborative learning, connectivism, and experiential learning. Mobile technologies have been shown to promote learning during geography field trips (Medzini et al., 2015), and support feedback and student engagement (Yildiz, 2017). Teachers should be able to apply promising technologies to their local contexts to meet the learning needs of students (Svihla et al., 2015). Baert (2015) suggested uninformed teachers may incorporate technology in ways that could inhibit learning. Teachers should implement technology appropriately, in accordance with their local contexts, and varying learning needs of all learners. In addition, teachers should be able to keep abreast of opportunities for learning new technologies might present.

Integrating technology into teaching can be a rigorous task for teacher candidates. Embedding technology into teaching to promote student learning presents unique implications for teacher candidates who are nontraditional students. In addition to balancing family life, jobs, and coursework, nontraditional students who are teacher candidates must also be able to effectively apply various technologies to teaching. Teacher educators should provide tailored assistance to nontraditional teacher candidates to equip them in developing technological skills for transfer to their future students (Aslan & Zhu, 2015).

Implications

Educational research leads to some form of action to improve professional practice (Bogdan & Biklen, 2007; Caffarella & Daffron, 2013). Key findings of the current study will be used to inform project directions for improving teaching and learning. Project direction could involve designing technology-related workshops to support nontraditional students in the teacher preparation program. The program outcomes and learning objectives for the workshops would be directly connected to the results of the study.

Another direction for improving nontraditional students' educational experiences could be a recommendation to add or modify a technology course. This could involve modifying an existing course by adding content or changing the delivery methods to reflect information learned from the research. Whether a workshop is carried out or changes are made to an existing course, nontraditional teacher candidates' technological needs as identified through the study should be addressed.

Summary

The infusion of technology into coursework is a major part of a teacher preparation program at a technology-focused university. Technology, when used as learning tools, presents both challenges and opportunities for non-traditional students. An understanding of nontraditional students' experiences using technology can further aid educators in providing support tailored to the needs of students. This study was carried out to describe nontraditional students' experiences using technology in a teacher education program. The research questions focused on the challenges and successes nontraditional students encounter when using technology to support their learning. Understanding nontraditional students' experiences, educators can provide technological support to students consistent with features of Knowles's andragogy theory.

Section 2: The Methodology

Qualitative Research Design and Approach

In this study, I used a basic qualitative design to aid in developing an in-depth understanding of participants' experiences (see Creswell, 2012). A qualitative approach was an effective method for this research due to its alignment with the nature of the research questions and the research problem. The goal of this study was to gain an in-depth understanding of nontraditional teacher candidates' experiences using technology in their courses.

Rationale for Research Approach

Quantitative research involves "describing trends and explaining the relationship among variables found in the literature" (Creswell, 2012, p. 626). My intention in this study was to gain understanding of nontraditional students' experiences, not to describe trends or explain relationships among variables; therefore, a quantitative approach would have been ineffective because it would not have allowed for participants' expression of their experiences in a narrative format.

A basic qualitative study design permits an understanding of how people interpret their lives and experiences (Merriam, 2009) and focuses on meaning, understanding, and process (Merriam & Tisdell, 2015). This study design is frequently used in the field of education and is carried out when the researcher is interested in: (a) how people make sense of their experiences, (b) how people develop their worlds, and (c) the meaning they associate with their experiences (Merriam, 2009). Merriam (2009) suggested a differentiating feature distinguishing a basic qualitative design from other qualitative

designs is that other forms of studies have added dimensions. For instance, an ethnographic study involves seeking to understand interactions of individuals as well as their culture. Ethnography involves conducting an in-person field study that requires the researcher to be immersed in observing participants in a setting (Ravitch & Carl, 2016). Phenomenological studies are concerned with key factors of a phenomenon (Merriam, 2009) because phenomenology involves the essence of a lived experience of a phenomenon (Patton, 2015). Narrative studies are based on stories (Merriam, 2009).

Using a basic qualitative design, data can be collected from a single source of evidence, such as carrying out interviews, observations, or document analysis (Merriam, 2009). For this study, a basic qualitative design was a suitable approach to aid in understanding the experiences of nontraditional students regarding the use of technology. Using interviews, I gained in-depth information about the participants' perceptions and experiences concerning their uses of technology in a teacher preparation program. Other qualitative designs such as phenomenology, ethnography, and narratives that have additional dimensions were less suitable. Although a qualitative case study design allows the researcher to explore individuals or organizations from simple to complex interventions, communities, or programs (Yin, 2003), this method was also unsuitable because case studies require multiple sources of data for evidence (Yin, 2018, p.15). Case studies rely on the use of various data sources to allow different areas of the phenomenon to be revealed and understood (Baxter & Jack, 2008). A basic qualitative design was an effective design for this study.

Participants

Nontraditional students are defined as students over 25 years old returning to learning after being away from the classroom for several years (Caffarella & Daffron, 2013). I selected participants for involvement in the study based on the following criteria: (a) be approximately 25 years or older and have been away from postsecondary studies for several years upon enrollment in the teacher education program; (b) possess and be able to share key information essential to the study; and (c) offer diversity to the study in terms of race, gender, cultural background, or division of study within the teacher education program.

The participants in this study were 10 nontraditional students enrolled in a 2-year teacher education program at X University. For qualitative research, a small sample size can promote relationship building between the researcher and participant and allow for the collection of rich data (Creswell, 2012). I ensured that the sample size was large enough to attain saturation (see Creswell, 2012). Saturation is the point at which no additional information arises from the data (Guest et al., 2006). Guest et al. (2006) suggested eight to 12 interviews may be adequate for most research in which the researcher's goal is to learn about common viewpoints and experiences among a group of homogeneous participants. This suggestion is consistent with the sample size used in several studies concerning preservice teachers' experiences with the use of technology for learning (i.e., Cuhadar, 2014; Gill et al., 2015; Guest et al., 2006). Saturation occurred at eight participants in Cuhadar's (2014) study investigating preservice teachers' acceptance of tablet PCs as innovative learning tools. In research examining the

development of preservice teachers' preparedness to use Information and Communication Technology (ICT) for learning and teaching through their degree program, saturation was reached at 11 participants (Gill et al., 2015). In this study, saturation was achieved at 10 participants.

Sampling Technique

The sampling technique used in this study was maximum variation sampling, a purposeful sampling strategy. Purposeful sampling is the intentional selection of participants who possess vital knowledge or information concerning the purpose of the study (Lodico et al., 2010). In this study, participants were comfortable enough to openly discuss their experiences using technology for learning in the teacher preparation program.

Maximum variation sampling is a form of purposeful sampling in which the researcher selects participants who differ in some way (Creswell, 2012). I made deliberate attempt to include nontraditional students having different technology competency levels to maximize the diversity of the sample. Participants who best aided in understanding nontraditional students' experiences using technology in their courses and who provided a range of different perspectives concerning the research questions were selected. The participants were students from the intermediate/senior and primary/junior divisions of the teacher education program, and students from different racial and cultural backgrounds.

Accessing Participants

A researcher should access research participants in a respectful and ethical manner (Creswell, 2012). Before carrying out research, the researcher obtains permission to access participants through the research site, the individuals, and institutional review boards (IRBs; Bogdan & Biklen, 2007; Creswell, 2012). Following the guidelines of Creswell (2012) to access participants and elicit support, I made an effort to build trust with a gatekeeper. I was cooperative with the gatekeeper, administrators, staff, and participants at the study site in sharing information about the project in an open manner. To gain access to the participants in this study, I first sought permission from the dean of the teacher education program to carry out the study at X University. The dean provided me with a letter of approval to conduct the study with the students at the institution. Once I received approval for both institutions, (IRB approval # 06-05-19-0355286) I collaborated with one of the teacher candidates' professors who distributed an invitation to participate in the study on my behalf. The invitation included the informed consent form. Teacher candidates who were interested in participating in the study contacted me by email. I handled all email addresses and telephone numbers obtained from teacher candidates in a confidential manner.

I selected participants for the study based on the inclusion criteria: (a) be approximately 25 years or older and had been away from postsecondary studies for several years upon enrollment in the teacher education program; (b) possess and be able to share key information essential to the study; and (c) offer diversity to the study in terms of race, gender, cultural background, or division of study within the teacher

education program. Ten individuals expressed initial interest in participating in the study. I replied to these potential participants by email to schedule convenient meeting times for the interviews. Initially, there were less than the desired number of participants. Without sufficient volunteers, I consulted with the faculty collaborator who made the announcement to students and had them resend the study invitation letter. These efforts generated additional participants.

Protection of Participants' Rights

Upon accessing participants, it is necessary to establish a positive researcher-participant working relationship through adherence to ethical practices (Bogdan & Biklen, 2007). In seeking permission from participants, all ethical guidelines outlined by the IRB should be followed (Bogdan & Biklen, 2007). all IRB guidelines regarding informed consent and protection of participants from physical, social, legal, and economic harm were followed. Participants received complete disclosure and openness regarding the details of the study. For example, I provided information on the possible risks and benefits of participating in the study. Nontraditional students might have been concerned about potential issues arising from their involvement in this study about their experiences using technology while pursuing a degree at their learning institution. I assured participants that their identities would remain confidential throughout the study. To protect participants' confidentiality, pseudonyms, in the form of Participant 1, Participant 2, Participant 3, were used to replace participants' real names. I assigned pseudonyms by making a Microsoft Word document table with two columns containing participants' names and pseudonyms. I assigned the number one to the participant on the

first row, two to the participant on the second row, three to the third and continued in this manner until all participants were assigned pseudonyms. The table was initially stored in my password-protected PC.

Once the interviews and member checking were completed, I de-identified the participants' personal information. The interview audio recordings were transcribed and then the audio of the interviews was deleted. The digital data will be stored in an encrypted and password-protected folder on X University's Google drive. Participants' contact information, such as their names and email addresses, will be in a different encrypted and password-protected folder on the same Google drive. Consent forms and confidentiality agreements will be stored in their own encrypted and password-protected area of the drive separate from the study data. Printed copies of these documents were destroyed once digital copies were produced. At the end of 5 years, I will destroy all data collected in the study.

I also informed the participants that their participation was completely voluntary, and they could decline to participate at any time without repercussions. Before participating in the study, participants were required to sign a letter of consent that outlined the ethical considerations. The protection of participants' rights was addressed prior to any form of data collection from the participants.

Data Collection

I collected data for this study through interviews due to the nature of the research questions pertaining to nontraditional students' perceptions and experiences using technology. By using interviews, the researcher can focus on a small group of

participants and obtain in-depth information from each person (Lodico et al., 2010). In the interviews, each participant was asked open-ended questions to elicit detailed responses and probing questions for expanded responses. As suggested by Creswell (2012), I used data recording protocols to capture information during the interviews. As the researcher in this study, I was the data collection instrument. I developed the interview protocol used in the study based on the conceptual framework and research questions.

Interview Protocol

Following the guidelines of Creswell (2012), I developed the interview protocol to contain: (a) a header with key information to be recorded about each interview and reviewed with each participant, (b) open-ended questions designed to elicit answers to the two research questions, (c) probing questions to obtain additional information from participants, and (d) closing comments to wrap up the interview session. The semistructured interviews were based on seven main questions. According to Lodico et al. (2010), starting interviews with the least sensitive and most general questions can promote the building of trust and rapport with participants. The first two interview questions allowed participants to describe their general experiences as nontraditional students and explain the forms of technology they used in the teacher preparation program. The five subsequent questions were specific to the main features of the research questions concerning nontraditional students' perceptions of their challenges and successes using technology in the program. For example, in answering these questions, participants were asked to share their views about the forms of technical challenges and

successes they encountered and to discuss factors they believed contributed to these experiences.

Conducting Interviews

The interviews took place before or after the participants' scheduled class times or other times convenient to them. The duration of each semester is approximately 15 weeks, so the interviews were conducted on dates within the semester convenient to the students. A researcher should aim at carrying out interviews at a location free from distractions and conducive to audiotaping (Creswell, 2012). I had planned on conducting the interviews in a reserved meeting room, a private space located in the library at X University to allow for participants' comfort and confidentiality. However, due to the COVID-19 pandemic restrictions, I carried out the interviews by telephone using a private home office. To further ensure confidentiality, prior to the start of each interview session, each participant was asked to read and sign the consent form.

Based on the suggestion of Lodico et al. (2010), I interviewed participants individually to aid relationship building, allow participants to use their own words concerning their experiences, and provide an opportunity to explore each participant's responses in-depth. The interviews were semistructured (see Appendix C). Following the suggestion of Creswell (2012), the interview protocol contained seven open-ended questions to encourage the participants to provide detailed responses from their own perspectives. I used the prepared interview questions to elicit responses to the research questions about nontraditional students' experiences in terms of challenges and successes encountered in using technology in the teacher preparation program. Probing questions

were asked to clarify a participant's understanding and explore issues. The duration of each interview was proximately 20–120 minutes. I audio recorded each interview session from start to finish using a digital voice recorder.

