2020

Low Adoption of Digital Technology Among Indigenous People in Guyana

Volda Elliott
Walden University

Walden University

College of Education

This is to certify that the doctoral dissertation by

Volda Elliott

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

Review Committee
Dr. Gladys Arome, Committee Chairperson, Education Faculty
Dr. Colleen Paeplow, Committee Member, Education Faculty
Dr. Narjis Hyder, University Reviewer, Education Faculty

Chief Academic Officer and Provost
Sue Subocz, Ph.D.

Walden University
2020

Abstract

Low Adoption of Digital Technology Among Indigenous People in Guyana

by

Volda Elliott

MA, Walden University, 2015

BS, University of Guyana, 2002

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Educational Technology

Walden University

December 2020

Abstract

Training is a vital component for crystallizing acceptable technological classroom practices. Still, Indigenous Amerindian preservice teachers needed first to acquire the skills and overcome the technological barriers to better prepare learners beyond the classroom. Even though internet access would allow Indigenous Amerindians in Guyana to develop technology literacy skills and access educational resources, Indigenous preservice teachers have a low rate of technology adoption in the classroom. The purpose of this basic qualitative study is to discover the perceptions of Indigenous Amerindian preservice teachers about the adoption of digital technology in the classroom. Rogers's diffusion of innovation theory and David and Venkatesh technology of acceptance model were used to understand Indigenous Amerindian preservice teachers' perceptions about the use of digital technology, perceived barriers, and the coping and adopting mechanism throughout their pedagogical practices. Ten Indigenous Amerindian preservice teachers participated in this qualitative study. Semistructured, interviews were the primary data collection tool. Open coding was used to generate themes, and analyzed emergent coding. Findings showed that the rate of adoption of digital technology could accelerate if (a) training is strategic, (b) reduction of institutional barriers, and (c) professional practices are aligned for educational growth. This study contributes knowledge to the field of digital technology and furthers understanding of pedagogical practices. The findings may contribute to positive social change in that professional development centers can improve skills that provide flexible learning for IAPT to integrate digital technology beyond the classroom. and serve as a catalyst to promote growth by capacity building.

Low Adoption of Digital Technology Among Indigenous People in Guyana

by

Volda Elliott

MA, Walden University, 2015

BS, University of Guyana, 2002

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Educational Technology

Walden University

December 2020

Dedication

I dedicate this dissertation to my hard-working, caring and loving mother and mentor Bernadette Athalene Peterkin. Even though she became a victim of a stroke, her prayers and words of encouragement kept me moving in the right direction. I would like to acknowledge my dedicated, consistent, and fantastic companion, Mr. Neil Boston for his indefatigable support and uplifting encouragement with a nudge along the way. His philosophical presence was the most excellent tool that I have received. I am genuinely thankful to God for him in my life. Also, I would like to thank my children Shequia, Michael and Shekeina, for allowing me to spend long hour's writing papers, reading journals, and surfing the internet just to satisfy my dream. Finally, I would like to thank my brothers Cecil, Keith, Nicklon and Shem; sisters Karen, Myrna and Robin; nieces, Althea, Kei-ann, Keisha, Shemika and Palesa , and uncle Rudolph for words of encouragement. Thank you from the bottom of my heart.

I can say is "To God be the glory great things he has done"

Acknowledgments

If it wasn't for my Heavenly father who was on my side, Walden University would not have had the opportunity to fashion me. I would like to take this opportunity to thank Dr. Gladys Arome (chair) for her unwavering support, patience and guidance throughout my dissertation journey. Dr. Gladys Arome made the transition very smooth when she took over from my previous chair, Dr. Salmons, who also helped me massively in shaping my proposal. This dissertation would not have been possible without the endless support and continuous guidance from Dr. Gladys Arome.

Special thanks to my committee members Dr. Timothy Powell, who believed in me and stayed with me throughout my proposal and Dr. Colleen Paeplow who joined the committee at the end of my proposal. I also would like to thank my University Research Reviewer, Dr. Narjis Hyder for her feedback with words of encouragement to keep this project moving.

I also want to signal gratitude to all my professors who contributed to my academic journey as a doctoral student and guided me throughout this excellent journey. Finally, my friends and family especially Ms. Karen Elliott, Louise Hall, Joy Nurse, Myrna Peterkin, Shanudel Phillips and Robin Simon for their time and support throughout this journey. Thank you for your steadfast care and words of declarations.

Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction to the Study

Introduction

There is a growing concern in modern societies about understanding the intricacies surrounding learning among ethnic groups within the formal classroom structure and how to educate these groups in keeping with current learning standards (Ankiah-Gangadeen, & Nadal, 2018). A similar concern exists in Guyana, among the Indigenous population (Menezes, 2017). Indigenous peoples in Guyana are descendants of the first inhabitants who occupied the country before the arrival of the Europeans (Menezes, 2017). They are referred to as the Amerindians and have their settlements in Guyana's most remote interior areas. Despite this reality, Indigenous Amerindian preservice teachers are expected to be exposed to similar services, and use the same tools, like those used by other teachers who live in close proximity to Georgetown, the capital city. In addition, educational outcomes of Indigenous Amerindian learners are expected to be the same as those of the other learners throughout the country.

To enable the realization of these expectations, special provisions were made by the government, in light of the frequent cries of marginalization, especially in the field of education (Granger, 2017a; Hughes, 2018b; Ramsey & Deana, 2018). This resulted in teachers from the remote areas being brought to the coastland to receive instruction at the only Professional Development Center in the country to be part of the preservice teacher-training program (Ministry of Education, 2018). Indigenous Amerindian preservice teachers at the Professional Development Center originated from various Amerindian

settlements and communities and are exposed to the same degree of digital technology as those from the capital city and the coastal areas in Guyana. For unknown reasons, the digital technology adoption rate seemed to be lower among Amerindian communities (National Center of Educational Resources Development , 2018a). Besides, the Ministry of Education of Guyana recognized that the low adoption rate may linked to the teaching and learning methodologies that were previously utilized in order to impart knowledge in the respective Indigenous Amerindian communities (National Center of Educational Resources Development, 2018a). Further, there were underlying perceptions within the education fraternity that teachers needed to master skills that would provide learners in indigenous communities with authentic experiences to adopt digital technologies (Chance et al., 2019; Nasruddin, 2018).

Khan (2018) opined that even after Guyana gained independence from Great Britain during the nineteen sixties', the Indigenous Amerindian have continued to be marginalized. This, he claimed, was reflective of the policies and practices of the precolonial administrators. In order to inform decision-makers, administrators, and educators, about the challenges of Indigenous Amerindian preservice teachers' adoption of digital technology in the classroom, it was therefore relevant that in-house training sessions be conducted to enhance the decision-making process. It may have the potential to eventually motivate the Amerindian teachers to integrate digital technology into their classrooms rapidly. Subsequently, it was hoped that each Indigenous Amerindian group would have made make the necessary adjustments to embrace digital technology

integration without eliminating their native perceptions. Recent researchers had noted that integration of technology initiatives in rural areas had to be strategic and practical because of communities' remoteness and economic status, which might would affect how individuals embrace change (Beaton & Carpenter, 2016; Gillan et al., 2017).

The process of change is not systematic. People envisage growth at a different speed and sometimes get stuck in the process (Serdyukov, 2017). It can give rise to either rejection or acceptance. The degree of adoption of change is embedded in one's personal experiences, perceptions, attitudes, and beliefs that cannot be disregarded (Balbay & Erkan, 2018; Gamage & Tanwar, 2017). Within the process of change, Indigenous Amerindian preservice teachers' adoption can be measured at different stages based on their exposure to digital technology. Change may occur due to increased exposure to technological skills (Bates, 2017).

However, for change to be meaningful, Indigenous Amerindian preservice teachers must first challenge themselves to learn new teaching skills that can create educational improvement within their communities. The likelihood of positive change increases when the personal needs of the Indigenous Amerindian preservice teachers are discovered and addressed. The adoption of digital technology can increase when Indigenous Amerindian preservice teachers in training have an opportunity to express their perception of the integration of digital technology.

Chapter l focused on the study's background and provided explanations of the adoption of digital technology guidelines for Indigenous Amerindian preservice teachers,

along with current research that has supported the need for this basic qualitative study. I addressed the problem statement, the purpose of the study, research questions, conceptual framework, and nature of the study. Further, I included an operational definition of terms, stated the assumptions, scope, delimitations, and limitations of the study. Finally, the chapter concluded with the explanation of the significance of the study, implications for social change, and the gaps in the literature that supported the need for this study.

Background

The ability to integrate digital technology has become an essential ingredient for the delivery of education in developing countries (Jawarneh, 2017). Since digital technology is changing globally, there was a need for the training institution to create a more robust training plan for Indigenous Amerindian preservice teachers to integrate digital technology into their pedagogical discourse (Jeffery, 2019; Tassel-Baska & Hubbard, 2016; Yeh & Wan, 2019). According to Bates (2017), it is imperative that teachers' training institutions act expeditiously to provide adequate technological learning experiences for Indigenous teachers to realize success in a rapidly changing modernized classroom environment.