Role of Researcher

I served as the interviewer in the study. I did not hold any professional position at the research site and did not know the participants who were involved in the study. In the past, I was a student at the university and had graduated several years ago, so the current staff and students were not familiar to me. Data were collected on an ongoing basis along with data analysis.

Data Analysis

Data analysis was done through coding with thematic analysis. At the end of each interview, the audio-recorded data were transcribed with the assistance of NVivo data transcription service. Pseudonyms in the form of numbers (one, two, etcetera) were assigned to each transcript to protect participants' confidentiality. Qualitative data analysis begins with exploring the data to get a general understanding of the data (Creswell, 2012). To begin analyzing the data of this study, I first read through and reviewed the interview transcripts from start to finish repeatedly to get an understanding of the data. Merriam (2009) asserted the researcher should place notes beside segments of the data deemed to be important, interesting, or potentially relevant for answering the research questions. The process of placing notes beside bits of data considered relevant to the study is called coding (Merriam, 2009). Coding is a process that aids the researcher in making sense out of text data, and identifying themes (Creswell, 2012). I inserted notes

of the main ideas relevant to research questions and the central phenomenon in the margins of meaningful sections throughout the interview scripts. Creswell (2012) suggested reducing the initial list of codes to a smaller, more manageable number such as 25-30 codes by merging similar codes and checking for redundant codes. Creswell recommended that researchers should identify codes that appear to fit together to describe an idea and should aim to derive five to seven themes from the codes. I proceeded to make sense of the data by reviewing the notes placed in the margins of the text.

Following the guidelines of Creswell (2012), I refined the coding process, and formed six themes from about 30 codes. To form themes, related codes were drawn together; I created groupings of codes similar in nature. A grouping constitutes codes sorted and put together based on shared characteristics. The groupings were formed by combining all data relating to an issue. I derived themes from groupings of related codes to capture the main concepts of the data in relation to nontraditional students' experiences using technology in a teacher preparation program. Each grouping of related codes represented one theme. One grouping of four to six related codes was condensed into one theme. To identify each theme, I chose a label that encapsulated the common features of all codes within a particular grouping. The data contained in each coded group were reviewed several times to determine if new groupings should be formed or if the data needed to be removed from the existing groups.

Creswell (2012) proposed the researcher build and describe themes to aid detailed understanding of the main issue being investigated and answering the research questions. I used the themes to answer the research questions. I used the themes to provide a

narrative discussion about nontraditional teacher candidate's experiences using technology in their teacher education program. Participants' quotes and examples from the data were incorporated to provide voice of the participants and help explain the themes.

In analyzing data, an effort was made to ensure the nontraditional students' perceptions were accurately represented in the conclusions drawn. Credibility pertains to the truthfulness of the research findings (Lodico et al., 2010). Credibility and transferability aid in determining the trustworthiness of a study. Procedures for ensuring accuracy and credibility of the findings included member checking, and personal critical reflection.

To promote credibility, the qualitative researcher can perform member checking to capture participants' beliefs, views, and experiences. Member checking is a process in which the researcher asks one or more participants to verify the accuracy of the account (Creswell, 2012). Member checks ensure participants' perspectives portrayed in the findings are not skewed by the researcher's personal biases. In performing member checking, I sent each participant their transcribed interview and a summary of my interpretation of their interview for review. I adjusted the summaries based on feedback provided by the participants. Throughout data analysis, I critically reflected on how my personal assumptions and possible biases might affect representation of the data. Based on the outcomes of these efforts, the themes will be reviewed. As suggested by Creswell (2012), thematic revisions continued until no new themes were observed. It is essential that the researcher provides a realistic presentation of the data by not only presenting one

side or the other (Creswell, 2012). To determine transferability, I included rich descriptions about the participants' responses and circumstances to provide sufficient details about the study to aid readers in determining whether the findings might be applied to other contexts.

Examining discrepant cases is a key part of qualitative data analysis to capture the complexity of situations and promote credibility. Data that cannot be accounted for by a proposed interpretation can reveal flaws in that account, even though the discrepant case itself must be examined for threats to validity (Maxwell, 2004). Maxwell (2004) recommended researchers assess both supporting and discrepant data to determine whether it is more plausible to keep or change the conclusion. In this study, I ensured that nontraditional teacher candidates' technical experiences were accurately represented in the findings. The data were examined for discrepant cases. There were no discrepant data found in this study.

Results of Study

Theme 1: Challenges With Online Learning

At X University, the teacher preparation program is predominantly offered through an in-person format however, due to the COVID-19 pandemic there was an expansion in the online format of course delivery. Pertaining to the first research question, nontraditional students revealed they encountered challenges with online learning. Specifically, difficulties using videoconferencing platforms, internet connectivity issues, and inconveniences associated with group work for completing assignments were identified and addressed. While the online videoconferencing software,

Adobe Connect, offered a wide range of features to support teaching and learning, students encountered problems with the application. Often, during classes, there were bandwidth issues with Adobe Connect, for example, service disruptions if several students had their cameras on at the same time during a synchronous session. Participant 1 commented,

> I understand why they would use a program like Adobe Connect; it offers such a robust way of teaching; there's so much you can do in the program but not everyone has access to high speed internet that works for those programs.

Participant 5 stated,

> So there were times where I would be in class and I was like okay, it's so much easier if I don't have my camera on, and I'm not uploading the live footage of my face or whatever, and I'd just talk instead of actually having my video on – that would let everything freeze up

Students also reported glitches with the hand raise reaction feature as well as sound problems. Participant 9 commented, "We often hear a ringing, screeching sound, an echo, sounding too fast or too slow; you might not even be aware there was an issue until classmates tell you what they are hearing."

It appears due to the challenges with Adobe Connect, some professors had switched to Zoom, however, students still had issues with internet connectivity, especially if accessing the classes from rural areas having limited internet speed or availability. Participant 1 stated, "The problem is the connectivity. I live in the country and we have real connection issues, so I'm constantly running out of data because we

don't have unlimited data." Other factors affecting network stability were windy weather conditions causing damage to internet network service equipment and high network traffic. Some students had to change their location to be able to access online classes. Participant 5 declared,

> I live in a rural town, in a rural town you have one internet provider, I think the back-hoe went into the tower and the internet was out…and then during the really bad windstorm, we were out of aerial receiver – it's an aerial tower and the tower kind of blew over. I did end up having to go somewhere else with reliable internet (Participant 5).

On a similar note, Participant 1 described having to go to the home of family members in order to use their internet. Participant 1 suggested that,

> Of course because of Covid, I had to go in their basement… because I didn't want to expose them, right. And of course, there's tons of hot spots on my phone which has driven up my phone bill because I've had to use the data there because we've run out of internet at home (Participant 1).

Participant 10 stated, "Sometimes I have issues connecting or get kicked out of class because of my unstable internet; I live in a little more rural area so we don't even have unlimited internet here." Participant 2 offered another explanation for internet connectivity issues. Participant 2 confirmed that

> When it was a lockdown, the whole neighborhood, with online people working from home, it was a big strain on the internet connection. I had many lectures, it

> was just cutting out or if you don't close your cameras you're not able to listen to what the professor is saying, right, it was a struggle (Participant 2).

Participant 6, described challenges in trying to access an 8:10 am online class as:

> My computer has to turn on. Ok, well today it is taking longer, and its 8:05 am and I'm freaking out. My computer doesn't load or my internet is spotty. I can't hear, I can't see them. Great. Well, now my computer is still loading, and I'm sweating like you know, when you don't know where you're going in a (physical) classroom, and you know you've got to be in class in five minutes and you're trying to find the room in the university that you're supposed to be in. It's exactly the same thing, but there's a piece there that I have no control over, so my tools in my toolbox to troubleshoot the technological component are few. When I'm running through those hallways in the school, I can ask someone for help, I can look at the building plan, I can plan ahead……. but if all of a sudden Zoom decides not to load on my computer…I don't have as many tools to troubleshoot the technological component, so it causes me more stress (Participant 6).

Participant 5 highlighted that it was more challenging to get technical support from classmates in the online environment than in the in person classes. Participant 5 stated that,

> If I was actually in a (in-person) class with the person, I'd be like I don't quite know. They'd be able to go and show me, bring their computer up to mine, and be like ok, first do this; I think that was a big help (Participant 5).

Students also revealed they felt the online learning format presented challenges with assignments that involved group work due a lack of opportunities for in-person social interaction to promote relationship building among peers. Moreover, internet connection issues affected some classmates' access to, and participation in meetings when completing group assignments. Participant 8 stated, "There is a lot of group work within the program, and making sure that everyone in your group kind of is able to communicate effectively can be a barrier." Regarding group work in the online learning environment, Participant 10 remarked,

> One big challenge for me is the amount of group work and the lack of communication with my classmates, and being able to form a group; it's challenging. I find another thing is not having that social interaction that I would usually have like a bit of a study group or meet here in the library to study for that (Participant 10).

Referring to experiences during the first few weeks of program when due to the pandemic, the institution was required to abruptly switch the first semester to online learning instead of face-to-face classes, Participant 6 disclosed,

> I was mourning the loss of what I thought this could be because when you're in person with people, you know, it's different when you go for coffee, or go for a walk. They'd (professors) you know, would be like, okay, pick your group for an assignment, and I'd be like I don't know anybody (Participant 6).

Theme 2: Difficulties Using Educational Technology Tools

This theme relates to the first research question. Incorporating technology into coursework in teacher education programs can aid teacher candidates' growth and development concerning professional competencies and positive attitudes toward their subject matter (Gunther, 2016). Technology is vigorously incorporated into the courses in the teacher preparation program at the university. In particular, there are two technology-focused courses, one is a digital literacy course while the other course addresses learning in digital contexts. The digital literacy technology standalone course provides an introduction to a wide range of technological teaching and learning tools. The course offers an opportunity for students to experiment with technology tools which could be applied to assignments for other courses in the program, and teacher candidates could subsequently use these tools in teaching.

Nontraditional students described their experiences trying to become comfortable using a wide range of new technologies in the program. Before entering the program, the students anticipated technology would be an integral part of their learning at the institution, however, particularly for students who felt they were out of touch with technology, the high level of technology infusion during the first semester was a daunting experience. Participant 1, explained,

> During the first few months of the program, I felt overwhelmed and stressed not due to the (subject matter) itself, but the challenges with technology. I remember the first couple of months feeling overwhelmed and like I didn't know what I was doing, and kind of floundering blindly. I felt the class was moving at a fast pace

> and I was always a step behind. I was never able to complete the technology parts of the tasks as quickly as the traditional students. It would take me 3 times as long; they would have theirs done and I'd be still on the first page.

In explaining why the technical challenges were happening, Participant 1 stated,

> I think it's my own level of being out of touch… I think the biggest hurdle is just learning to overcome, you know, like kind of not to think paper and pen but to think what can the computer do for me and then, I realize oh my goodness, this program can do this for me and that makes my life easier. So I don't naturally think what are the shortcuts, and what the program can do for me, I think ok, what do I have to produce (Participant 1).

Participant 2 commented,

> I think the first three weeks were hard, and all of us like the whole program and the new things were quite time consuming to learn, you just see what each professor would do at the beginning of the course, they (professors) would tell us where to find stuff, how to find stuff, that will be here, I'm expecting that. so in a way everyone was doing their tour. It wasn't that it was left on us to learn new things, not being helped from the beginning. But, I remember everyone was anxious and stressed about the beginning…..for me it's just the challenge of learning the new tool, not like I'm really, really challenged with technology (Participant 2).

Referring to personal experiences at the start of the program, Participant 5 explained,

> I didn't know a whole lot about technology, I was like okay, I can hook up my TV and the connections, Wi-Fi stuff and what not, so I'm pretty sure I can handle this; (but learning with technology) was intimidating at first (Participant 5).

In discussing feeling out of touch with technology during the first few weeks of the program, Participant 10 revealed, "I never really considered myself a tech savvy person." Nontraditional students revealed that at the beginning of the program, certain areas of technology were particularly challenging for them.

Table 1

Main Areas of Technical Challenges at the Beginning of the Program

Challenges encountered	Example quote
Understanding Google Drive	Participant 7: "I did not know how to share documents on Google Drive."
Learning to use and apply new tools	Participant 8: I've definitely faced some challenges trying to adapt to new software that are required for certain assignments."
Using social media for educational purposes	Participant 3: "I'm not a social media person."