A preservice teacher's role is to guide their students to become critical thinkers and problem-solvers in a modernized classroom (Castagno et al., 2016; Sellars, et al., 2018). All teachers are required to learn how to use digital technology in schools, yet training are inadequate in schools in remote areas (Tyler-Wood et al., 2018). Indigenous educators in hinterland, rural, and remote communities were way behind their

counterparts in their technology needs, yet, they were required to use skills in digital technology to move the learners along the continuum. Policymakers and administrators often lack the skills necessary for systematic change and technological integration into long-term reorganization procedures of a teaching program (Neiterman & Zaza, 2019; Pincus et al., 2017; Townsend et al., 2017). The Ministry of Education, National Center of Educational Resource Development (NCERD, 2018a) posited the need for technological integration throughout the education system to provide teachers and students with opportunities to become technological thinkers and planners. In addressing the issue of technology integration into the curriculum, (NCERD, 2018a) explained that the United Nations Educational Scientific Cultural Organization (UNESCO, 2018a) mandate promoted the theory that technology fosters good pedagogy innovation. It is further stated that technological integration was met when the teaching environment utilized tools to encourage new methodologies and strategies for teachers to deliver the curriculum (Hughes, 2017a; Ossiannilsson, 2018; UNESCO, 2019b). Therefore, effective integration of digital technology by Indigenous Amerindian preservice teachers may be hindered by teachers' perceptions, particularly if the populations were less likely to have access to the technologies (Litz & Scott, 2017; Parkman et al., 2018).

Education is a vital component for crystallizing acceptable technological classroom practices. Still, Indigenous Amerindian preservice teachers needed to first acquire the skills and overcome the technological barriers to better prepare learners. The International Society for Technology in Education (ISTE) and UNESCO has

recommended appropriate technological standards for teachers, students, and administrators. Guyana's present educational climate had set standards for technology integration. There was no doubt that digital technology was used extensively at the training institution for training and learning. UNESCO's ICT competency framework supported the enhancement of preservice teachers' and students' skills as aligned with teacher education at the training institution (UNESCO, 2019b). In support of the framework competencies, there was a need to continuously train Indigenous Amerindian preservice teachers to be more grounded in the integration process of digital technology within their classroom.

Training without follow-up for Indigenous Amerindian teachers will reduce digital technology adoption in the classroom (Townsend et al., 2017). Hence, it only fits Indigenous Amerindian educators to be equipped with the resources needed to integrate technology in a modernized classroom. Several studies have also indicated the need for policymakers to sustain the implementation of technological training for all educators beyond college (Haynes & Shelton, 2018; Hughes, 2017a; Showalter et al., 2019). If Indigenous Amerindian preservice teachers continued to use the first teaching method, then the adoption of digital technology would not become a reality (Geng et al., 2019; Lamb & Weiner, 2018). Indigenous Amerindian preservice teachers needed to be exposed to technological skills to advance pedagogical tools that would have enhanced the curriculum's delivery. With the rapid evolution of digital technologies, administrators and policymakers understand the need for Indigenous Amerindian preservice teachers to

use digital technology in their classrooms. These needs must be addressed to enable Indigenous Amerindian teachers to become adopters of digital technology.

According to Spiteri and Rundgren (2020), there are many strategies that will allow Indigenous teachers to use digital technology to assist students in achieving their full potential. It has further shown that preservice teachers use digital technology while in training in many schools; however, it has been noted that teachers generally lack follow-up support after training.

Problem Statement

The problem addressed in this basic qualitative study was the low adoption rate of digital technology in the classroom by Indigenous Amerindian preservice teachers. Even though the internet access would allow Indigenous Amerindian in Guyana to develop technology literacy skills and access educational resources, Indigenous preservice teachers have a low rate of technology adoption in the classroom, according to the Guyana National Development Strategy (NDS, 2017). Education Officers in Guyana had observed that over the years when Indigenous Amerindian preservice teachers entered the Professional Development Center, approximately 95% of them lacked the necessary skills needed to utilize digital technology (Ministry of Education, 2018). Consequently, Indigenous Amerindian preservice teachers had to undergo intensive training to acquire knowledge to become competent in instructional technology. It was further posited that intensive training could boost Amerindian teachers' confidence when teaching Amerindian students how to use digital technology (Min et al., 2019; Tyler-Wood, 2018).

Hence, there was a need to understand Indigenous Amerindian preservice teachers' perceptions about the use of digital technology by establishing baseline research.

The Professional Development Center in Guyana was the ideal setting to study this issue. Since it was the principle Professional Development Center, they were tasked with the role to effectively prepare Indigenous Amerindian preservice teachers with appropriate teaching methodologies so that they could function in the classroom. The introduction of digital technology in the teacher education program at the Professional Development Center in Guyana dated back to the early two thousand (Ministry of Education, 2018). Although there are growing bodies of research on digital technology in preservice teachers' education programs in developed and developing countries (Jita, 2018; Sauers & McLeod, 2017), there is a gap in literature relating to Indigenous Amerindian preservice teachers' acceptance-in implementing digital technology at their indigenous location. As such, not much was known about Indigenous Amerindian preservice teachers' perceptions and digital technology adoption. The United Nations Educational Scientific and Cultural Organization (2018) argued for the implementation of an information communication and technology (ICT) strategic plan for teachers in Guyana. Without the diffusion of technology in the schools, Amerindian students who lack access to digital technology would have the least opportunity to adapt to technological principles. While the use of digital technology is dynamically changing the structure of teaching, there is a gap in the literature concerning the perceptions and attitudes of Indigenous Amerindian preservice teachers and their plan to incorporate

digital strategies in the classrooms of schools serving Indigenous students. This study's outcome could provide knowledge and appropriate support, that may have potential positive social change for policymakers and stakeholders in Guyana toward the integration of a digital technological program.

Purpose of the Study

The purpose of this basic qualitative study was to discover the perceptions of Indigenous Amerindian preservice teachers about digital technology integration in the classroom. To address this problem, the researcher used the basic qualitative approach (Ravitch & Carl, 2016) to discover the phenomena.

Research Questions

Central Question

What are Indigenous Amerindian preservice teachers' perceptions about using digital technology in the classroom?

Supporting Questions:

RQ#1-What are Indigenous Amerindian preservice teachers' perceptions of the adoption of digital technology in their daily pedagogical practices?

RQ#2-What are the perceived barriers to the adoption of digital technology by Indigenous Amerindian preservice teachers?

RQ#3-What are the perceived coping and adapting mechanisms used to overcome the barriers to the integration of digital technology by Indigenous Amerindian preservice teachers?

Conceptual Framework of the Study

The focus of this study was to discover Indigenous Amerindian preservice teachers' perceptions towards the low adoption of digital technology at the Professional Development Center in Guyana. This basic qualitative study used Rogers' diffusion of innovations theory (DOI) and the technology acceptance model (TAM) to design a conceptual framework that examined digital technology's adoption process among Indigenous Amerindian preservice teachers. The theory and model provided a structure to support individual adopters within a specific group. Rogers (2004b) proposed a categorization syst---em for adopters. Huang and Liaw (2018) suggested that technology adoption in the classroom was highly linked to teachers' technological lifestyles. In this study, DOI theory helped to examine the perceived attributes among early adopters, adopters, likely adopters, and non-adopters of the innovation and the demographics of ethnic groups. The DOI theory is similar to the TAM model in that it focused on how individuals within specific groups accept and adopt some technologies. Woodside, Augustine, and Giberson (2017) added that the Technology Adoption Life Cycle possesses elements that allowed potential adopters to embrace digital technology strategically. Drijvers et al. (2017) posited that new ideas take time to dispersed throughout any social group. For this research study, DOI theory expanded the understanding of Indigenous Amerindian preservice teachers at the Professional Development Center and considered their views about digital technology's integration process. Serdyukov (2017) explained that social groups in rural communities have a

varying degree of control over the message received and interpreted. The important concept was that communication could alter or change the views of individuals. The TAM model linked this framework by the perceived ease and perceived usefulness of innovation by learners.

van Wyk (2017) addressed the needs of the digitally-oriented generation of learners in remote communities via DOI theory and the technology acceptance model (TAM). The TAM model applied to the acceptance and usage of digital technology, whereby individuals could engage actively in technological pedagogy within the classroom. Even though this study examined the perceptions associated with the adoption of technology, the TAM model categorized the innovators based on their usefulness. This study addressed the perceptions of Indigenous Amerindian preservice attitude about the adoption rate of digital technology.

Firstly, the framework supported the recognition of the phenomenon of Indigenous Amerindian preservice teachers' low adoption of digital technology at the Professional Development Center. The DOI theory provided an understanding of how and why the Indigenous people embraced digital technology across different communication channels, and why some took a longer time to adopt new innovations than others. The DOI theory was considered the most popular theories researchers used to understand the diffusion of innovation within and across communities (Serdyukov, 2017). On the other hand, the TAM model, which consisted of two constructs, is used to explain the user's motivation toward their attitude and perception of innovation. For this study, all

participants were from the rural, remote regions of Guyana, and the application of the DOI theory and TAM model were used to support the understanding and personal innovativeness of Indigenous Amerindian preservice teachers. The theories were used throughout to explore the attitude and perception of Indigenous Amerindian preservice teachers toward the integration of digital technology, with the focus on the rate of adoption of individuals within a group. In this context, the theories were appropriate for referencing throughout this study, as it served to explain how an individual within ethnic groups could strategically embraced digital technology. Finally, the DOI theory and TAM model that comprised the conceptual framework aided in constructing the research questions that shed light on the perception of Indigenous Amerindian preservice teachers' capability to integrate digital technology into their classrooms.

Nature of the Study

The purpose of this basic qualitative study was to discover the perceptions of Indigenous Amerindian preservice teachers about the low adoption of digital technology in the classroom. This basic qualitative approach investigated a contemporary phenomenon within its real-life context to answer the research questions (Patton, 2015; Sandelowski, 2000). The participants of this study included ten Indigenous Amerindian preservice teachers who were candidates currently pursuing nursery, primary or secondary teacher education programs, at the Professional Development Center. This basic qualitative approach was appropriate for the study since it allowed the researcher to unearth the perception and attitude of Indigenous Amerindian preservice as a group

within an extensive social system. It was revealed at the Professional Development Center that their articulation of the low adoption of digital technology into the classrooms is evident (Al Salami, et al., 2017). It also allowed the researcher to examine the participants' subjective reflections who were located at the Professional Development Center. At the Professional Development Center, teachers were exposed to new skills, strategies, and demonstrations of mastery of promoting learning. Indigenous Amerindian preservice teachers at the Professional Development Center were exposed to technological teaching from simple typing assignments, searching the web, or communicating with lecturers and colleagues using an online platform.