Some nontraditional students were familiar with the Google Drive before entering the program, while others struggled with creating, sharing, and storing documents in the Google Drive. Participant 6 described initial challenges using the Google Dive in the

program as “feeling out of your element” in switching from Microsoft Word, PowerPoint, and Excel to Google Docs, Slides, and Sheets. Participant 10 revealed,

> I was a little slower in September, I had never used Google Drive. So I was unaware that all the Google Docs we were using were stored in the drive. I had to ask my classmates to send me the link……. little things like that, I had never used Google Drive, and I don’t know if that’s because I’m a mature student or just because I didn’t have much interest in that (Participant 10).

Participant 7 revealed, “I didn’t know how to share documents on Google Drive.” Participant 3 disclosed, “There was Google and Google Drive, and those were the things I wasn’t used to, but then, I figured those things out and sorted out what was what.” Teacher candidates enrolled in the teacher preparation program are required to use a plethora of technological tools to support teaching and learning such as: Wix, Scratch, Kahoot, Jamboard, Pear Deck, Answer Garden, Piktochart, Audacity, Bubble.us, Padlet, and Lindt. Nontraditional students, especially students who felt out of touch with technology upon entering the program, reported that they initially felt overwhelmed by the wide variety of tech tools and struggled with learning how to use the tools. Making videos, creating interactive websites, and coding were among the tasks nontraditional students found challenging. Participant 5 stated,

> We learned how to go and make a website, we had to do that for some of our assignments; they had to be our own website and (we had to) upload things. We had to learn to make videos, that one I didn’t like doing. I think it was because of

> the program I was using; it didn't make sense to my brain but somebody introduced me to another program and that worked way better (Participant 5).

Participant 1 described challenges in creating a website as,

> We had to put together a website, I knew the basics, like Microsoft office, and that was it. All this new technology felt really, really overwhelming. In the first term we had a digital literacy course which was good because that enabled us to experiment different technology teaching tools. Because it was in the context of so many other courses, I felt it was hard to have the time to dive in and really get comfortable.

Participant 2 remarked,

> I have to say at the beginning, there was a bit of challenge to learn about Wix…. I'm not really, really challenged with technology… for me it's mainly the learning curve, like how long it takes to learn this, I'd say the one thing I'm still working on is coding. It takes time – you're creating a functional code that you're trying to learn.

On coding, Participant 5 remarked, "Coding is in the curriculum right now so I think a lot of teachers are worried about it."

Students were also required to use social media for educational purposes, which also presented challenges. Commenting on the use of social media in the program, Participant 3 stated, "One thing that intimidates me is still social media, I'm not a social media person," while Participant 1 commented, "So they use Twitter, I'm not a big twitter user."

Theme 3: Barriers to Technology User Friendliness

This theme also addresses the first research question. Nontraditional students expressed encountering user unfriendliness issues concerning technology use in few areas, especially at the beginning of the teacher preparation program. Challenges arose when navigating the program learning platform, when using certain types of computer hardware or browsers and printing issues. Concerning navigation of platforms, Participant 3 explained there were different platforms for different portals requiring different login passwords.

> I was trying to log in with the wrong password. Everything had its own separate login; we have a portal for practicum, Canvas, the network, library, everything had its own separate login. It might be helpful to have everything in one place… to have a more streamlined access.

Nontraditional students also indicated that the location of course materials within the platform varied from one course to the next. Students revealed that in setting up their individual courses, professors may opt to place course materials and information into different sections on the Learning Management System (LMS). Nontraditional students suggested to help out students in finding materials easier, professors could consider placing specific materials at the same location on the LMS throughout the program to allow for easy access.

Participant 3 commented,

> I think instructors have the ability to put different types of headings in different places…. It would be nice to have okay, everybody puts that on the

> announcement, the homepage of the class. So, instead of having to open a syllabus and then find the link, so they can have a structure that's consistent within the program.

Participant 6 explained, "You know some professors give you a Word document to access the slides and the PowerPoint and the assignments. Others put it under something else." Participant 10 commented that it helps to have a general format across the different courses throughout the program concerning "where your work is supposed to be and where deadlines are posted"; the participant also revealed that the challenges locating course items were mainly experienced at the beginning of the program. To a less extent, another challenge pertained to printing issues requiring visits to the technology help desk at the university.

Regarding hardware challenges, some students stated they needed to replace the laptops they originally brought into the program with newer devices that had robust capabilities for handling the software applications and programs requirements for completing coursework. Participant 1 commented,

> The original little laptop I had was oh my goodness, it was like a little tablet, and it just did not have the robustness that I needed to be able to use all those different programs, so I had to purchase a new laptop.

Similarly, Participant 8 explained, "For this program, I actually did end up buying a new laptop because I find that you do need a pretty new and updated laptop to be able to do all the things." There were also instances of incompatibility between students' browsers and certain websites, or software programs used in the courses.

Theme 4: Online Learning Successes

This theme pertains to the second research question. Nontraditional students revealed they gradually became more comfortable with online learning as their program progressed. Students became familiar with the features of the online learning platforms and were able to access information faster and easier in virtual classes over time. At the university, technology is used in ways that provided opportunities for students to be collaborative. Participant 3 remarked, "Although I was not usually a proponent of collaborative work, I now look forward to collaborative projects." Working collaboratively online, nontraditional students shared ideas and felt they achieved deeper, richer learning experiences. As nontraditional students progressed through the program, they indicated they felt comfortable conducting virtual meetings including teaching online. Participant 3, stated, "I'm not afraid of teaching online…. during practicum, when teaching online, I was able to create fun activities and got students engaged into discussions and asking questions even when they were not on camera."

Participant 1 stated, "I'm able to start and initiate, you know, online virtual meetings and screen share. I've gotten really adept with all the whole entire Google platform, like Google Meet, Google Classroom, Google Sites." Nontraditional students also expressed that they have had success carrying out group work in the online learning environment.

> I remember like in university (a prior program) ……group work was challenging. When you have four people or five people in the same group to have, you know, at the same time be free at the same time. So now, it's actually easier because we

> really don't need to be physically in the same place. We can just do it wherever, we are online.

Participant 7 stated. Participant 3 disclosed,

> We've still maintained a high level of collaboration, and maybe even higher because we've been forced to go with technology……You used to say, oh, when are you available to meet, and we would meet up physically, because it was a comfortable thing to do right? And I actually find its more effective than that because you're sort of in your own space and you're working on the document and you're working together and pulling everything together.

In discussing successful uses of technology, Participant 4 stated, "I utilized technology in many ways throughout my time in the program. The one key feature is being able to collaborate with peers and not being in the same room or city."

Theme 5: Successes in Using Educational Technology Tools

This theme addresses the second research question. While a majority of participants struggled, others revealed they found technology to be less challenging at the beginning of the program. Participant 4, who found technology to be less challenging at the beginning of program stated, "There have been no challenges per say, more (about) becoming familiar with applications or programs that I had never experienced before. It's more about having a positive mindset while learning new technologies." On a similar note, in describing experiences with technology during the first semester, Participant 3 shared their perspective as, "I don't think I ever wanted to throw my computer out of the window so that's a good thing."

Nontraditional students described growth in their learning concerning the use of educational technologies as they advanced through the program. Students appeared to be especially proud about being able to apply technology tools during their student teaching practicums. Participant 6 explained, “I (now) have a good grasp of Google Drive, I understand what it is supposed to do and how it stores information though there’s still more to learn about its features.” On a similar note, Participant 3 stated, “I figured out how to use Google, and Google Drive…, I enjoy working collaboratively with others on Google Docs.” Participant 2 expressed feeling proud about being able to use educational technology tools to create a digital learning portfolio, infographics, and to build an interactive website to teach a lesson. Participant 2 further stated, “I’ve used cartoon maker twice in the classroom (while on practicum) with my students; I put up the cartoon and they’re like, ohhhh!” Reflecting on experiences using technology during teaching practicum, Participant 5 discussed using Smartboard and Google Slides daily. Participant 5 revealed having students use Infographics on Piktochart, Kahoot, and Answer Garden. In addition, the participant encouraged the students to use their cell phones for example to basic research (looking up information using Google), use Jam Board, and use QR codes to link them to Google Forms questionnaires. Participant 10 discussed becoming comfortable using a wide range of educational technology tools introduced in the courses including Wix, Blue Button, Book Creator used in making websites, videos, podcasts and in other ways to support learning In commenting on successful uses of technology in the teacher preparation program, Participant 9 commented,

> I've been able to learn so much about different programs and different features and I've gained so much knowledge surrounding new technology….I had never coded before and I find myself successful in learning that. And I think just being able to have that new knowledge that I will be able to use in my teaching practice and able to share with students. I've learned so many new programs; I've got an entire list of it.

When asked, in what ways are you successfully using technology in the teacher preparation program? Participant 3 responded, "In every way because we have had to reckon with it, we didn't have a choice or an option to go that way."

Teacher self- efficacy beliefs leads to their level of confidence and competence in performing tasks (Lemon & Garvis, 2016). Nontraditional students also developed their self-efficacy concerning applying a wide range of technological tools to teaching. They were provided opportunities to practice using technology in their classes and in completing assignments; a majority of students interviewed shared examples of positive experiences about incorporating technological tools into teaching during their practicums. As student teachers, nontraditional students, especially the students who were near completion of the program, expressed being successful in immersing technology into their teaching to promote student learning, for example through creating interactive websites, cartoons, infographics, and podcasts. While on practicum the student teachers incorporated a wide variety of technology teaching tools such as Scratch, Kahoot, Jamboard, Answer Garden, Bubble.us, Blue Button, and Book Creator. Slusher (2018) asserted teachers' self-efficacy is the most significant factor driving their successful

performance of new initiatives. Nontraditional students explained how growth in their technology self-efficacy impacted them. For example, during practicum, being able to successfully implement tech tools that were only discussed but not used in the teacher preparation program, in addition to being motivated to explore and experiment with other new educational technology tools. Nontraditional students indicated their increased their confidence in using technology for both professional and personal purposes. Participant 7 highlighted the benefits of developed technology self-efficacy in saying:

> Before going into this program, if I had any technical issues, I'd tell my husband, okay, please solve this. Now I actually know that when I explore something, I will learn it, and it's definitely more sufficient than asking anyone to do it for me. So this is a mentality to have the confidence to make mistakes and go into something you are not familiar with. This is something that is established in this program.

In discussing successful uses of educational technology, Participant 1 declared, "I'm so much more comfortable with it now than I was a year ago this time!"

Theme 6: Factors Contributing to Successful Uses of Technology

This theme relates to the second research question. Nontraditional students attributed their successes in using educational technologies to personal factors including their growth mindset, prior technology foundation, and their life experiences. Also, professors in the teacher preparation program, including instructors for two technology focused courses provided technical support. In addition, nontraditional students received technical help from peers including younger, traditional students.

Personal Factors

A majority of students interviewed said in spite of challenges they encountered using technology, they believed their positive mindset, not giving up, being determined and persistent in pushing through until they ultimately understood what they needed to be able to know and do, was critical to their success. This growth mindset involves being committed to keep working on learning about technology until you get it right, being problem-solving oriented, and willingness to tackle technical problems with determination to find solutions. Participant 1 declared, “I’m not the one to back down. If I don’t understand something, I’m not one to throw my hands up and say, oh well, I can’t do it.” While, Participant 2 stated, “I am not scared of technology nor intimidated by it.” Brookfield (1995) suggested an autobiographic lens, one of four lenses of reflective practice, can help teachers to focus on their own experiences as teachers to reveal areas in their teaching that need improvement. Participant 2 described holding a belief that feeling scared about technical challenges at the beginning of the teacher preparation program can be helpful to teacher candidates in providing a lens for understanding their future students’ technical concerns; aiding teacher candidates in putting themselves in their students’ shoes. “When you don’t know about how you struggled, you won’t be able to understand how your students do it.”

Nontraditional students normalized feeling scared and frustrated when initially encountering technical challenges. For example, Participant 6 explained:

> For me it’s that resiliency, that perseverance, because sometimes I get frustrated, I walk away because I just can’t, I don’t have time, I just don’t care anymore, see

> I'm like, it's not making sense, everything I've tried is hours and hours... it was a circle that was never ending ... so at that point, I'm just spinning the wheels, I need to move on.

Andragogy highlights the importance of intrinsic motivation to the adult learner as well as the significance of connecting learning needs to social roles (Knowles, 1970). Participant 6 further explained how an understanding that technology is critical to student learning and teacher professional success drives motivation to persevere through challenges in order to understand how to effectively apply educational technology.

The learner's experience is another key aspect of andragogy. Adults acquire a reservoir of experience that can be a rich resource for learning (Knowles, 1970). Learners are not blank slates (Bruner, 1996); adult learners want to be able to use what they already know (Knowles et al., 2015). In addition to having a positive mindset regarding the use of technology, nontraditional students brought varying levels of technical experience into the learning environment, and suggested it was helpful to have a technology foundation, for example through previous jobs or schooling to build on when learning how to use new technology tools in educational contexts. Further, students suggested life experiences aided their growth and development in using and applying educational technology. Participant 3 stated, "When you grew up in a world where you didn't have anyone showing you how to do stuff; you just had to figure it out on your own."

Participant 7 revealed,

> I think at some point, like after the first week in the semester, I was really shy in the beginning to ask, and I said to myself, okay, I'm going to learn, like you know I'm older. And yeah, so I just started asking and asking didn't know how to share documents on the Google Drive I was really shy in the beginning (Participant 7).

Institutional and Instructor Factors

Nontraditional students explained how their courses, including a course about digital learning and another emphasizing digital context in education, aided them in building technical skills and confidence. Through these courses, students were immersed into the digital world and were prepared on what to expect as well as what they should be able to do regarding uses of technology in other courses in the program for example to complete assignments, in practicums, and future teaching to promote student learning. Participant 1 commented, "In our first term we took a digital literacy class which was good because that enabled us to get in and experiment with different tech tools." Participant 5 stated,

> We went over a bunch of tech tools and it was kind of like learning how to use them, and then we would be given a chance to go and try and implement them in our different assignments and stuff like that which I think is really good. So you can see for yourself and be like okay, I want to be able to learn to use that, because I can see all the advantages and figure out how to get myself from here to there."

Commenting on the digital context course, Participant 3 explained,

> We were fortunate because we had a course in a digital context, so that really prepared us for what to expect, what we needed to do for those courses, not only for ourselves, but also for our students. Several things that really stood out for me were how do you build a community in a digital world, right? How do you build trust? How do you build openness for critical thinking and help students to provide their opinions and thoughts in that environment? (Participant 3)

Regarding both courses, Participant 1 stated, "I feel like immersing in those courses that they offer, the digital literacy and digital context, I feel like those are the two tools that really helped me to get over that lack of knowledge and lack of comfort."

Nontraditional students indicated professors designed the learning tasks to promote self-directed learning so that students would be actively involved in their own learning with access to support as needed. As new tech tools were introduced in the classes, professors provided a action step overview of the tools, then allowed time in class for students to explore, make mistakes, practice and learn through trial and error. Participant 7, a first year student, explained that this approach helped with time management, allowing for reinforcement of learning right on the spot. Participant 2, who was near completion of the program pointed out that while students explored with technology on their own in the classes, support was readily available; "When you have a question or need help with something, they would help us, it's not like, oh, you go figure it out." In addition to the two technology-focused courses, technology is also integrated in courses throughout the program. Participant 5 stated,

> I am thrilled I chose this program, and thoroughly enjoyed how technology was introduced through a pedagogical perspective-from Garrison to T-Pack. The instructors were highly knowledgeable and promoted the use of tech (SAMR model) to engage and learn so that we can reproduce for our future classes (Participant 5).

Commenting on the level of technology integration into teaching at the institution, Participant 2 stated,

> I knew when I started this, specifically this program…. I knew that I'm going to be learning a lot. Yes, I have to say it exceeded my expectations. Oh there are so many things that I like. I'm waiting for the program to be over to try some things with my kids.

Professors provided extra support in a variety of ways. Nontraditional students deemed the following instructor efforts to be especially helpful:

- Frequent reminders by professor about being learners (concerning the uses of new educational technologies) alongside students. Participant 7 revealed, the professor often told students, 'I'm like you, I'll be learning too' he explained that he'd be learning about certain new technologies alongside with students, and encouraged students to 'just explore it."
- Professors sharing their expertise and tips in specific areas of technology with students for example providing tips on how to create clear Zoom videos or providing ideas on how to become Apple certified teachers. Participant 7 stated,

> We have two of our instructors who are really amazing with technology, so one of them for example showed us how to become an Apple certified teacher...it's something that you do online but you're more familiar with you know, Apple products, ipads blah blah blah; it's about technology and knowing what you have at your fingertips, so that definitely helped me

Another student, Participant 6, stated,

> Okay, you know, one of our professors was really wonderful; (the professor) invited us to do Apple teacher; (the professor) helped us log in and walked us through the process, and showed us what to do… so eventually I will get trained to be an Apple teacher.

Participant 7 stated,

> There was another professor who actually sent us two, three articles (the professor) wrote, for example, on using Zoom. Like it's just easier for someone like (the professor), like an expert, to just tell you do this and you get this better, like how to take (work with) your camera, lighting, angles, colors. I love that! I'm happy; it's like an unconventional style program.

Participant 9 stated,

> One of my professors, if (the professor) wants you to do something with a particular program, (the professor) records (themself) and screen share, navigating verbally telling you how to do, and what to do while she shares her screen, and she always publish those videos.

- Professors circulating through the online breakout rooms during classes to check in with every student to ensure they're okay with assignments, including the technology components of assignments. Participant 9 declared, "it's an opportunity to tell them I'm okay with this, or can you help me with this?" Participant 9 further stated,

  > Whenever we had an issue affecting the group you were compelled to address it, then to investigate it when we came back together as a whole class, you talk about the issue; they were able to troubleshoot. On a day when we're all having the same issues, they send an email saying, this is how to fix it - I love that! They've just been very helpful and it's funny because they're always quick as well.

- Some professors allocating 10-15 minutes of class time prior to an upcoming assignment for students to ask about technical aspects of the assignment. Whenever there's an assignment due date coming up, there's always 10-15 minutes of class time that we were able to use to ask about the technical aspects of the assignment. Also in Canvas, there is a chat box that you can use to ask questions as well.

Participant 9 revealed.

> Providing opportunities for students to communicate with others during the program such as through the chat box feature on Canvas and through an

Adobe Connect meeting room as a virtual space reserved for students to meet, practice, and collaborate with each other.

- Professors being patient in discussing new technologies and being readily available to listen to and address students' technical concerns. Participant 5 explained, "When they were introducing something, they were really going to be like okay, you know this is how to use this technology, and they would go through step by step, like a lot of things." Participant 9 recalled,

> I have never sent my instructor an email and didn't get back help. They say they are always available, but it is more than just to say– they really are, and they have never had to refer me to IT or anything.

Not all students asked for help when needed. Participant 6 revealed,

> I didn't ask for more time or support, I kind of suffered in silence with technology. I'm very sure if I reached out to the professors to say, that wasn't working, they would have happily supported me…I'm very sure that if I asked for help, I would have been given it.

Peer Support

Nontraditional students revealed peer support was instrumental to their success in using educational technology during the teacher preparation program. Participant 1, suggested students must be willing to admit when they don't know something and ask for help. Participant 1 shared, "If I haven't understood something, I've I'm okay and quite comfortable reaching out to say okay, I don't quite get this. Can you walk me through what you did?" Nontraditional students suggested it was crucial to build good

relationships with their colleagues including their younger tech savvy counterparts to aid in soliciting their classmates help with technical challenges. Participant 1 stated that nontraditional students can reciprocate assistance to younger colleagues by using strengths in non-technical areas. On a similar note, Participant 8 explained that while doing group work, peers help each other by sharing technology resources,

> for example, I've got a new laptop and we might be asked to complete an assignment that we need to build a website. Yeah, and a colleague who is in my group may not be able to run that much on their laptop, so I do it, yeah it makes us all successful.

The teacher preparation program promotes collaborative learning which students feel make it easier to make connections with classmates, build relationships and obtain peer support to help address technical challenges.

Summary

The study was carried out to provide insights about nontraditional students' challenges and successes using technology in a teacher preparation program. The findings of the study showed that the challenges nontraditional students encountered while using technology in the teacher preparation program involved difficulties with internet connectivity and videoconferencing platforms in online learning environments, struggles in learning to use educational technology tools mainly at the beginning of the program in addition to problems navigating course platforms. The findings of the study also revealed that nontraditional students were successful in using technology in various areas, especially as they progressed through their program. Nontraditional students' successes

using technology involved improvement in their online learning experiences such as finding it easier to carry out virtual meetings, to access information, and to collaborate with peers. Nontraditional students' successes also involved grasping the Google platform and being able to use and apply a plethora of educational technology tools in varying teaching and learning contexts. Based on the results it was evident students developed confidence in using educational technology as they progressed through the program.

Self- efficacy is an integral factor driving successful performance of new initiatives (Slusher, 2018). Preservice teachers' self-efficacy beliefs influence their level of competence to perform a task (Lemon & Garvis, 2016). Preservice teachers' high levels of technology integration self-efficacy positively correlated with technology education competency (Birisci & Kul, 2019). Developing teacher candidates' self-efficacy is critical to their successful uses of technology in teaching. Teacher educators can be instrumental in aiding teacher candidates in developing self-efficacy (Francom & Moon, 2018; Huang & Mayer, 2019). Nontraditional students attributed growth in their technology self-efficacy as they proceed through the program to personal factors such as having a growth mindset as well as to instructor, institutional and peer support.

The findings of the study are also connected to the conceptual framework andragogy. The principles of andragogy imply adults: (a) have accumulated experiences valuable to learning, (b) are intrinsically motivated to learn, (c) have learning needs that are connected to their social roles, (d) need to know why, what, and how they will learn, (e) have an autonomous and self-directing self- concept, and (f) are problem centered

(Knowles, et al., 2015). The first three of these assumptions as listed, were especially evident in the results of this study. Nontraditional students' prior technology experiences for example, technical skills gained through employment became useful to them in the teacher education program. The value of experience was also evident in opportunities for experiential learning in the teacher preparation program. Nontraditional students also felt valued to be able to use their technical experiences and expertise to help support colleagues. Participants in the study expressed being intrinsically motivated to learn about technology as technical knowledge and skills would support their personal and professional growth and development, especially to successfully perform the social role of being a teacher. Participants also applied what they learned about technology into their personal life, for example through exploring technology tools with their children.

As an outcome of the study, a white paper was developed to offer suggestions on how the institution might expand their service to further enhance nontraditional students' positive experiences using technology in the teacher education program. Particularly recommendations have been made for streamlining platforms and digital tools, providing additional technical training, providing extra time in-class for technology practice, and offering a student mentorship program to students who might need added support. The next section of this paper focuses on a project developed as a result of the findings of this study.

Section 3: The Project

This project was based on a study conducted to aid improved understanding of nontraditional students' perceptions and experiences using technology in a 2-year teacher preparation program. It appeared there was a lack of data about nontraditional students' successes and challenges using technology in the technology-rich teacher education program. Insights provided through this study should aid educators at the study site in continuous efforts to examine ways to improve teaching through student-centered practices. I developed this project, a white paper, to inform educators at X University, in a clear manner, about the methodology used to collect data, the six themes emerging from the study, and five corresponding recommendations for enhancing technical support to teacher candidates who are nontraditional students at the institution.

Rationale

From thematic analysis, six major themes emerged from the data: (a) challenges with online learning; (b) difficulties using educational technology tools, particularly at the beginning of the program; (c) barriers to technology user friendliness; (d) online learning successes; (e) successes in using educational technology tools; and (f) factors contributing to successful uses of technology. The results of this study might benefit administrators and educators at the study site by enhancing their understanding of nontraditional students' successes and challenges using technology in the program. I combined the findings from the study with support from the literature to generate five recommendations to help X University grow its support of nontraditional students and the broader society. The five recommendations made were:

1. Ensure LMS consistency between courses in the program.
2. Streamline the selection of digital tools and platforms.
3. Implement technical training for nontraditional students.
4. Allow extra time in class for students to practice using technology.
5. Offer technical support through student mentorship.

Suitability of White Paper to Address Problem and Research/Theory Criteria Used

I considered a white paper a suitable project for this study because it permits the clear sharing of insights into nontraditional students' experiences using educational technology along with recommendations in response to the evolving understanding of nontraditional students' technical needs. A white paper is used to argue for a particular solution to address a problem; it can help key decision makers and influencers justify the solutions they have proposed (Stelzner, 2007). In the white paper, I address the problem of a lack of understanding about nontraditional students' experiences using technology in the program by outlining the students' expressed views and experiences through the six major themes. Furthermore, based on the findings of the current study, the white paper was also used to propose recommendations to X University's administrators and educators, specifically to enhance streamlining of the LMS and digital tools as well as boost technical support services to nontraditional students through technology training, student-student mentorship, and allocation of time for in-class technology practice.