This basic qualitative approach was appropriate for the study because it allowed me to code data and manually analyze them using a combined conceptual framework of the DOI theory and TAM model as the basis for deducing and accepting participants' perceptions. The analysis included emergent themes and repeated words and phrases that appeared in the one 45-60 minutes semistructured and unstructured interviews. Using semistructured and unstructured interviews provided room for participants to communicate freely about their perception of integrating digital technology in their natural setting, provided equality among trainees, built relationships and fostered connectedness among Indigenous people and their learning environment (Caron et al., 2019; Claessens et al., 2017).

Definitions

The following section provided definitions of some important terms that were used in this study.

Attitude: The way you feel about something or someone, or a particular feeling or opinion" (Tormala & Rucker , 2018). In this study, attitude was a representation of Indigenous Amerindian preservice teachers' level of judgment about the use of digital technology as a pedagogical tool.

Diffusion of innovations: "A process by which an innovation is communicated through certain channels over time among the members of a social system" (Rogers, 1995a, p. 5). An innovation is "an idea, practice, or object that is perceived as new by an individual or other unit of adoption." Therefore, the diffusion of innovations was a "special type of communication concerned with the spread of messages that are new ideas" (Rogers, 1995a, p. 35).

Digital technology: Refers specifically to information technologies that enable access to education (Pettersson, 2018). According to Sarker et al. (2019), this includes "the new wave of information and communication technology (ICT), including internet-based communication and transaction systems, mobile devices, computer integrated telephone, groupware, workflow and multimedia" (p. 2).

Indigenous Amerindian: Any citizen of Guyana who — "(a) belongs to any of the native or aboriginal peoples of Guyana; or (b) is a descendant of any person mentioned in paragraph (a)" (Amerindian Act, 2006, p. 6) Indigenous Amerindian are persons who

belong to nine Indigenous groups native to Guyana located in all administrative regions or any citizen who was born in Guyana and belonged to any of the nine Amerindian tribes or aboriginal people of Guyana;

The definition included descendants from inter-marriages of any two persons originating from any two Amerindian tribes located in Guyana's administrative regions and any person from Amerindian lineage and resided in the rural areas of settlements found in the administrative regions.

Instructional technology: The Association for Educational Communications and Technology (AECT) had defined and redefined the field of digital technology over the years to respond to changes in emergent technologies, theories and functions of digital technology professionals' resources for learning in the field of education (Allen, 2017). In this study, digital technology is building a digital learning system and feedback mechanism into the teaching and learning process that is dynamic to each Indigenous Amerindian preservice teacher's technological learning experience and is designed for improving the delivery of the subject matter.

Innovation: Rogers (1995a) defined innovation as "an idea, practice, or object that is perceived as new by an individual or other unit of adoption" (p. 12). In this study, educational technologies included digital, electronic, or multimedia to enhanced student learning. They are innovations that could boost the delivery of the education curriculum at the teachers' training level and better prepare Indigenous Amerindian preservice learners for college and career.

Perceptions: "The way that someone thinks and feels about a company, product, service, etc." (Ismagilova et al., 2020). In this study, perception was the way Indigenous Amerindian preservice teachers envisaged the ultimate power of digital technology in their work environment and communities.

Assumptions

It was assumed that the Indigenous Amerindian preservice teachers truthfully communicated their perceptions of technology integration and the adoption process. A further assumption is that Indigenous Amerindian' preservice teachers accurately described the obstacles to integrate digital technology that they perceived in their teaching practices and overcoming these obstacles.

Scope and Delimitations

The scope of the study targeted the Indigenous Amerindian preservice teachers from the Professional Development Center in Guyana. This study's scope did not pertain to the administration, lecturers, or board trustees at the institution. This population was not included in the study because they did not instruct preservice teachers how to integrate digital technology into the classroom. Preservice teachers are practitioners and were supposed to be at the helm of integrating digital technology into their pedagogical practices. Additionally, this study's scope did not include the University, the Institute of Distance Education and Learning, the Government Technical Institute, or K-12 grade teachers.

A random sampling method was employed to draw the sample. This allowed me to divide the large population of the Professional Development Center Indigenous Amerindian preservice teachers into distinct strata since it is a fair way of selecting a population sample. Hence, every member was given an equal opportunity of being selected in the sample. A combination of ten Indigenous Amerindian preservice teachers were selected from the Associate Degree program in Technical Teacher Education and Degree in Education inclusive of Early Childhood Education, Primary and Secondary Education. These were representative of the Professional Development Center's Indigenous Amerindian population.

This study's delimitation focused on 10 Indigenous Amerindian preservice teachers from the Associate Degree programs of Early Childhood, Primary, Secondary, and Technical Vocation education at the Professional Development Center. Ten participants were reasonable for this study since it supported the depth of the problem that was fundamental to the Indigenous Amerindian preservice teachers. Additionally, the size had the capacity to provide richly- textured information applicable to the phenomenon under study (Merriam & Tisdell, 2016). Limiting the study's scope would stimulate an understanding of the specific contextual issues associated with the adoption of digital technology by Indigenous Amerindian preservice teachers at the Professional Development Center.

According to Patton (2015), "the basic qualitative study, like the experiment, does not represent a sample," the goal of this basic qualitative research was to "expand and

generalize theories (analytical generalization) and not to enumerate frequencies (statistical generalization)" (p. 15). The scope was limited to the perception of the Indigenous Amerindian preservice teachers' ability to adopt digital technology in their pedagogical practices to reach their highest potential.

The study have not included the Indigenous Amerindian teachers at the teacher training satellite centers in Guyana. The centers were designed to train in-service teachers with a module approach curriculum and minimal interaction with lecturers. Given its focus on Indigenous Amerindian preservice teachers and their ability to adopt digital technology in the classroom, the study involved demographic variables such as age and gender.

Limitations

Merriam and Tisdell (2016) described a study's limitations as a warning of natural expectations or reservations. As a result, this basic qualitative study created some limitations. Patton (2015) explained that the researcher's continuous falsification and biases are potential limitations. Researcher bias potentially limited this basic qualitative study, as I was the sole researcher who collected and analyzed data for this study. Additionally, the researcher's body language and tone of voice during the interview impinged on the study. While the perceptions of Indigenous Amerindian preservice teachers are real, there were not substantial evidence to support these perceptions.

Guest et al. (2017) posited that the validity of a basic qualitative study depended heavily on the number of participants and the amount of data gathered. Thus, the number

of participants and the amount of data gathered for the study was significant. Further limitations to this study included a small percentage of Indigenous Amerindian preservice teachers who have resided on the coastlands for more than twenty years or are candidates in the in-service teacher education program and had no teaching experience. This basic qualitative study did not generalize beyond the Professional Development Center because the Indigenous Amerindian preservice teachers represented all preservice teachers in Guyana.

Furthermore, as an advocate for a holistic approach for integrating digital technology into the curriculum, they were temptations to increase the pace for the teachers to use multiple digital tools to restructure the teaching and learning process during data collection. Thus, to establish honesty in the answers, I ensured that participants remained anonymous and were placed in a comfortable setting during data collection.

Significance

The significance of this basic qualitative study was embedded in three factors. First, it documented the status of digital technology among Indigenous Amerindian teachers as a direct tool. It was responsible for helping Indigenous learners become technologically savvy from childhood to adolescence. Secondly, it addressed an area of research in Guyana's education system that had limited studies conducted (World Bank, 2016a). It also created a favorable environment for policymakers at the Development Center, board of directors, innovators, and other stakeholders responsible for integrating

technology innovation into education. Also, of further significance was the need,to have relevant information, training, and support to successfully execute the process that was beneficial to the Indigenous Amerindian preservice teachers and the wider society. By focusing on these issues, the stakeholders could use this initiative as a foundation for Amerindian preservice teachers to achieve the objective of becoming technologically literate. Finally, it added to the body of digital technology research that has the potential to bring remote, Indigenous Amerindian into adopting modernized technology pedagogical skills.

Implications for Social Change

By placing this study within the body of research about Indigenous peoples and technology integration from various perspectives, it is expected to have the potential to speed up the adoption process of digital technology among Indigenous preservice teachers in Guyana and other developing countries with similar ethnicity types in teachers' training institutions. This research addressed the literature gap about the adoption of digital technology by Indigenous Amerindian preservice teachers at the Professional Development Center. It also provided additional insight into Indigenous people's motivational plan to determine their technology role in the technological global education village. This motivational plan required collaborative participation that could help the Professional Development Center provide a support structure to capture the needs surrounding the adoption of digital technology of Indigenous teachers in training.

Summary

This chapter presented a basic qualitative study to examined the perceptions and attitudes of Indigenous Amerindian preservice teachers' interest in adopting digital technology into the curriculum. Preservice teachers are responsible for creating meaningful excellent learning environments that supported the Professional Development Center's educational goals. It required policymakers and administrators to address the challenges that could stymie the adoption of digital technology and focus on training to enhance Indigenous Amerindian preservice teachers' pedagogical use of digital technology. Addressing these concerns using the DOI theory and the technology of acceptance model TAM provided pertinent information for deeper understanding to meet Indigenous Amerindian teachers' technological needs.