Considerations Rendering Other Project Study Genres Less Suitable

The other three basic genres of projects were less suitable for the current study based on the results of the data analyses. An evaluation report is reserved for evaluation

studies, so this genre of project was not applicable to the current study that was not an evaluation study. A curriculum plan was another option explored. Clausen et al. (2021) underlined the need for purposeful curriculum design, fieldwork, and assessment to prepare student teachers for program-deep and program-wide infusion of technology. In all courses, teacher educators should be able to effectively model the use of technology in their practice to help teacher candidates understand how to combine technology with suitable pedagogical practices in varying teaching and learning contexts (Polly et al., 2020). A problem often associated with integrating technology throughout curriculum is that some instructors are experts in specific fields but not necessarily specialists concerning technology integration (Graziano, 2018). A curriculum plan was not ideal because it appeared that suitable technology curriculum planning was already in place at the institution. Based on the study results, a wide variety of technology topics are covered through two technology standalone courses and technology is also well entrenched in the various courses throughout the teacher preparation program.

Although training is part of the recommendations arising from the data analysis, the training curriculum genre would not be adequate in capturing the variety of nontraditional student-expressed technical concerns. The goal of a white paper is to build a case to stimulate the reader to move toward a conclusion that the proposed product or services will best suit their needs (Stelzner, 2007). I used the white paper as a project deliverable for this study to present the experiences of nontraditional students concerning their use of educational technology at the institution and lay out literature-supported ideas for solutions that fit the institution’s mission.

Review of Literature

In carrying out the second literature review, I searched several databases through the Walden University Library to achieve saturation of literature, including Google Scholar SAGE, Ebscohost, ProQuest, and ERIC. I focused my search on peer-reviewed articles predominantly published within the past 5 years. To identify literature on the challenges and solutions presented in the white paper, a combination of the following terms were used: *nontraditional students*, *adult learning*, *educational technology*, *digital technology*, *technology challenges*, *self-efficacy*, *teacher education*, *training*, *peer-mentoring*, *teacher education program streamlining*, and *teacher candidates*. To review literature related to the suitability of the specific genre of the white paper, I also searched using these additional individual terms or a combination of the terms: *white paper in case studies*, *white paper in qualitative research*, *white paper*, and *position paper*.

Suitability of White Paper to Address Problem and Guide Project Development

A white paper, also referred to as a position paper, is often used to argue that a specific position or solution is an appropriate way for key decision makers or influencers to address a particular problem (Purdue University, 2018; Stelzner, 2007). The white paper is used to inform and advocate. A white paper should not be based on the opinion of the author, rather it should highlight the knowledge gap and offer evidence-based review of options resulting in an endorsed position (Bala et al., 2018). A white paper was appropriate for the current study in which I investigated nontraditional students' perceptions and experiences using technology in a teacher preparation program due to the findings of the study. The white paper related to the current study should aid

administrators and educators at X University gain a better understanding of how nontraditional students perceive technical successes and challenges and what the institution can do to address technical problems based on students' suggestions and evidence from the literature.

In writing a white paper, it is critical for the author to take the existing knowledge gaps of the audience into account while providing educational and credible information (Bala et al., 2018; Stelzner, 2007). To be persuasive, the author should focus on the needs of the audience for whom the paper is written (Purdue University, 2018.). In the paper, the author should quickly identify the issues affecting readers and direct them toward a solution; this customer-focused approach entails starting with the problem your recommendations solve instead of beginning with the solution itself (Stelzner, 2007). These considerations were paramount to me when writing the white paper for this project. I made considerable effort to provide administrators and faculty with pertinent information on nontraditional students' technical needs while employing a credible and unbiased tone.

I begin the position paper for this project by providing contextual information on the key research methodology features. Next, nontraditional students' successes and challenges using technology are summarized into six major themes, the key takeaways from the study are provided, and five evidence-based recommendations are proposed.

The Role of Research in Supporting Content of Project

It is critical teacher candidates are taught in ways that they can understand how to effectively apply technology in learning and teaching (Graziano, 2018) because different

generations of students often have varying attitudes, experiences, and learning preferences concerning the use of technology (Hursen, 2017). With teacher candidates from multiple generations mixed together in the same classroom, it is necessary for teacher educators to be cognizant of students' varying learning needs based on generational diversity. Teacher educators' understanding of nontraditional students' successes and challenges applying technology might aid them in providing equitable learning experiences (Safford & Stinton, 2016). Nontraditional students' experiences using technology may be associated with student, instructor, and institution factors.

Student Factors Affecting Students' Success Using Digital Technology in Education

Nontraditional students' unique circumstances, such as their technology self-efficacy and self-motivation, prior experience using educational technology, technical knowledge, and time management and organization skills, affect their successes or challenges using technology. Bandura (1977) defined self-efficacy as an individual's belief in their capacity to carry out behaviors necessary to produce specific performance accomplishments. Slusher (2018) suggested teachers' self-efficacy is the most important element driving their successful performance of new initiatives. Teacher self-efficacy beliefs lead to their level of confidence and competence in performing tasks (Lemon & Garvis, 2016). Sabaityte and Davidavicius (2017) commented that students vary in psychological characteristics based on the generation to which they belong. Having a conservative attitude towards technology creates a barrier to effective technology integration (Li et al., 2015). Stoltz (2019) found self-motivation is a major predictor of successful use of technology. Birisci and Kul (2019) reported that preservice teachers'

high levels of technology integration self-efficacy positively correlated with technology education competency.

Instructor and Institutional Factors Affecting Students' Use of Technology

Teacher candidates should be supported in ways that help them feel comfortable, confident, and positive about technology. While technology standalone courses provide exposure to various technology tools and software, these courses may not be adequate to promote teacher candidates' technology self-efficacy (Falloon, 2020). Teacher educators can apply a variety of strategies to aid teacher candidates in developing technology self-efficacy, including working to reduce students' anxiety and increase self-efficacy (Huang & Mayer, 2019). Teacher self-efficacy beliefs will influence the level of competence and confidence to carry out a task (Lemon & Garvis, 2016). Teacher educators can help promote teacher candidates' self-efficacy by providing opportunities for practical, authentic experiences involving the use of technology (Francom & Moon, 2018). Francom and Moon (2018) described a unique teacher preparation program involving a school-university partnership and a 1:1 technology device initiative to enhance teacher candidates' use of technology. The authors argued the partnership was an opportunity allowing teacher candidates to gain authentic experience using technology in an elementary school classroom that might not be replicated in a university course. Using an action research study, Song (2018) investigated preservice teachers' self- efficacy concerning technology integration through service learning. In this study, preservice teachers were required to provide service to a technology teacher in an elementary school by applying what they learned in a university course. Song reported service learning had

a positive effect on preservice teachers' self-efficacy on technology competence, their beliefs about integrating technology into future classrooms, and their understanding of the importance of educational technology.

Specific to the current study, participants' development of self-efficacy was evident; however, there is room for growth. The area in need of attention from administrators and faculty at X University involves improvement in course design for consistency and streamlining, providing technical support through peer mentoring, and offering additional technology training along with allowing extra time in regular classes for technology practice.

Support Through Course Design for Consistency and Streamlining

Course design affects faculty and students; when designing courses, it is essential to consider how the features of the LMS can be used to add value to all users (Santelli et al., 2020). In a teacher preparation program, it is also helpful to have consistency between the different courses in terms of the organization of information on the LMS. As students move through their program of study from one course to the next, a predictable LMS navigation experience helps save time (Lewis, 2021). Nontraditional students who participated in the current study suggested having a more consistent LMS navigation experience would be helpful. The teacher candidates also expressed interest in enhanced streamlining of the digital tools used in the program.

Technical Support Through Peer Mentoring

Mentoring, whether hierarchical mentoring, such as faculty member-student and advisor-student, or peer mentoring, otherwise referred to as student-student mentoring,

can be effective in promoting student success (Collier, 2017). Peer mentoring offers many benefits (Loman et al., 2020) to both the mentee and the mentor (Lefera & Swart, 2020). Student-student mentorship can be used to provide an opportunity for students to connect with someone who offers empathy, trust, core knowledge, and understanding of the learning institution as well as a shared viewpoint often deficient in other forms of mentoring (Krusemark & White, 2020). Collier (2017) suggested that with peer mentorship, mentees are likely to follow mentors' advice due to having a common perspective. Other advantages of peer mentoring include low cost and the availability of large numbers of potential mentors. Preservice teachers' peer mentorship can aid technology proficiency (Giles et al., 2020). Nontraditional students highlighted the importance of peer support to their success in using technology.

Additional Technology Training to Support Students and Extra Time for Practice

Stephen and Rockinson-Szapkiw (2021) reported that online students achieved improved self-regulation and self-direction using a first semester seminar course. An introductory technology course may help prepare students to make the most of programs in which technology is integrated. In the current study, participants indicated they could benefit from participating in additional technology training sessions if these were available to them. Nontraditional students also revealed they could benefit from having extended time during their classes to practice using new educational technology tools, especially the specific tools required for use in completing their assignments and coursework.

The Role of the Conceptual Framework in Supporting the Project

I applied andragogy, an adult teaching style proposed by Knowles (1970), as the conceptual framework for this study investigating nontraditional students' experiences using technology in a teacher education program at X University. Andragogy is based on six assumptions about adult learners:

- adults need to know why, what, and how they will learn;
- they have an autonomous and self-directing self-concept;
- adults have accumulated experiences valuable to learning;
- adults' learning needs are connected to their social roles;
- adults are problem-centered; and
- they are intrinsically motivated to learn (Knowles et al., 2015).

Three of the six assumptions of andragogy were deemed to be especially relevant to this study, specifically the importance of the learner's experience in adult learning, addressing the value of intrinsic motivation, and connecting adults' learning needs to their social roles. I found these three elements of andragogy to be intricately connected and strongly reflected in the results of the study as well as the corresponding recommendations that were made for improving technological services to nontraditional students at X University.

Role of the Learner's Experience

Adults have a reservoir of life experiences which should not be ignored, but rather be incorporated into their learning activities at learning institutions (Knowles, 1970). Adults attach greater meaning to learning acquired through experience than what is

learned passively (Knowles, 1970). Knowles (1970) ideas on the adult learner's experience underscores the need for educators to build on the learner's prior experiences and help learners learn from others within the learning community. Furthermore, to promote adult learning, there should be ample opportunities for experiential learning. Some participants in the study revealed that their use of technology in prior employment and education served as foundation for learning about educational technology. Students stated they felt valued for applying what they already known to support other at the institution in learning about technology. For example, participants discussed feeling valued when given opportunities to help others in learning to use technology at X University, example, in leading a technology-related training session and in helping classmates learn about technological teaching tools, applying technical experience acquired prior to entering the teacher education program. Participants also reflected upon benefits gained from in-class time for practicing to use new tech tools and incorporating technology into teaching while on practicum. Recommendations made in this study reflect the significance of utilizing adult learners' prior technology experience and also providing additional opportunities for students to gain experience using technology. One of the recommendations made involves the implementation of peer mentoring support program through which a student mentor could apply technical skills and experience in helping students requiring technical support. Another recommendation calls for providing additional in-class time for students to have increased hands-on experiences and practice using technology. Nontraditional students revealed that recognizing their previous

technology experience and allowing them adequate time to explore technology are among factors connected to their motivation to learn to use technology.

Importance of Intrinsic Motivation

Intrinsic motivation is important to adult learners, who often want to achieve personal growth and development (Knowles, 1970). A majority of the participants in this study expressed that they place high value on having a growth mindset and on attaining job satisfaction, and feel these factors are connected to their successful use of technology to promote their future students' learning. In addition to gaining personal satisfaction from using their past technical experience as a learning resource, nontraditional students stated reducing barriers to learning with technology are integral to enhancing motivation for improving their technical skills. To help mitigate technical challenges, recommendations arising from the study entail providing increased technical training for students and streamlining the learning management system to improve students' navigation experience.

Adult's Learning Needs Connected to Social Roles

Adult learners are interested in being able to immediately apply what they have learned (Knowles, 1970). The study participants, nontraditional students enrolled in a teacher preparation program, were aware that they would be required to infuse technology into their teaching when hired as teachers. While a plethora of new educational technological tools are being rapidly developed, participants expressed having interest in prioritizing their technology learning on the tech tools that would best help them to address their future students' learning needs and to perform classroom

responsibilities. A recommendation made in relation to students' expressed preference for a narrow focus on tech tools is for the teacher educators to further streamline the use of tech tools ensuring emphasis is placed on the technological tools best suited for the realistic situations of today's classrooms.

Project Description

The proposed recommendations for improving technical support to nontraditional students involve streamlining in different areas of the program, expansion on technology training, peer-mentoring, and allowing extra in-class time for students to practice using technological tools. Several resources are needed to aid implementation of these changes. Streamlining efforts require extra time for educators to collaborate and work in concert to offer students more predictable learning experiences. Educators at the university often work for extended hours; their demanding schedules must be considered when requiring their participation. Faculty discussions on streamlining could be carried out in small segments, gradually incorporated into staff meetings to reduce strain on the educators' schedule and workload. The institution will need facilitators for running both the technology training and peer-mentoring programs.