Chapter 2 is the literature review for the study and provides an educational overview of the research. A review of the literature reveled that the adoption of digital technology created challenges for Indigenous Amerindian preservice teachers. Subsequently, adoption of digital technology presented more difficulties for Indigenous Amerindian preservice teachers to integrate digital technology into their pedagogical practices beyond their classroom. Chapter 3 identified the methodological approach for this study. Chapter 4 and Chapter 5 presented the research results and concluded with a summary of the research and recommendations for future efforts.

Chapter 2: Literature Review

Introduction

This basic qualitative study aimed to discover the perceptions of Indigenous Amerindian preservice teachers about digital technology integration in the classroom. The perception of the lack of technological exposure by Indigenous Amerindian teachers in rural and riverine schools is the problem that prompted this study. In today's modernized classroom, digital technology is rapidly changing the pedagogical process and modernizing schools in developing countries. According to the Ministry of Education Department of Curriculum Planning and Designing in Guyana (NCERD, 2018a), the educational policy and vision are based on the principles that were learning through digital technology that can prepare teachers in training with adequate skills to be successful competitors in a global economy. Hence, it is becoming increasingly important for Indigenous Amerindian preservice teachers to demonstrate their full potential in a dynamic environment.

Appreciating the impact of digital technology on everyday life, the Professional Development Center is trying to restructure their curricula in order to bring Indigenous Amerindian preservice teachers into a technological learning arena. The restructuring process requires the effective integration of digital technology to capture and sustain learners for maximum professional productivity. Until now, an examination of the execution of digital technology applications indicated that Indigenous Amerindian preservice teachers need extensive exposure to technology to enhanced pedagogical

practices (Ministry of Education, 2018). Therefore, integration of digital technology at the Professional Development Center needs a holistic approach for Indigenous Amerindian preservice teachers to established their technology adoption framework that fits into Guyana's educational goals (Granger, 2019b; Lovett, 2017).

The literature review provided a foundation that aligned with the study by thoroughly reviewing important works, peer-reviewed journal articles, and other related articles to uncover and discuss what is currently known and unknown in the field. With this objective in mind, a chronological approached of literature on the following topics reviewed within the chapter: (a) Historical influences on Indigenous Education, (b) Decolonization of Education, (c) Digital Divide, and (d) Barriers to the Use of Technology in Classrooms. The chapter concluded with a summary of the primary points, which included a discussion on how this study will provide a further understanding of Indigenous Amerindian preservice teachers' ability to adopt digital technology within the classroom, and additional insight to close the gap

Literature Search Strategy

In conducting literature research for this study, I examined the Walden University Library online databases including books and research articles, as well as Education Research Completed, Science Direct, Sage Premier, Directory Open Access Journal, Dissertations & Theses @ Walden University, ProQuest Central, Academic Search Complete, Chronicle of Higher Education (The), Education Source, Emerald Insight, IEEE Xplore Digital Library, Taylor and Francis Online, Thoreau Multi-Database

Search, SocIndex, Google Scholar and OER Commons, to have an in-depth perspective of researchers views on the subject. Searches were conducted using the Boolean method on the following themes and topics including a combination of phrases and key terms as presented in Table 1.

Table 1:

Strategies for Conducting Literature Review

Topic	Themes	Key terms & Phrases
Historical influences on Indigenous Education	Colonialism	Historical development Educational policy Indigenous languages in maintaining identity Indigenous knowledge Land rights and Indigenous peoples Traditional Pedagogical belief Local people and the right to education Adult education in developing countries
Decolonization of Education	Broadcasting	Media in Education Radio instruction Community radio Marginalized people and education Diffusion of Internet Education in remote communities Culturally responsive pedagogy Uniqueness of communication Education and the eradication of poverty Imperialism and globalism Attitudes to integrate technology Rural teaching and development.
Digital Divide	Accessibility	Economic equalities Equitable Accessibility Preservice teachers' readiness Learning empowerment Strategic decision- making Planning and execution of resources Teachers attitude Knowledge resources Digital technology training Lifestyles Technology in teacher preparation Teaching strategies

Topic	Themes	Key terms and Phrases
Indigenous Culture and Education		Indigenous preservice teachers Digital technology adoption Intrinsic barriers Extrinsic barriers
	Diffusion of Technology	
Barriers	The training institution characteristics Indigenous preservice teachers' obstacles	

Note: This table demonstrates the key terms, and phrases used for conducting an in-depth review of literature on the low adoption of digital technology by Indigenous Amerindian preservice teachers.

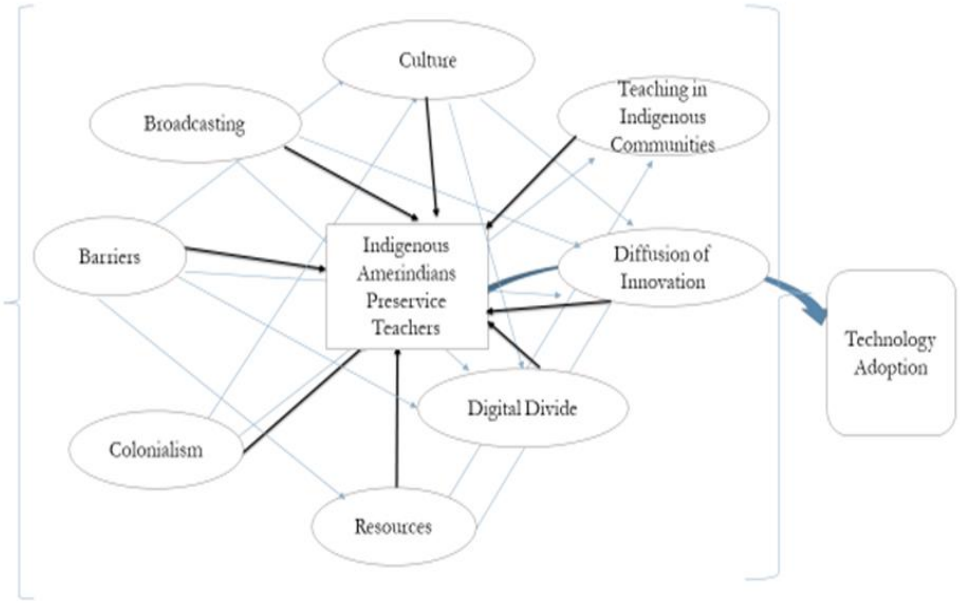
Development of Research Model.

Through the planned evaluation of literature, several connections were captured between the research theme and technology adoption. From this literature review, I identified the commonly cited relationships that exist between the identified themes. This is shown in Figure 1. The connections between the themes are indicated in the model by the arrows. The themes are inductively derived from examining the central theme's literature interaction to align with the research problem. Further, a review of articles referenced on the themes and their relationship revealed that all key terms or phrases have some degree of internal connection that is more commonly discussed than others. These have been blended into an inductive classic in this study. It is important to note

that the adoption of digital technology by Indigenous Amerindian preservice teachers at the Professional Development Center required special attention in this study. It is a widespread term in the body of literature because of its impact on Indigenous teachers' ability to embrace pedagogical changes. Technology integration in teacher education programs is universal; hence, linking it to other factors will be beneficial for Indigenous preservice teachers to adopt new technological innovations.

Figure 1:

Connections Between Research Themes



Note: The figure depicts connections between research questions and research themes to support the pillars for Indigenous Amerindian preservice teachers to integrate digital technology into the classroom.

Conceptual Framework

The purpose of this basic qualitative study was to discovered Indigenous Amerindian preservice teachers' perceptions and attitudes toward adopting digital technology within their classroom curriculum. In this basic qualitative study, the phenomenon of interest methodically examined the views to achieving a thoughtful outlook on the Indigenous Amerindian preservice teachers' plans for adopting digital technology. To establish a framework about the phenomenon, the DOI and TAM were used to provide valuable information about potential adopters' perceptions regarding the low adoption of new technological ideas (Rogers, 1995a; Venkatesh & Davis, 1986). These theories provided additional insight into the continuous use of new technology and factors that impact Indigenous Amerindian preservice teachers' digital technology adoption into their pedagogical practices (Sánchez-Prieto et al., 2019).

Theories

Rogers' DOI defines diffusion as a process in which innovation is used as the foundation for the adoption of new ideas by potential adopters within a social system (Anand et al., 2018; Min et al., 2019; Rogers, 2004b). For an in-depth understanding of individual variations within a social setting, the TAM was chosen as a framework for this study. The TAM proposed that if users perceived ease of use (PEU) and perceived usefulness (PU) is high, then acceptance will be noteworthy for potential adopters (Akhlaghpour & Lapointe, 2018; Clark-Gordon et al., 2019; Huang & Liaw, 2018). Many researchers used TAM to determine the perceived utilities and ease of application,

determining an individual's attitude to adopt new technologies within a system (Mital et al., 2018; Verma & Sinha, 2018). This study focused on the overlapping contracts of DOI and TAM to trace how variables impact individuals' beliefs, attitudes, and intentions to adopt new innovations.

In the literature review, Roger's theoretical framework of DOI and Venkatesh and Davis's TAM model have both been beneficial for illustrating the principles that support the adoption of new practices within a social system. Effective communication was viewed as a critical tool for individuals within communities to adopt an innovation (Akhlaghpour & Lapointe, 2018; Johra et al., 2017; Rogers, 1995a, 2004b). The principal aim of DOI was to understand the adoption of innovation through four elements of diffusion: innovation, communication channels, time, and a social system (Waisbord, 2018). As pointed out by Wang et al. (2018), relative advantage, compatibility, complexity, observability, and trialability of the innovation theory were the main attributes that positively correlated with a community of learners to become makers of technology. Many researchers have extensively utilized these attributes to explain the integration of technological innovation (Raman et al., 2018).