Existing supports at the university include access to faculty, staff and students who have extensive technology expertise. Staff and students at the university could carry out the technology training and peer-mentoring responsibilities. The university is well equipped with cutting-edge educational technology tools readily available for use by technology training facilitators and peer-monitors. Regarding the recommendation calling for students to be provided extra in-class time to allow students to be able to practice and

get support on the spot, educators may need to adjust the duration of the learning tasks in their lesson plans. There is a video-conferencing classroom already available where students in the program can meet for group work collaboration, additional spaces within the online environment could be created for nontraditional students to access technical support and practice using technology.

I intend to release the position paper to all stakeholders at the institution including administrators, faculty, and participants. The assistant dean at the faculty of education has expressed an interest in learning about the results of the study. Once approved, I will share the white paper with the assistant dean. I will seek permission from the gatekeeper at the site to present the white paper to all other stakeholders. Upon approval, I will share the findings during a staff meeting. I aim to present the white paper at a convenient time that would be least disruptive to the stakeholders. This could be toward the end of the spring semester when faculty might have a reduced workload for example while students are away from the campus carrying out their practicums. Having access to the white paper before the summer break could be helpful to administrators and staff who might want to begin planning for implementation of the recommendations before the start of the next academic year. Participants who expressed an interest in the study results will be sent a copy of the white paper by email by the end of the spring semester.

As a researcher, my main responsibility is to communicate in a clear and concise manner, the research methodology and findings to the administrators and faculty members at the study site. My role also involves highlighting the recommendations for improving technical support to nontraditional students. In carrying out my

responsibilities, I will share the white paper (Appendix A) with key stakeholders. Once my doctoral study is completed, I will email the assistant dean to arrange a convenient time to present an overview of the study. Next, I will seek the gatekeeper's permission to share the paper with key stakeholders. When approval is granted, I will present the white paper to administrators and faculty members ensuring their questions are addressed.

Project Evaluation Plan

Technology is an integral part of the teacher education program at X University where there is a high level of enrolment of nontraditional students. While technology is essential in supporting teaching and learning, often, nontraditional students lack sufficient technical skills (Tieman & Black, 2017). This project is based on a study carried out to permit better understanding of nontraditional students' successes and challenges using technology during a teacher preparation program. The overall goals of the white paper include:

- To communicate the results of the study and corresponding recommendations in a clear manner to the administrators and instructors of the teacher preparation program within 6 months of successful completion of the project.
- To encourage the administrators and instructors to implement the recommendations presented suggested in the white paper within one year after the presentation of the white paper to enhance technical support to nontraditional students.

A goal-based evaluation will be used for evaluating this project. A goal-based evaluation is an assessment that reflects whether a program is effective in achieving its

goals and the extent to which the program is having an effect on the target audience's behaviors (Centers for Disease Control and Prevention, n.d.). A goal-based evaluation is appropriate for this project since the white paper was purposefully designed to accomplish a set of goals; this form of evaluation could provide data on whether the intended goals of the project were achieved.

The overall evaluation goals involve:

- Determining whether the content of the white paper was clearly understood by the key stakeholders.
- To determine the likelihood of implementing the recommendations and gather administrators' and instructors' views on factors affecting implementation.

For this project, the key stakeholders at the institution are deemed to be the dean, the assistant dean, instructors of all courses within the primary/junior and intermediate senior divisions as well as instructors of the two technology standalone courses at the Faculty of Education. Two evaluations involving these stakeholders will be conducted; the first will be carried out at the end of the white paper presentation, and the second will be conducted one year after the presentation (Appendix B). Yarborough et al., (2011) discussed four main attributes of a fair evaluation: utility, propriety, accuracy, and feasibility. The utility standards require that products and processes of an evaluation are valuable in meeting the needs of the stakeholders. Propriety standards entail following the ethical and legal standards governing an evaluation. Accuracy standards pertains to the truthfulness and dependability of an evaluation while feasibility standards call for

enhancement of evaluation effectiveness and efficiency (Yarborough, et al., 2011). These evaluation features will be followed in carrying out the evaluations for this project.

Project Implications

Nontraditional students experience both successes and challenges using technology while immersed into a technology-rich teacher education program at the local site. Teacher candidates, when serving as teachers, will be required to infuse technology into teaching practices to support student learning. This project was based on a study that investigated nontraditional students' perceptions and experiences using technology in the teacher preparation program at the site. Enhanced technology education can benefit educators, students, the community, and larger society.

A more thorough understanding of nontraditional students' experiences concerning the use of technology may lead to the delivery of improved learner-centered programs and services to nontraditional students (Nolan & Swart, 2015). Teacher educators at the local site can improve their professional practice by using insights about nontraditional students' technical needs to tailor support to the learners' needs. The concept of student-centered learning is not new to the university; it is part of the university's mission and embedded into teaching practices. The white paper offers ideas on what the institution can do to positively impact the nontraditional student experience.

Applying the proposed white paper recommendations could promote learner-centered teaching. Efforts to improve technology-related streamlining among courses, expanding technology training, offering peer-mentoring services, and more in-class time for practicing to use technology are ways to help nontraditional students save time, a

scarce resource for this population, and improve their learning experiences. Peer-mentorship could provide an opportunity for shared benefits (Krusemark & White, 2020) while the mentee learns from the mentor, for example the strategies the mentor used in overcoming technical challenges, the mentor might strengthen confidence in technical skills during the transfer of learning.

The white paper recommendations might help nontraditional students to feel more confident about using technology. Technology self-efficacy has been associated with teacher candidates' attitudes digital technology (Gudek, 2019). Teacher candidates when later hired as teachers might be more confident in incorporating technology into teaching to support students' learning. Technology used alongside with good teaching practices can promote students' development of 21st century skills including communication and collaboration, creativity and critical thinking (Shafie et al., 2019). Today, it is vital that students develop sufficient technical skills to operate successfully in technology-rich learning and working environments. Improving on the use of educational technology has the potential to impact the broader needs of the society.

Conclusion

Section 3 began with an overview of the study driving the development of the project and a description of the project, a white paper (Appendix A). From there, drawing on research evidence from literature and the findings of the current study, a rationale was provided to justify suitability of a white paper to address the local needs. Next, a scholarly review of literature was presented including a description of themes relevant to the findings of the study, specifically the results of the study revealed nontraditional

students' successes and challenges using technology were connected to student, instructor, and institutional factors. The literature review was also used to explain how the white paper and its recommendations were developed. I will present the white paper to the key stakeholders of the local site and carry out two evaluations (Appendix B). A survey will be administered at the end of the presentation and a goal-based evaluation will be conducted one year after the presentation. Finally, this section contained discussions on how improving teacher candidates' experience using educational technology has the potential to impact learners, instructors, the community, and the larger society. In the next section, reflections on the project and the researcher's experiences regarding this work the will be offered.

Section 4: Reflections and Conclusions

In this final section, I discuss the project strengths and limitations and offer alternative approaches for addressing the problem of a lack of understanding regarding nontraditional students' experiences using educational technology in a teacher preparation program. Then, I reflect on the growth in my learning associated with conducting the study and discuss my aspirations for improving my professional practice and community service. Reflections on the importance of the work will also be offered along with a discussion of the project implications, applications, and directions for future research.

Project Strengths and Limitations

I selected a white paper as the genre for this project. Often, a white paper is used to argue that a particular position is suitable for solving a problem (Purdue University, 2018). The white paper for this study included contextual information on key research features of the study, a description of the major themes arising from data analyses, key takeaways on lessons learned, and proposed recommendations for expanding technical support services to nontraditional students. The white paper genre has both strengths and shortcomings.

White Paper Strengths

One of the strengths of the white paper is that it can aid administrators and faculty members at the X University in gaining a better understanding of nontraditional students' successes and challenges using technology in the teacher education program. The major themes presented in the white paper can serve as a basis for reinforcing or expanding

knowledge on what forms of technical support practices are effective and where there are opportunities for improvement. Similarly, the key takeaways reflect a summary of the main successes and challenges students encountered that should be informative to X University educators.

Another strength of the white paper pertains to the availability of proposed recommendations for enhancing technical support services to nontraditional students. The recommendations I made reflected the voices of nontraditional students who participated in the study alongside of evidence from the literature. Administrators and faculty members can implement the recommendations to improve nontraditional students' learning experiences as well as support community and societal needs.

The white paper can also be used in facilitating professional development among X University faculty. For example, one of the recommendations contained in the white paper pertains to refining the streamlining of services to students, which is an opportunity for faculty to collaborate and work in concert to identify priorities for developing more uniform ways of serving nontraditional students.

White Paper Limitations

There are drawbacks to the white paper. To implement some of the recommendations made in the white paper, extra demands would be placed on the institution, especially concerning financial and time requirements. For instance, providing additional technology training and peer mentoring may require financial investment. The recommendation for allowing extra time in class for students to practice using technology could be problematic in light of the busy schedules of administrators and faculty

members. In the white paper, I provide recommendations that are general in nature and do not provide specific suggestions on programming to guide on how to accomplish the proposed changes. These are examples of factors that might lead to resistance in implementing the proposed changes. It should also be noted that the information contained in the white paper is specific to the X University and not generalizable. Moreover, different cohorts of nontraditional students at the same institution may have different technical needs.

Recommendations for Alternative Approaches

I developed a white paper containing recommendations for enhancing technical support to nontraditional students based on the findings of a qualitative study involving interviews with 10 nontraditional students enrolled in a teacher preparation program. An alternative approach to addressing the local problem would be to carry out a mixed-method study including a quantitative component in the form of a survey with a larger group of nontraditional students to identify the extent of their technical challenges, such as difficulties with online learning, including internet connectivity issues, challenges forming groups within the online learning environment, and problems with videoconferencing. Problems associated with technology tools and technology user unfriendliness experiences could also be included as items in the survey. Furthermore, the study could be conducted annually to track changes over time. Qualitative interviews could then be conducted to gather in-depth information about the main issues arising from the quantitative surveys.

Furthermore, as an alternative to developing a white paper, I could have created a professional development program (e.g., a 3-day workshop for administrators, faculty members, and technical staff at X University). The training objectives could be based on the proposed white paper recommendations. The workshop would provide an opportunity for stakeholders to share ideas and collaborate on the suggested ways of improving services to nontraditional students over a 3-day period instead of several meetings over a longer period of time. In the workshop, tips and strategies could be shared concerning ways of implementing the recommendations.

Growth as a Scholar

Doctoral students have many opportunities to develop scholarship while carrying out doctoral studies. I have achieved considerable growth as a scholar while conducting this study and developing the project. During these processes, I was immersed into a variety of scholarly activities, including having critical discussions with peers on research-related topics, adhering to rigorous research ethical standards, reading scholarly literature, and using a scholarly tone in writing. Interacting with peers verbally and through online discussions helped in gaining alternative perspectives on different areas of research while subjecting my views to scrutiny. There was also opportunity for me to critically examine and interrogate the ideas of others. The feedback of my committee members and the research ethics reviewers presented opportunities for me to detect my mistakes, think deeper, reflect, refine my work, and learn. I have further expanded my understanding of scholarship through reading scholarly articles and writing in a scholarly tone. As a result of growth in my learning as a scholar since conducting the study, I am a

more critical thinker, better prepared to persevere the rigor and intricacies of searching for truth through research, and a more open-minded person overall.

Growth as a Practitioner

Brookfield (2002) suggested using an autobiographical lens can aid in becoming a critically reflective teacher. My journey through the doctoral study process has shaped my teaching in many ways. Through this program I gained firsthand experience with qualitative research, allowing me to apply the lens of a researcher in relevant social contexts, including when interacting with students, administrators, and colleagues. For example, I display heightened awareness concerning confidentiality, validity, and credibility. In performing the roles of a student and a teacher simultaneously, I applied what I learned through the doctoral program to improve my professional practice. I was also able to view my teaching through the lens of being a student and easily identified with the challenges associated with managing the demands of coursework. As a student, receiving positive reinforcement and support from instructors not only enhanced my motivation but reminded me to be a more empathetic teacher. Becoming a student made me a better teacher. Furthermore, I envision my experiences with student-centered and problem-based learning in the program will have ongoing impact on my professional practice.

Growth as a Project Developer

This project was based on the first major qualitative research study I have conducted. The idea of carrying out a qualitative study initially appeared to be a daunting experience. I had previously only conducted quantitative studies, so carrying out

qualitative research by having conversations with people was a new experience. Due to the nature of my research question, a qualitative study was required. The uncertainties and fears I experienced about participant recruitment, qualitative data collection, and data analysis gradually faded as I explored literature and proposed a plan for conducting the study. I enjoyed having positive interactions with stakeholders at the study site including all study participants. Based on findings derived from the participant's responses, a white paper was developed as the project. Producing the white paper, by itself, was an enormous learning opportunity. For example, I learned how to write a white paper and also learned the importance of prioritizing the needs of the stakeholders. In writing the white paper as the project for this study, it was necessary to focus on nontraditional students' technical needs as well as the needs of the administrators and faculty at the institution. I am now motivated to lead other projects and help others learn about project development.

Reflection on Importance of the Work

I am grateful for the challenges and opportunities involved in carrying out this work. Through this process, I expanded my knowledge and skills in research and project development as well as gained a sense of personal satisfaction and fulfilment from serving others. Educators and nontraditional students at X University might find the information and recommendations provided in the white paper helpful. The findings of the study as revealed through the six themes discussed in the white paper should help educators in better understanding the technical successes and challenges nontraditional students encounter in the teacher education program. Insights gleaned from the study

might reinforce or highlight practices that are working well and areas where there is opportunity for development.

The proposed recommendations entailed enhancing technology-related streamlining between courses, providing additional technology training and peer mentorship, and allowing extra time for in-class technology practice. If implemented, these recommendations could help educators improve service to nontraditional students and lead to more positive learning experiences for these students. The study holds implications for creating social change, and I am passionate about making a difference in the lives of others.

In this study, I focused on nontraditional students' perceptions and experiences using technology while taking part in a 2-year teacher preparation program at X University. More specifically, data were collected on the successes and challenges nontraditional students encountered while using educational technology at the institution. Based on the data generated, it was clear that nontraditional students were already reaping the benefits of an effective technology integration program. The findings of the study, along with evidence from the literature, revealed that there is an opportunity for educators at X University to apply new measures to grow and refine the technical services provided to nontraditional students. Therefore, I made recommendations to administrators and faculty at the institution regarding areas that could be addressed to improve the services for nontraditional students. Improvement in technical support to nontraditional students could lead to better learning experiences for the students.

I used andragogy as the conceptual framework guiding this study. Andragogy is based on six assumptions about adult learning, and three of these six principles were evident in this study. The first assumption addresses the value of experience to the adult learner. Adults accumulate a reservoir of experiences that should be considered when delivering their learning experiences (Knowles, 1970). Nontraditional students who participated in the study showed they valued incorporating their technical skills acquired through prior life experiences, such as employment, into their coursework and also using technical skills to support colleagues in their learning. The value of experience also came through as students were given opportunities to explore and practice using educational technology tools.

Concerning the second assumption of andragogy, Knowles (1970) emphasized the importance of intrinsic motivation to adult learners who often strive to achieve personal growth and development. Participants in the study demonstrated they had used intrinsic motivation to propel them overcoming technology-related obstacles and succeed in learning to use technology in order to grow and develop personally and professionally.

The third assumption implies adults are interested in being able to apply their learning to their social roles (Knowles, 1970). Nontraditional students acknowledged the importance of technology to learning and emphasized their determination to effectively apply technology to their social roles in teaching, particularly to improve their future students' learning.

While the study holds promise for creating positive social change, it should be noted that the results are relevant only to X University and cannot be generalized due to

the small sample size of 10 participants. I recommend that future researchers increase the number of participants and include instructors' perspectives on the delivery of the technology-infused courses and support to students. Further studies could also include a quantitative component, such as surveying many students, to identify the extent of nontraditional students' technical challenges, such as difficulties with online learning, technology tools, and occurrences of technology user unfriendliness. Future researchers could also focus on comparing first- and second-year students in terms of their technology self-efficacy. Another direction could entail looking at nontraditional students' uses of technology in their teaching after graduating and being hired as teachers.

Conclusion

Teachers are expected to effectively integrate technology alongside pedagogical practices to promote student learning. To support this requirement, often, educators involved with teacher training are interested in looking at ways to enrich their technology education offerings to teacher candidates to better equip them in performing their role as new teachers (McKnight et al., 2016). Nontraditional students, a distinct and growing population of students who do not follow a traditional route entering teacher education programs, may have different technology learning needs than traditional students (Henson, 2014). In this study, I explored nontraditional students' perspectives and experiences using technology in a teacher preparation program and pinpointed key measures that could be applied to growing technology support to nontraditional students at X University.

In addition to improving nontraditional students' learning experiences, applying the recommendations generated from the results of the study has the potential to enhance the university's ability to serve the broader community and societal needs. Teacher candidates' technical self-efficacy influences their use of technology in the classroom (Francom & Moon, 2018). Technology can be used to promote vital skills, such as creativity, communication, and critical thinking, to help students perform effectively in the society (Shafie et al., 2019).

I have also achieved personal benefits from developing this study. I had positive experiences conducting qualitative research, including my experience interviewing study participants, analyzing data, and developing a white paper. I look forward to continued growth as a scholar, practitioner, and project developer and, particularly, having the chance to apply my knowledge and skills in improving the lives of others as they help and promote social change to make the world a better place.

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Appendix A: Project Study White Paper

Nontraditional Students' Perceptions and Experiences Using Technology in a Teacher Preparation Program

Amy Wright

White Paper

Walden University

June 13, 2021

Introduction

A white paper is often used to advocate that a particular position is the best direction to follow or that a certain solution is most suited for a specific problem (Purdue University, n.d.). This paper is based on a study conducted to aid better understanding of nontraditional students' perceptions and experiences using technology in a 2-year teacher preparation program. This study was conducted as part of my doctoral study requirements towards the completion of the Doctor of Education degree. The paper provides information on key research components and description of six major themes arising from the study. In addition, the paper includes five proposed recommendations to the institutions' faculty of education administrators and professors concerning ways of enhancing technical support to nontraditional students enrolled in the teacher preparation program.

The Research Questions

Two main research questions guided this study. The first question was posed to provide insights into nontraditional students' experiences concerning their challenges in understanding and applying technology in a two-year teacher preparation program at your University. The first question was also asked to gather the perceptions of nontraditional students concerning factors they believe contribute to challenges in their uses of technology. The second question was asked to provide insights into nontraditional students' experiences concerning their successes in understanding and applying technology in the teacher preparation program. Further, the second question was posed to

get the perceptions of nontraditional students concerning factors they believe contribute to their successful uses of technology. The research questions were:

RQ1: What are the perceptions and experiences of nontraditional students about challenges of understanding technology and applying technology into their coursework in a teacher education program?

RQ2: What are the perceptions and experiences of nontraditional students about successes in understanding technology and applying technology into their coursework in a teacher education program?

Both research questions were designed to be addressed through interviews with nontraditional students in the teacher education program.

The Participants

The participants in the study were nontraditional students enrolled in a teacher preparation program at a local university. Nontraditional students are students over 25 years old returning to learning after being away from the classroom for several years (Caffarella & Daffron, 2013). Participants were selected for involvement in the study based on the following criteria: (a) be approximately 25 years or older and have been away from post-secondary studies for several years upon enrollment in the teacher education program, (b) possess and be able to share key information essential to the study, and (c) offer diversity to the study in terms of race, gender, cultural background, or division of study within the teacher education program. Ten nontraditional students enrolled in the two-year teacher education program at the local university participated in the study.

The Research Design

The study utilized a qualitative research approach; specifically, a basic qualitative design was used to aid in-depth understanding of participants' experiences (Creswell, 2012). A qualitative approach was an effective method for this research due to nature of the research questions and the research problem. The goal of the proposed research was to gain an in-depth understanding of nontraditional teacher candidates' experiences using technology in their courses. A qualitative case study permits deep exploration of an event within its real-life context (Creswell, 2012). The case study design permits exploration of a phenomenon within its context with the use of various data sources to allow different areas of the phenomenon to be revealed and understood (Baxter & Jack, 2008). A case study is a suitable design for examining an issue when a comprehensive understanding of the situation is needed.

The Data Collection and Analysis

Data collection was done through one-on-one semi-structured interviews with open ended questions to elicit detailed responses. Expanded responses were sought from participants through probing questions. At the end of each interview, the audio-recorded data were transcribed with the assistance of NVivo data transcription service. Data analysis was done through coding of each transcript followed by thematic analysis. Strategies applied to ensure data credibility included member checking and researcher reflexivity.

The Results

Six main themes were derived from participants' interviews. Three themes were connected to the challenges encountered while using technology: Theme 1, challenges with online learning; Theme 2, difficulties using educational technology tools mainly at the beginning of the program, and Theme 3, barriers to technology user friendliness. The remaining three themes were associated with nontraditional students' successes using technology: Theme 4, successes with online learning; Theme 5, successes using and applying technology in a variety of teaching and learning contexts and development of technical self-efficacy, and Theme 6, factors contributing to successful uses of technology.

Theme 1 pertained to the first research question: "What are the perceptions and experiences of nontraditional students about challenges of understanding technology and applying technology into their coursework in a teacher education program?"

Nontraditional students revealed they encountered challenges with online learning, specifically, difficulties using videoconferencing platforms and internet connectivity issues. Students had difficulties with navigating videoconferencing platforms for leaning purposes and encountered disruptions during synchronous online classes, especially when using Adobe Connect. Internet connectivity issues were prevalent particularly for students who accessed classes from rural areas having limited internet availability or adverse weather conditions leading to network instability.

Theme 2 also addressed the research question, "What are the perceptions and experiences of nontraditional students about challenges of understanding technology and applying technology into their coursework in a teacher education program?"

Teacher candidates enrolled in the teacher preparation program are required to use a plethora of technological applications and tools to support teaching and learning including Google Suite tools, Wix, Scratch, Kahoot, Jamboard, Pear Deck, Answer Garden, Piktochart, Audacity, Bubble.us, Padlet, and Lindt. Nontraditional students, especially students who felt out of touch with technology upon entering the program, reported they felt overwhelmed by the wide variety of technology tools and struggled with learning how to use the tools especially during the first few months of the program.

Theme 3 is the final theme that related to the research question, "What are the perceptions and experiences of nontraditional students about challenges of understanding technology and applying technology into their coursework in a teacher education program?"

The theme revealed that nontraditional students experienced user inconveniences in a variety of areas when using technology particularly at the beginning of the teacher preparation program. Challenges arose when navigating the program learning platform, using certain types of computer hardware or browsers, in addition to login and printing issues. In some instances, students ran into difficulties in trying to access the location of key course information on the learning platform. Concerning the hardware challenges, some students needed to replace the laptops they original brought into the program with newer devices with robust capabilities for handling the software applications and

programs requirements for completing coursework. Furthermore, there were instances of incompatibility between students' browsers and certain websites or software programs used in the courses.

Theme 4 focused on the second research question, "What are the perceptions and experiences of nontraditional students about successes in understanding technology and applying technology into their coursework in a teacher education program?"

Nontraditional students revealed they gradually became more comfortable with online learning as their program progressed. Students became familiar with the features of the online learning platforms and were able to access information faster and easier in virtual classes over time. At the university, technology is used in ways that provided opportunities for students to be collaborative. Participant 3 remarked, "Although I was not usually a proponent of collaborative work, I now look forward to collaborative projects". Working collaboratively online, nontraditional students shared ideas and felt they achieved deeper, richer learning experiences. As nontraditional students progressed through the program, they indicated they felt comfortable conducting virtual meetings including teaching online. Participant 3, stated, "I'm not afraid of teaching online…, during practicum, when teaching online, I was able to create fun activities and got students engaged into discussions and asking questions even when they were not on camera".

Theme 5 is connected to the research question, "What are the perceptions and experiences of nontraditional students about successes in understanding technology and applying technology into their coursework in a teacher education program?"

Nontraditional students described growth in their learning concerning the use of educational technologies as they advanced through the program. Participant 6 explained, “I (now) have a good grasp of Google Drive, I understand what it is supposed to do and how it stores information though there’s still more to learn about its features.” While Participant 1 commented, “I have gotten adept with the entire Google platform, Google Meet, Google Classroom, Google Sites….”.

Teacher candidates’ self- efficacy beliefs correlates with their level of confidence and competence in performing tasks (Birisci & Kul,2019). Nontraditional students also developed their technology self-efficacy and successfully applied a plethora of technological tools during their practicums. Participant 7 highlighted the benefits of developed technology self-efficacy in saying: “Before going into this program, if I had any technical issues, I’d tell my husband, okay, please solve this. Now I actually know that when I explore something, I will learn it, and it’s definitely more sufficient than asking anyone to do it for me. So this is a mentality to have the confidence to make mistakes and go into something you are not familiar with. This is something that is established in this program.”

Theme 6 focused on the research question, “What are the perceptions and experiences of nontraditional students about successes in understanding technology and applying technology into their coursework in a teacher education program?”