Among the attributes, only compatibility, complexity, observability, and trialability have been consistently identified as critical adoption factors for Indigenous peoples (Delany et al., 2017).When theorizing the contributing factor of Indigenous innovation adoption, research recommended that it is essential to look at the attributes and diverse perspectives of adopters (Bullen & Roberts, 2018). Rogers (2004b) theory of

attributes states, "the perceived attributes of innovation are one important explanation of the rate of adoption of an innovation" (p. 219). The theory also states that an innovation is perceived based on relative advantage, compatibility, complexity, trialability, and observability variances.

Venkatesh and Davis's TAM (2000) has predicted human behavior toward accepting or rejecting innovation. To appreciate the process of adoption by potential adopters, Venkatesh and Davis made suggestion about user's motivation and Rogers' five attributes, together with elements as innovation, communication channels, time, and a social system, used by researchers as outcome predictors for potential adopters to accept or reject an innovation (Gbongli et al., 2019; Liebenberg et al., & Ellis, 2018; Raman et al., 2018; Venkatesh et al., 2016). These concepts were used to identify principle factors associated with Indigenous Amerindian preservice teachers' perceptions toward adopting digital technology in their classroom.

Moreover, such a process begins with innovation. Innovation could considered as a method or a practice that is perceived as new by potential adopters and considered necessary for adoption (Khan et al., 2019; Solomon, 2017). The characteristics of Rogers' innovation theory supported the explanation of the adoption of innovation by Indigenous Amerindian preservice teachers, particularly at the Professional Development Center, that foster growing interested for survival.

Rogers (2004b) also suggested the adoption of new innovations based on openness by potential adopters. The basic perspective of learning new innovations is

based on categorizing adopters. Innovators (2.5%) — are risk-takers willing to take the initiative and time to try something new; Early Adopters (13.5%) — tend to be respected group leaders, the individuals essential to further adoption by a whole group; Early Majority (34%) — the careful, safe, deliberate individuals unwilling to risk time or other resources; Late Majority (34%) — those suspicious of or resistant to change. The latter category includes those who are hard to move without significant influence, Laggards (16%) — which are consistent or even adamant in resisting change. The categorization of potential adopters is connected to members of a social system based on innovativeness. Such a network has created a social status among members allowing them to embrace changes based on their exposure and knowledge about the innovations. Thus, the rate of adopting digital technology is considered by the relative length of time each member of the system is exposed to. Thus, the diffusion of new innovation depends largely on the two types of adapters: visionaries and followers. Speed is considered the main ingredient for potential adopters to "accept or reject" an innovation (Rogers, 2004b, p.6). Most of the studies that included the DOI theory for educators tend to focused on the categories of potential adopters that predict innovation speed (Girardi & Chiagouris, 2018; Papazoglou & Spanos, 2018; Zeng, et al,, 2018). Potential adopters progressed as a result of their exposure to new knowledge. For indigenous Amerindian preservice teachers to be adopters, their rate of adopting digital technology must tie to five main components of the DOI; knowledge, persuasion, decision, implementation, and confirmation. When potential adopters lack knowledge, they become reluctant to the process. As more

information is released, potential adopters strive to overcome their lack of knowledge, make decisions to accept or reject and move forward with their belief. Rogers believed that an individual has the potential to fit into the five categories of adopters based on their circumstances (Rogers, 2004b).

Recent researchers, (Darling-Aduana & Heinrich, 2018; Jayita et al., 2017; Tajeddin & Alemi, 2019) proposed that teachers' technological proficiency levels should considered when the conversation shifts from passive to active teaching. For such conversation to be effective, the interpersonal channel should become operational between individuals to allowed information to flow so they can "create or change strong attitudes toward new innovations" (Rogers, 2004b, p. 19). The rate at which the information is disseminated is important for widespread adoption or rejection of digital technology. To increased technological acceptance at the Professional Development Center, the instructional strategies that lecturers' used are important for Indigenous Amerindian preservice teachers to intensify their willingness to adopt new innovations (Rogers, 2004b). Cardullo et al. (2018) indicated that organizations that focus on training and communication of core values would easily decipher prophecy into potential adopters' daily action within target groups as the visionary goal to embraced change. Potential adopters couldcan effectively embraced changes when organizations considered their audience and dispersed information through multiple channels.

Rogers (2004b) posited that an organizational structure usually provides a framework for potential adopters to accept or reject an innovation that could change the

dynamics of the Professional Development Center (Cardullo et al., 2018; Elbaz, 2018). Communication at the organizational level can stimulate a series of conversations between individuals with similar and different attributes about the adoption of an innovation. Such approached would allow an individual to shape their perception as they continue to decode messages for fitting information to adopt or reject an innovation. After examining the attributes of technology acceptance for preservice teachers, Farjon et al.(2019) posited that the TAM presented a rationale for potential adopters' attitudes toward the integration of technology.

The model logically helped potential adopters analyze their reasons for rejecting an innovation and take efficient measures to improve their technology usage. A thorough understanding of the model would help adopters robustly predict technology integration in various contexts. Moreover, the PU and PEOU supported individuals' perceptions, principles, and attitudes toward the adoption of digital technology. A gap existed in the literature regarding Indigenous Amerindian preservice teachers' perceptions of digital technology adoption. This gap was primarily noticeable when using Venkatesh and Davis's (2000) TAM perceived usefulness and perceived ease of use highlight factors influencing an individual's perceptions about integrating digital technologies. Chang, and Hsu, (2019) observed a gap in the factors that pertain to perceived benefits, which clearly showed how preservice teachers could use technology in classrooms and their perceived benefits, in connection with their confidence in using technology. It is revealed in this study that the use of digital technology in institutions of higher education should have a

more systematic approach for learners to perceive the usefulness of the tool. As technology is quickly emergent as a feature within the education system, it is an indication to prepare teachers to address this learning environment's plethora of needs.

Integrating digital technology in the classrooms has many benefits and challenges that influenced the decision-making process of Indigenous Amerindian preservice teachers. The perceptions of Indigenous Amerindian preservice teachers' easiness of making technological decisions expand the Professional Development Centers' scope to prepare them better to integrate digital technology into the classrooms. The TAM speaks to the framework of institutions' PU and their PEOU for the acceptance of digital technology. Both PU and PEOU influence individuals' perceptions of the adoption of technology (Davis, 1986). The influences of technology integration go beyond the boundaries of the classroom. In the context of this study, Indigenous Amerindian preservice teachers could challenged their belief systems and formulate new ways for knowledge disseminating and understanding their role in a modernized classroom (Cummings et al., 2017; Hart, 2018; Kurup et al., 2019)

The Venkatesh and Davis's (2000) TAM model was used to support this study's framework and explored the perception of Indigenous Amerindian preservice teachers toward the integration of digital technology into their classroom. It is imperative for training institutions, lecturers, and administrators to remained the key drivers and provide insight into the hurdles and benefits for Indigenous Amerindian preservice teachers to integrate technology skills and strengthen their pedagogical skills. Thus, the TAM model

is essential in understanding why Indigenous Amerindian teachers' may or may not accept digital technology integration into the classroom. According to the TAM model, a person's behavior is determined by their behavioral intention of accepting an invention (Scherer et al., 2019). Such purpose is itself determined by the Indigenous Amerindian preservice teachers' perceptions toward digital technology. As a result, the two factors in TAM, perceived ease of use, and usefulness, like the DOI, could provide Indigenous Amerindian preservice teachers with skills to engaged with digital technology. For Indigenous Amerindian preservice teachers, digital technology use in the classroom would be perceived as useful when they develop a belief that this will help them teaching and having more control over knowledge transactions (Rogers, 2004b). If Indigenous Amerindian preservice teachers' perceptions about digital technology are not aligning with their belief, then the adoption rate of digital technology into their pedagogical practices could be reduced.

Literature Review Related to Key Variables

Historical Influences on Indigenous Education

Guyana, a cosmopolitan nation, is the only English-speaking country on the Continent of South America, a member of the Caribbean Community (CARICOM) and a Commonwealth nation (Caribbean Community, 2018). The Cooperative Republic of Guyana is comprised of six ethnic groups: Africans, East Indians, Chinese, Amerindian, Europeans, and Portuguese. The Amerindian are the only ethnic group that consists of

recognized sub-groups that are located mainly in densely forested and riverine areas of the ten administrative regions of Guyana (Ministry of Indigenous Affairs, 2019).

According to the Bureau of statistics, Guyana recorded a population of 780,211 on 214, 970 Km2, where 90 percent of the total population lives on the coast and more than 70 percent in rural communities (Bureau of Statistics, 2018). The population's distribution is a creation of the nineteenth-century pattern of economic development, which was based on sugarcane cultivation. Although the hinterland was left mainly to the Indigenous Amerindian, the other ethnic groups exploited timber, manganese, and gold from the marginal communities in these areas. The scattered nature of Indigenous Amerindian existence, coupled with remoteness, creates a hardship, poverty, openness, limited diversification, and topographical and physical restrictions (Lovett , 2017).

Upon gaining emancipation from the British government in eighteen hundred and thirty-eight, Guyana began to implement educational programs to transform its education system to that of Great Britain (Granger, 2019b; Jennings, 2020; Menezes, 2017). Like most developing British-ruled countries, Guyana gained independence in nineteen hundred and sixty-six from their colonial masters, Great Britain (Jennings, 2020; Menezes, 2017). A few years later, there was a government change to that of the Forbes Burnham led administration. This administration saw free education from nursery to university as the focus of Guyana's education (Kinkead-clark, 2018). Even though the proclamation for free education from nursery to university was declared, the delivery of quality education to Indigenous Amerindian continues to be troubling. One problem is

that even after independence, the Indigenous Amerindian continued to be marginalized, and this is reflected in the policies and practices of the precolonial administrators (Menezes, 2017; Ministry of Indigenous Affairs, 2019; Taysum & Abery, 2017).

For Prime Minister Burnham, economic development was synonymous with educational development, and democracy. The government's policy was to "feed, clothe, and house the nation" (Granger, 2019b, p.5) for independent and economic progress. Henceforth, the notion arose that governments are responsible for solving educational problems that occur among citizens. The author comprehensively linked the developmental problems to the inadequate distribution of resources among ethnic groups.

British Guiana Colonial Education Policy

To appreciate the root of the educational, disconnect among the Republic of Guyana citizens, one needs to look closely at the focus of The British educational policy and the role of missionaries after the emancipation of slavery (Jennings, 2020; Kaarsholm, 2020). Besides, Ishmael stipulated that the British Colonial Education Policy was about their administrative achievement and how to keep persons under control. At the outset, the British education policy for their colonies took on a universal education role in an uncivilized world to educate citizens with the mission of "conquer and enlighten" (Mangar, 2016 p. 14), even if it meant teaching them about the world with an old-fashioned curriculum and subjects that were difficult to comprehend.

As a result, promoting British ideology and supreme power to the Indigenous peoples meant submission to their master's ruling. It generated a great degree of

resistance among Amerindian and Africans and was expressed in language borrowed from their masters. Ironically, the British education policy was non-existent for Amerindian to change youths' education culture (Harrison, 2018; Mangar, 2016).

This was evident in all the countries that the British government once owned (Granger, 2019b). For education to reach the selected few within the population, wealthy citizens sought private tutors only for boys who wanted to become contributors to the country (Harrison, 2018). Hapless citizens who were not financially stable remained uneducated (Datta, 2018; Mangar, 2016). So, it was not surprising when free education was presented to the former slaves that some felt bitter that the Indigenous Amerindian did not benefit from the offer (Menezes, 2017). On the other hand, the British colonial education system provided a structure of "control and "conquered (Jennings, 2020). Students had to be subjected to the culture, norms, and values of the British without hostility. The British missionaries took on a universal educational role to educate the Amerindian in English Language while engaged in missionary activities within the Amerindian communities (Hall & Tandon, 2017; Menezes, 2017).

Christian denominations laid the foundation of education through the British West Indies because of their effective action to "conquer and rule" the vulnerable within the Empire Moyne, 1940, as cited by Griffith (2018). For the Indigenous Amerindian peoples, "Christian education was seen as a "conquistador," empty label or cruelty, yet it would be an injustice for not compromising with their superiors (Mangar, 2016; Menezes, 2017; Spence, 2018). Amidst the conquistador, there were still true

missionaries who knew that Indigenous people need to maintain their dignity and identity against mistreatment from the British settlers (Jennings, 2020). As such, the Catholic, Methodist, and the Anglican dioceses, challenged the British education system and promoted education based on biblical philosophies and not on organizational structure (Mangar, 2016; Menezes, 2017).

Catholic schooling was of a religious nature and focused on getting the Indigenous Amerindian to receive their lot and become submissive through rigid self-discipline as a result of the education policy (Menezes, 2017). For the Amerindian, that meant full submission to their rulers, schooling was welcomed by the Indigenous Amerindian people across British Guiana and, in return, for the missionaries' services; they often provided (Jennings, 2020; Menezes, 2017). However, not all the Indigenous peoples applauded the Catholic creed (Berardinelli, 2017; Menezes, 2017) as their educational tool, but as the Professional Development Center that provided social services through religion. Still, missionaries (Mangar, 2016) established systems within the Indigenous communities, and constructed educational goals and policies for Indigenous schools, because of their connection to nature. Their policy framework was centered on literacy, vocational skills, and evangelism to meet society's needs (Gill, 2018).

Just before the 18th century's culmination, the concern of Christian education started to mushroom among African slaves and spread instantaneously into the pedagogical arena. Missionaries met the basic needs of the people. They provided schools

with clear educational policy (Bischof, 2019; Dornan, 2019; & Mangar, 2016;) that was then viewed as superior to Indigenous culture (Priyadharshini et al., 2018) in western society.

The Anglican missionary heeded to the call and brought in "six ecclesiastics" (Menezes, 2017) to effectively educate the Amerindian on the principle of national education in Ireland. Menezes showed how the bible curriculum provided active citizenship and character development that amalgamated British and Christian values. Menezes is confident that the people could nevertheless be saved by modernizing the Indigenous people's education, so they can think constructively and develop a unique vision of the world. According to (Raza et al., 2018), the colonies were not uninformed; hence the use of standard curriculum was not an accurate representation of the citizens. This situation about Indigenous Amerindian and getting an education is not ideal but different within British colonies (Dornan, 2019; Swartz, 2019).

To understand the impact of colonialism on Indigenous Amerindian in a British colony, Dornan, (2019) conducted a qualitative study and critically reviewed curricula and syllabi through literature pedagogy and discovered the significant characteristic tenants that sought to question European educational philosophy and a cultural construct which was historically specific and often served a hidden function, of empowering members of a social group. It was imperative that education integration should be created among educational stakeholders because of the construct it forms and imposes various meanings within social groups. In the same article, the authors stated that the official

curriculum maintains a structure to deliver knowledge and understanding of British educational principles. This testifies to the fact that Eurocentricity is an issue and addresses at the cost of ideological loss and practical opportunities. The curriculum's content is richly embedded in dominant Eurocentric values when Indigenous Amerindian traditions and wisdom are not reflected in the British curriculum.

Weuffen (2019) linked some of the British educational goals to Indigenous Amerindian studies that have become engrossed on simple-minded decolonization of Western understanding and practices to transform Indigenous Amerindian social conditions. Hall and Tandon, (2017) argued that European knowledge and ways of learning were to maintain a mainstream education value of colonialism at multiple levels of society. The traditional training policy for colonialism has eradicated Indigenous peoples' fabric, yet Indigenous communities have historically respected their relationship with nature. The development of conventional technologies to sustain Indigenous civilization was used to highlight the weakness of Eurocentric knowledge against Indigenous peoples. For Indigenous people, there knowledge is embedded in traditional norms, social values and nature. These characteristics have depicted Indigenous learning when it comes to the adoption of new ideas. It seems to be that the analysis of this study has deepened the importance of cultural values as the basis for Indigenous Amerindian preservice teachers' perceptions to accept or reject pedagogical changes.

Despite the accelerated rate of changing the direction of pedagogical practices, Indigenous Amerindian preservice teachers should use their traditional method of

learning as the platform to adopt digital technology. This study is significant to the current research since it indicates that some of the challenges of integrating digital technology by Indigenous Amerindian preservice teachers depend on their PU and PEOU. These perceptions toward integrating digital technology are shaped by a system that produces learners who benefit from collaboration.

Baeza, (2017) claimed that even though numerous Indigenous children come to school speaking English, it would be impossible for them to also think in English ways. Moderately, their ways of thinking are much more unswerving with those rooted in their Indigenous language. This belief is supported by several Indigenous researchers (Anderson et al., 2019; Guenther et al., 2017; Rennie et al., 2018; Trimmer et al., 2018) who have petitioned for educators to recognize the structure of Indigenous knowledge into ways to support an inclusive curriculum beyond the classroom. These studies' findings indicate that when catering for diverse learner students, the curriculum must reflect the inclusivity of education, requiring policy, leadership, prudence, and unrelenting support from training the training institutions.

Alignment of curriculum stimulates an inside-outside tone that conveys realities to a deepening ethical investigation. The researchers have shown that inclusivity could change the perception of individual Indigenous Amerindian preservice teachers to accept new pedagogical strategies and increase the diffusion of education. Curriculum inclusivity appears to be a critical factor for Indigenous Amerindian preservice teachers to connect to the movement of technology adoption without having any experience.

Blanc and Hammer (2018) noted that the importance of making education relevant is to have sustained economic development across Ghana's middle-income communities. For the achievement of the educational outcome, the curriculum policy should seek to disrupt colonial educational discourse by changing the "academic orientation" (p. 180). The successive chapters in the article presented examples of studies by Indigenous researchers. All of whom are advocates for in-depth negotiation regarding quality learning for all students in the classroom. Besides, the documents demonstrated a lack of awareness of the curriculum regarding the stigmatization of Indigenous knowledge, language, culture, and understanding. Anderson et al. (2019) suggested that 'the cultural interface is a contested space between two systems of knowledge, where things are not black or white, Indigenous or western' (p.16). There is a risk for Indigenous preservice teachers to embark on realistic experiences while they lack the knowledge to analyze their teaching practices separate from this experience. The preservice teachers should plausibly be muzzling Indigenous voices and averting opportunities for engagement with Aboriginal people from communities local to students' home addresses.

The authors are conscious that teacher education lies in the opportunities to bridge the schools' culture and the authentic voices of Aboriginal learners. Thus, reframing the curriculum should continue to emphasized practices and processes of colonization that are evident in learning at the training institutions. This institutional structure stayed in place until the Emancipation Act's passage in eighteen thirty-four (Jennings, 2020; Mangar, 2016). During that period, the British began to establish primary schools with

the effort to convert the free slaves, indentured laborers from India, and aboriginal Amerindian primarily. Consequently, European colonialists who controlled the legislature issued a proclamation that prevented many children from achieving an education (Baeza, 2017; Parkinson, & Jones, 2018).