Nontraditional students attributed their successes in using educational technologies to personal factors including their growth mindset, prior technology foundation, and their life experiences. Also, professors in the teacher preparation

program, including instructors for two technology focused courses provided extensive technical support. In addition, nontraditional students received technical help from peers including younger, traditional students.

Summary of Findings

Participants shared may stories about their experiences with infusion of technology into different courses of the program. It was clear nontraditional students recognize the importance of technology to teaching and learning. Overall, participants expressed a high degree of satisfaction with opportunities to not only to learn how to use technology but also how technology combines with pedagogical strategies modelled by faculty in the teacher preparation program.

Key Takeaways

1. Nontraditional students in the teacher preparation program have high levels of interest and passion concerning learning to apply technology to aid their future professional practice, in particular to use technology to create more student- centered learning opportunities in their future classrooms.
2. The teacher candidates encountered technical challenges in the program mostly during the first semester of the first year of the 2-year teacher preparation program.
3. Over time, as the students progressed through the courses in the program, they developed confidence in using technology and have largely attributed their success to personal factors, institutional and instructor factors, as well as peer support.
4. Nontraditional students hold the institution in high regard concerning its technology integration efforts and existing supports to students. There is also opportunity for the

institution to further develop measures of providing technical support to enhance nontraditional students' learning experiences.

Proposed Recommendations

Nontraditional students suggested that the institution and instructors could further help them through streamlining to ensure more consistency with the online platform from one course to the next and make it easier for them to use technology. Participants also proposed that additional support with technology itself, especially the technological tools required to be used in completing assignments would be beneficial to their learning. Based on the participants' expressed needs for streamlining and additional technical support and literature evidence, I have developed several recommendations. Nontraditional students' perceptions offered in this study will provide administrators and instructors at the institution with measures that will lead to improvement in nontraditional students' experiences using technology for learning at the institution.

The five recommendations below are areas that can be leaned to enhance nontraditional students' experiences using technology in the 2-year teacher preparation program.

1. **Consistency Between Courses in Organizing Information on the Learning Management System (LMS)**

A consistent and predictable LMS navigation experience as students move from one course to the next can help students to save time searching for information (Lewis, 2020). Participants expressed a need to have their course information displayed at an established central point on the learning management platform across all courses, instead

of at different locations depending on the course, to allow for the same navigation experience moving from one course to the other. For example, all courses placing the link for joining a class in the announcement section of the homepage, instead of sometimes the link being in a syllabus. Both students and faculty are impacted by course design. When designing courses, it is essential to consider how the features of the LMS can be used to add value to the faculty and student experience (Stantelli et al., 2020).

2. Selection of Digital Tools and Platform

With a wide range of digital tools available for use in education, nontraditional students suggested the necessity to determine which tools are most beneficial to them, and throughout the different courses, focus their learning in an in-depth manner on that particular set of tools that would add the most value to their education. However, students also revealed that for assignment purposes, they would benefit from having more options in selecting the digital tech tools that are most convenient to them. Some participants pointed out that students enter the programs with different types of computers, and different software programs and tools react differently based on the type of equipment being used. So, to ensure compatibility, having flexibility in selecting the technical tools used for assignments is critical. Nontraditional students have also suggested that it would be helpful to implement further streamlining by using the same video conferencing platform in all courses, recognizing that some professors have already switched to a more suitable platform than a problematic type that was previously predominantly used.

3. Implementing Technical Training

Participants expressed interest in having mini-information sessions outside of regularly scheduled classes, especially during the first semester of the first year of the program to provide added support on using the tech tools that students will be required to use in completing their assignments, for example having a small training session on how to create a video. There is opportunity for implementing technology training sessions which could be accessed on a voluntary basis based on students' interest and unique technical needs. Stephen and Rockinson-Szapkiw (2021) reported that online students achieved improved self-regulation and self-direction through the use of a first semester seminar course. An introductory technology course may help prepare students to make the most of programs in which technology is integrated.

4. Extra Time In-Class for Focus on Technology

Nontraditional students have acknowledged the benefits they have derived from having time to explore with technology in the two technology-infused courses as well as being allocated extra time in some of the other classes prior to upcoming assignment due dates to ask questions or work on the technology component of the assignments. Participants indicated it would also be helpful to extend the in-class time allocated for practice and clarification regarding the use of technology ahead of submitting assignments. If students did not understand how to use technology tools introduced during class, they struggle when they needed to use the tools in assignments on their own. Providing extra time for exploring tech tools could create additional opportunities for

students to get support from peers and instructors especially focusing on the technology components of assignments.

5. Student Leaders Mentorship

One of the most prevalent themes in this study highlighted peer-to-peer support as a critical factor for achieving success in learning to use educational technology. It was also clear in other themes that some nontraditional students succeeded in using technology in areas where others struggled. For example, students in the second year approaching program completion revealed they achieved high levels of technology self-efficacy, while technical challenges appeared to be more prevalent with the first year students.

Pre-service teachers' peer mentorship can aid technology proficiency (Giles et al., 2020). There is an opportunity for developing mentorship involving student leaders, for instance, students who are near completion or have recently completed the program could play an active role in providing individualized technology support to new students. Peer mentorship can be used to provide students with someone who is approachable, trustworthy and knowledgeable with an understanding of the institution, and a shared viewpoint often deficient in traditional forms of advising (Krusemark & White, 2020). Peer mentorship can be useful in reducing anxiety and stress, and in enhancing participation, engagement, and performance in the learning community (Krusemark & White, 2020). Providing support to pre-service teachers through peer mentorship can improve mentees' technology proficiency (Giles et al., 2020).

Conclusion

The white paper serves to inform educators at the institution's faculty of education about the results of the study and proposed recommendations based on nontraditional students' perceptions and experiences using technology in the teacher preparation program and literature evidence. The thematic analyses revealed students experienced challenges with various areas of online learning as well as difficulties using technological tools. As students progressed through the program, they eventually overcame many of the initial barriers to learning with technology and developed technology self-efficacy. Opportunities for improving nontraditional students' experiences using technology for learning exist in the areas of program streamlining and developing additional technical support measures to improve nontraditional students' learning experiences. The proposed recommendations should aid educators in reinforcing support to students to enhance students' digital competencies and the quality of their learning experiences.

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Appendix B: Program Evaluation Plan Description and Form

This project will be evaluated using goal-based evaluation to evaluating this reflect whether the project was effective in achieving its goals.

The overall evaluation goals involve determining:

- whether the content of the white paper was clearly understood by the key stakeholders,
- the likelihood of implementing the recommendations and gathering administrators' and instructors' views about the factors influencing implementation.

The key stakeholders at the institution who will be asked to complete the evaluation are the dean, assistant dean, all educators within the primary/junior and intermediate/ senior divisions as well as instructors of the two technology standalone courses at the Faculty of Education. Two evaluations will be carried out; the first evaluation will be done at the end of the white paper presentation while the second evaluation will be carried out one year after the presentation.

Project Evaluation Form

Part 1:

To be completed after review of the white paper.

Instructions: Please select scaled responses to the questions below and provide a brief explanation for your selections.

Read the item below and circle the number that represents how you feel.

1=Strongly Disagree; 2=Disagree; 3=Slightly Disagree; 4=Slightly Agree; 5=Agree; 6=Strongly Agree

Question 1: Can you please indicate your level of agreement that the recommendations stated in the white paper were clearly communicated?

(1) Strongly Disagree (2) Disagree (3) Neither Agree/Disagree (4) Somewhat Agree (5) Strongly Agree

Comments

_____
_____
_____

Question 2: Using a scale from 1 to 5, where 1 is not likely and 5 is very likely, can you please indicate how likely you think it is that the institution will implement each recommendation indicated in the white paper?

1- Very unlikely 1- 2- 3- 4- 5-Very Likely

(a) Consistency Between Courses on the LMS
(1) (2) (3) (4) (5)

Comments

_____
_____
_____

(b) Selection of specific digital tools to be used in program
(1) (2) (3) (4) (5)

Comments

_____
_____
_____

(c) Selection of specific platform
(1) (2)(3) (4) (5)
Comments

_____
_____
_____

(d) Technology training program
(1) (2) (3) (4) (5)

Comments

_____
_____
_____

(e) Extra time in-class for focus on technology
(1) (2) (3) (4) (5)

Comments

_____
_____
_____

(f) Student leader mentorship program
(1) (2) (3) (4) (5)
Comments

_____
_____
_____

Part 2: Project Evaluation Form

One year following delivery of the white paper.
Instructions: Can you please check the relevant item to indicate the recommendations implemented from the white paper and comments concerning implementation?

(a) Consistency Between Courses on the LMS

Completed **Not Completed**

Comments

_____
_____
_____
_____

(b) Selection of specific digital tools to be used in program

Completed **Not Completed**

Comments

_____
_____
_____
_____

(c) Selection of specific platform

Completed **Not Completed**

Comments

_____
_____
_____
_____

(d) Technology training program

Completed **Not Completed**

Comments

_____
_____
_____
_____

(e) Extra time in-class for Practice

Completed Not Completed

Comments

_____
_____
_____
_____

(f) Student leader mentorship program

Completed Not Completed

Comments

_____
_____
_____
_____

Appendix C: Interview Protocol and Questions

Introduction

Thank you for participating in this interview today. I am a doctoral student at Walden University conducting a study about nontraditional students' experiences using technology in courses at X University. Your input is very important and I appreciate your time. The results of the study will be used to make recommendations for services to support the technical needs of nontraditional students at X University. I will give you some information about the interview.

The duration of the interview is expected to be about 30 minutes, and will be audio-recorded. I will ask open-ended questions to provide an opportunity for you to provide as much detail as you like. Upon asking each question, I will wait until you are ready to start providing an answer. Feel free to take the time you need to think about each question before answering and do not hesitate to ask for clarification at any time. You may decline to answer any question or refuse to participate at any time. If you decline questions or your participation, this will not affect your relationship with the researcher nor the services you will receive from the university now or in the future. If you participate, your answers will remain confidential. In the report on the study, you will not be personally identified with the information you provide; your comments will be combined with the responses of other participants or a pseudonym will be used. Your name, phone number, and email address will be securely stored by the researcher for 5 years and then destroyed. Do you have any questions about the interview or the study?

Interview Questions

General Questions

(1) How do you describe your experiences as a nontraditional student in the teacher education program? (For example, experiences within the university and outside of the university as such as experiences with family, employment, social situations etcetera).

(2) Can you please explain how you are using technology in your courses? (For example, Google Classroom, Blackboard, Skype, Smartboard, presentation and gaming software applications, social networking sites - use answers provided by participants to help guide probing).

RQ #1: What are the perceptions and experiences of nontraditional students about challenges of understanding technology and applying technology into their coursework in a two-year teacher education program?

(3) Tell me about the technical challenges if any, you've encountered while using technology for learning in the teacher preparation program.

Probing Examples:

i. In what ways if any, do you encounter technical challenges associated with in-class activities, completion of your assignments, and fieldwork?

ii. Do you encounter challenges related to the use of hardware or software? If yes, can you please explain?

(4) Do you experience difficulties with internet connectivity? If yes, can you please explain? Why do you think the technical challenges are happening?

Probing Examples:

For example, would you attribute the technical challenges to unclear directions, lack of knowledge/experience about the use of technology, lack of time to practice using technology, connectivity problems?

(5) What are your perceptions on how the technical challenges could be reduced? (For example, student, instructor, or institutional factors).

RQ #2: What are the perceptions and experiences of nontraditional students about success in understanding technology and applying technology into their coursework in a two-year teacher education program?

(6) In what ways are you successfully using technology for learning in the teacher preparation program?

Probing Examples:

(Use answers provided in Question 1, regarding how technology is used to gauge probes.)

i. In what ways are you successfully using technology in completing in-class activities, assignments, and fieldwork?

ii. Are you successful in using hardware and/or software? If yes, can you please explain?

(7) What are your perceptions on what factors contribute to your successful use technology in your program?

Probing:

i. For example, would you attribute your success in using technology to your knowledge/experience using technology?

ii. Would you attribute your success to institutional support- support from instructor, resources provided in courses, time allowed for hands-on practice?

iii. Would you attribute your success to out of class support?

Conclusion

Those were all the questions I had for you today. Thank you so much for your responses. I greatly appreciate your time and effort. Do you have any questions or comments? Please do not hesitate to contact me if you have questions or comments. I can be reached at XXXXXXXX. Before we wrap up, I want to let you know how I will proceed with the data I collected from you. I will transcribe the audio-recording of our interview verbatim. Within one week from today, I will send you by email a summary of the findings from your interview so you can check if your views were correctly captured. Your participation in this study is highly appreciated. Thank you.