The current education structure is laden with the colonial educational system that impacts learning (Aman, 2017; Ezedike, 2019; Guenther et al., 2017; Jennings, 2020). The dangerous effects of not imposing a Global education policy free from colonial specification causes Indigenous youths to accept Western teachings as the ideal educational program (Verger, et al., 2018). Indigenous researcher Berardinelli (2017) alluded that good instructional practices within any Indigenous community will evoke discussions between Indigenous peoples' values and the ongoing debates surrounding educational issues (UNESCO, 2019b). Such practices supported the recognition of Indigenous laws as the curriculum shaper (Jacob et al., 2018) to promote human rights and the contribution of Indigenous knowledge beyond the school doors (Handayani et al., 2019). It is paramount that Indigenous studies, as well as global education systems, acknowledge the holistic nature of Indigenous peoples while thinking about promoting an international education (Handayani et al., 2019; Kovach, 2017). The researchers argued that the way Indigenous people view the adoption or rejection of digital technology often arises from their perceptions. Once Indigenous people become the subject of technology acceptance, then accepting an innovation would depend on the activities that would expose Indigenous peoples to make decisions about the integration of innovation. As a

result, the articles provided information on how the integration of digital technology into the curriculum impacts the perceptions of Indigenous teachers in many ways; however, it did not overlook the fact that training institutions provided the skills to support the process.

The decision stage of the DOI theory (Rogers, 1995a) supported this point. Considering this, it is not surprising that Indigenous preservice teachers at the Professional Development Center are not easily influenced in their decision-making process. Blades and Mcivor, (2017). study about the contextualizing of historical and socio-anthropological literature on Indigenous education in enhancing environmental conservation attempted to critically analyze seventy global pieces of literature studies that capture education systems beyond the classroom doors for Indigenous peoples. A number of elements, not excluding the natural environment, facilitated understanding of how Indigenous men and women in different socio-economic and ecological settings utilized Western and Indigenous knowledge to manage their environment. In the context of this basic qualitative study, the Ogiek Indigenous community has demonstrated their unique worldviews as a result of transformative forces beyond their control. However, continuous intervention is relevant for Indigenous peoples to utilize an educational program without causing any significant imbalance to their environment.

In 2017, McGregor, from the University of Saskatchewan, produced an article that discusses Eurocentrism in Indigenous education to provide appropriate educational experiences of Indigenous elders. McGregor, (2017) used two Indigenous researchers of

Dene and Cree nations to dispense their perspectives based on interviews with Indigenous leaders about traditional education in Northern Manitoba. In this qualitative study, the authors demonstrated the importance of Indigenous knowledge in the education process. Based on personal experiences and wisdom, the elders advocated respect for "Indigenous teaching, spirituality, identity, land, first language, and community" (p.12). Models of Indigenous resilience aim to incorporate Indigenous worldviews to mitigate the effects of adversity within Indigenous youths (Jongen et al., 2019). As reported by the authors, the results of this study showed significant facets by which the application of Indigenous teachings could raise awareness of social and cultural issues to the non-Indigenous community, who could also benefit from a non–Eurocentric Native education curricula. This study showed the potential of Indigenous peoples to adopt and to adapt digital technology through equal education to support and protect their cultural characteristics.

The United Nation's effort to bridge the educational gap should not be underestimated. In fact, the world was charged with an unwavering task of educating the young. Although Indigenous education is connected to the land, every child needed an education in order to survive. The United Nations laid out a global educational expectation framework that focused on equal education.

The Universal Declaration of Human Rights: The Universal Declaration of Human Rights Article 26, adopted in the year nineteen hundred and forth eight, laid out the expectation for education as see in (Sun, 2019)

1. Everyone has the right to education. Education shall be free, at least in the elementary and fundamental stages. Elementary education shall be compulsory. Technical and professional education shall be made generally available, and higher education shall be equally accessible to all on the basis of merit.
2. Education shall be directed to the full development of the human personality and to the strengthening of respect for human rights and fundamental freedoms. It shall promote understanding, tolerance, and friendship among all nations, racial or religious groups, and shall further the United Nations' activities for the maintenance of peace.
3. Parents have a prior right to choose the kind of education that shall be given to their children. (United Nations, 2018, p.6)

The tripartite framework of Article 26 points to the adoption of the three distinguishable educational goals with the institutional training commitment to educating citizens without prejudice. To mark the "International Day of the World's Indigenous Peoples", UNESCO, declared the following:

The declaration has the distinction of being the only Declaration in the UN, which was drafted with the rights-holders, themselves, the Indigenous Peoples. We see this as a strong Declaration which embodies the most important rights our ancestors, and we have long fought. This is a Declaration that makes the UN Charter's opening phrase, "We the Peoples…" meaningful for the more than 370 million Indigenous persons all over the world. … The adoption of the United Nations Declaration on the Rights of Indigenous

Peoples (UNDRIP) is an expression of their rights and place in the global community (p.4). The United Nations calls on Governments to improve access to education and ensure that the vulnerable are not left behind to achieve "Sustainable Development Goals" (UNESCO, 2018a p. 3).

Mass Media in Rural Education

Radio in Education.

Like current classroom technologies, radio technology began with an explosion of the innovation from a microscopic standpoint. Radio was pioneered as a tool in nineteen hundred and twenty to assist with the global dissemination of information through a mass communication process (Bolkan et al., 2018; Davis & Lundgren, 2019). Initially, radio instruction in Guyana had been used successfully to teach subjects ranging from commercial broadcasting to dental hygiene and music appreciation in higher education. Radio technology has been successful in providing direct instruction and enriching curricula for Indigenous learners in rural settings (Allender et al., 2019; Baeza, 2017; Galla, 2018). Radio technology assists educators to take unfamiliar topics to multicultural, bilingual audiences via ways to present the curriculum. Universities and organizations have adopted radio instruction as a universal problem solver and a tool to change citizens' dynamics (Baeza, 2017; Nachtigal & Director, 2019). For an imminent outlook of the role of radio technology within the education arena, 70 colleges and universities tapped into the principles and procedures of the new instructional tool that transformed the dynamics of information dissemination. As the Professional

Development Center numbers increased, so did the demand for radio technology to foster networks and systematically improve learning. Such technology has demonstrated how the dissemination of supplementary learning materials can increase educational awareness and involvement among rural communities. The growing demands of our digital world support the adoption of innovation and creativity beyond the classrooms. This point was supported by variables in the TAM that focus on factors that contribute to technology use. The perception of Indigenous Amerindian teachers to adopt digital technology is not only based on the training put forward by the training institution but the usefulness of the innovation to protect the traditional belief.

Milian and Walker (2019), claimed that radio technology shows potential to promote social and economic development and expansion of formal and informal education in rural schools. The potential of radio technology in rural schools can also transform the pedagogical process and the perception among Indigenous educators by appealing to the cultural fabric of the communities. The more devoted radio programs are in promoting Indigenous culture and knowledge, the greater the chances for Indigenous educators to accept the benefits of digital technology to improve rural communities' educational status and technological infrastructure. Milian and Walker (2019) highlighted the willingness of Indigenous Amerindian preservice teachers to embrace new strategies to support the traditional impact of radio technology to disseminate new methods to protect the vulnerability of traditional practices.

Similar studies conducted in developing countries indicated the role radio technology plays in educating remote villages and subsequently transform the delivery of classroom practices (Tan, 2017;Varanasi et al., 2019). The analysis showed that the objective of using radio technology in developing countries are to transmit general public knowledge and to improve quality. However, in some communities, leaders use radio programs to overcome learning barriers, share knowledge, and amplify learning equalities (Bolkan et al., 2018; Oladeinde et al., 2017). The researchers (Blair et al., 2019; Oladeinde et al., 2017) have shown that mass media could effectively transform the perception of individuals to accept new working ideas. It has been discovered that the use of native languages acts as a catalyst for innovation absorption. In spite of the accelerated rate of digital technology toward the contribution of education, Indigenous Amerindian preservice teachers would successfully utilize new classroom innovations. Hence, the approach is relevant to this study. Radio technology is a reinforcement of how well community education can be used as a tool for Indigenous Amerindian preservice teachers to integrate digital technology to take unfamiliar topics to learners beyond the classrooms' walls. Moreover, radio technology could be a valuable tool to promote the culture, religion, and language of rural communities. Since rural communities provide richness in culture, religion, and language, radio technology should sensitize the residence to capture the attention of societies.

Studies have shown that the momentum of community education in remote regions for Indigenous people to become knowledgeable of 21st Century objectives is

growing. In particular, Torres, (2017) used a "Danish model" to discover the integration process of the Aeta group into mainstream education. The author gathered data from observations, interviews, educational programs, and previous work analysis from nineteen ninety-nine to twenty thirteen (Torres, 2017) The study revealed the impact of community education on minuscule remote communities. Members within the community worked collectively for the common good. However, due to internal support for community leaders, the adult Aeta gained knowledge about their daily work, and children were educated within the community. The community action approach systematically connected culture circles to educational activities that incrementally added to the economic fabric of Indigenous people. Moreover, the study highlighted the downside of community education on the adoption of a new ideology. The study results could be used to change the perception of Indigenous Amerindian preservice teachers in rural communities toward the adoption of digital technology without changing their approach toward the delivery of education.

Other researchers have focused on exploring community education through the use of local dialect and the collection of live experiences with the purpose of promoting sustainable development (Beach et al., 2019; Oliver & Exell, 2020). Community projects have been used to build Indigenous people's trust to embraced changes on topics, including community building and Indigenous knowledge (Asiama et al., 2017; Fitznor, 2019; Nelson et al., 2017). The work of Nelson et al. (2017) is significant because Indigenous Amerindian preservice teachers' first pedagogical experiences are from the

leaders in the communities. The non- formal education system via radio frequency helps Indigenous Amerindian preservice teachers to build internal trust and lay the foundation for the adoption of new pedagogical tools and to compete in global education.

Despite the fact that mass media is used to promote economic development, rural communities continue to suffer, whether in developed or developing countries (Friedmann, 2018). Researchers believed that rural economic development lacks continual cultural and language engagement so that new technological innovation could replace or complement old practices (Salemink et al., 2017). Indigenous people are in possession of strategies to help disseminate information without disrupting their belief system. Various educational programs broadcast on national television, radio, and print media are ineffective because dissemination of information is primarily in the country's primary language. During training, mass media could use radio broadcasts to aid Indigenous Amerindian' preservice teachers' understanding of educational development issues.

Communication Awareness

Notably, Nyirenda et al. (2018) carried out a qualitative study to show how rural women in Malawi are empowered through community radio. Based on data drawn from semistructured interviews and focus groups, the women highlighted numerous hindrances that prevented them from accessing information about their wellbeing. Similar views spread across rural communities that hinder knowledge diffusion (Park, et al. , 2019; Van Mele et al., Rodgers & Salahuddin, 2018). The researchers found that through the use of

mass communication, the participants in rural communities transform their livelihoods to reach a common understanding. The Communication channels in the diffusion of innovation process support the use of mass media as a tool that transfers community members' perception. Rogers (2004b) observed that the flow of information through networks and the nature of networks plays a significant role in communicating an innovation to subsets of potential adopters within communities. The nature of the communication networks fosters awareness among potential adopters with similar or different knowledge about an innovation. But this most distinctive hurdle of strengthening the communication network is that participants are usually quite heterophilous, and it becomes harder for subgroups to make unanimous decisions. Considering the hindrances surrounding the dissemination of knowledge, it is not surprising that Indigenous Amerindian preservice teachers are skeptical of making decisions about adopting digital technology.

Panina-Beard (2018) referred to a study about the use of radio technology as tools for sustainable development in the multilingual of Indigenous languages and culture. They attempted to offer a descriptive analysis that facilitated the use of radio technology to stimulate the general population into accepting national development through the adoption of an Indigenous language. A number of strategies were considered; since British colonial masters had influence over the countries, they once governed (Góngora-Mera, 2017). This was absolutely important, as reported by the author, in a neutral way to show the connotation of Indigenous languages in accepting new innovations (Signori et

al., 2017). The authors indicated that as radio technology is used as the vehicle to drive national technology integration; integrating Indigenous language must form technology acceptance. Therefore, it is likely that without radio communication, the adoption of digital technology in rural communities would be difficult.

Ding et al., (2019) served well its purpose in conveying the importance of utilizing Indigenous language in a manner that enhanced national development. This article's relevance to this study is corroboration of how well Indigenous Amerindian teachers utilized their language through the acceptance of digital technology to provide necessary skills to learners.

A similar concept was discovered in a study that analyzed a system of trouble-free communication and access to technology that is applicable to rural communities (Lenkaitis et al., 2019). In this model, the author collected data from periodicals, articles, books, reports, and websites to establish the relationship between rural development and mass technology. The data revealed that 28% of Indian women in remote regions had access to digital technology as compared to 40% of the men. A question can be raised based on the authors' conclusion that the rapid growth of new technologies and the utilization of training for advanced development require an aggressive education plan for rural communities (Lenkaitis et al., 2019).This issue of educating rural communities continues to attract other researchers' concerns raised by Siefert et al. (2019). The researchers conducted a non- experimental, cross-sectional study using a qualitative method, where they interviewed students, graduates, teachers, and parents from four rural

school districts. They argued that a steadfast education platform is needed for tribal students to develop rich learning experiences. In fact, the data presented revealed that the teaching system in rural schools usually exhibits inadequate professional qualities; in particular, inexperienced teachers, poor infrastructure, and very little accountability. Also, the authors sought to draw a paradigm of how tribal students learn. Lack of tribal knowledge by teachers limits the academic achievement of tribal students. The author concluded that socio-economic factors are barriers to tribal students' adoption of new innovations that contribute to India's citizen development.

It is likely that when Indigenous Amerindian preservice teachers experience low levels of technological exposure, they may not feel competent about the adoption of digital technology or motivated to use the tools and thus achieve only minimal academic success (Fleming & Grace, 2017). By and large, Indigenous people who live in remote rural communities and are exposed to multiple educational barriers are likely to demonstrate little or no passion for new inventions intervention (Siefert et al., 2019). Hence, the perception of adopting digital technologies by Indigenous Amerindian preservice teachers is influenced by their attitudes and behavioral intent to use the technology for educational intent.

In another study Regan et al., (2018b) presented the results of an online survey of five remote communities and their council about digital technology use. They argued that the first group of people used digital technology as a tool for them to remain committed to their tradition and culture under challenging settings. The authors strengthen their

argument on the crux of the critical theory lens that appropriate infrastructure could sustain the societies' fabric without changing the image of members. Learning always exists at the grassroots level, where Indigenous peoples use technology to protect the culture in support of decolonization work in their communities. This study indicated that digital technology improves Indigenous people's self-image and helped them understand their responsibilities and relationships for future generations. Adhikari et al. (2018) elaborated on a comprehensive approach between science and technology to transform the social and intellectual fabric of rural communities.

In the nineteen ninths', educators were hopeful that Indigenous learners would become more integrated into mainstream education to create a balance in education Huson, (2019) and, Elliot and Lashley (2017) proposed an in-depth analysis of the substantial role of interactive radio instruction (IRI) as a tool to balance the dispersal of education in schools. The researchers further disclosed the accessibility of resources to rural communities to create critical change agents that can transform learning in developing countries. Students learn to be active participants and develop skills such as independence, decision making, problem–solving, self- efficacy, and networking. Moreover, they focused on the importance of an inclusive education system that incorporates the multiple intelligence theory (MIT). Such a theory corroborates reasons for Indigenous Amerindian preservice teachers to engage in a conversation that contributes to the diffusion of new teaching innovation tools at the training institution. Moving from not knowing an innovation to implementation, Indigenous Amerindian

preservice teachers can independently use new ideas to develop and integrate critical teaching skills.

Gillan et al. (2017) discussed the importance of recognizing communication as key for Indigenous preservice teachers using technology to enhance their learning experiences and developing pedagogies to connected learning. At the Professional Development Center, the Indigenous Amerindian preservice teachers do not have the time to discover and experience technological activities. Since the Professional Development Center's pedagogical structure is not designed to provide Indigenous Amerindian preservice teachers with opportunities to manipulate digital technology because of time constraints, teachers in schools are beginning to have more real-world exposure to digital technology. Researchers have shown that Indigenous preservice teachers at the Professional Development Center who have established a bond with their lecturers tend to have a better adoptive digital technology rate than those without that connection. This finding suggests that Indigenous Amerindian preservice teachers who connect with lecturers and understand the dynamics of digital technology will have a positive influence on the adoption process of technology. Similarly, when lecturers value Indigenous Amerindian preservice teachers' interest, please treat them with fairness, and set expectations for success. The teachers adopted innovations regardless of their technological exposure.

Parkman et al. (2018) discussed the importance of students using real-life experiences for meaningful learning. They emphasized that Indigenous preservice

teachers can gain knowledge about the use of digital technology, not only at the Professional Development Centers but at the community level. A similar concept about the location for the diffusion of education was proposed by Holland (2019) in their study of shopping as everyday learning to connect formal and informal learning. Effective communication would allow Indigenous Amerindian preservice teachers to participate in activities that promoted digital technology integration. Feedback for colleagues and the communities could help Indigenous Amerindian preservice teachers to develop self-evaluation skills.

Networking

Yekinni et al. (2019) carried out a qualitative study to examine the role of radio broadcasting education programs among farmers in Nigeria. Farmers were selected from Zaria, located in the North-western region of Nigeria, that is populated with agriculture and industrial activities. The experiment was carried out with ninety farmers, and there was a demonstration of similar socioeconomic qualities. The study revealed that 97.8% of farmers received pertinent information about farming practices that educated them on improved agricultural practices. Similar studies conducted in developing countries indicate the effervescent role radio technology plays in breaking educational barriers among locale and subsequently transforms the delivery of classroom practices. Such designs provided key educational competencies to learners. They accepted the idea of utilizing radio to bridge the socioeconomic gap between rural and urban communities (Tan, 2017).

According to Tikly (2019), farm radio forum was developed since around nineteen hundred and fifty in Asia and provides opportunities for Indigenous educators to accept radio technology as an alternative tool for the delivery of educational materials within the classroom. Mass media technology, such as radio and television, not only developed farmers' listening skills but provided a framework for Indigenous Amerindian preservice teachers to enhance their pedagogical techniques by incorporating technological skills from the communities into their classrooms (Lee & James, 2018; Smillie, 2017). Different approaches to communication are effective at different times in the adoption process for potential adopters. Mass media's use to disseminate information about the innovation is viewed as a dynamic social process within the DOI theory. Mass media are most widely used to increase the dispersal of information and bring awareness of the technology. Therefore, the study provides information about the networking systems at the Professional Development Center that could influenced the integration process of digital technology.

Furthermore, Lee and James, (2018) stressed that there is a growing gap between Indigenous Amerindian and their willingness to adopt digital technology. Thus, the study reviewed some of the mass media factors for Indigenous Amerindian preservice teachers to develop confidence when using digital technology in their teaching activities. The more exposure Indigenous Amerindian preservice teachers acquired at the Professional Development Center, the higher the technology process's implementation.

Diffusion of Internet in Rural Schools

The proliferation of the internet and the World Wide Web (WWW) represents a less challenging integration of digital tools that have transformed education delivery in rural schools. Several studies have provided empirical evidence and detailed analysis of the benefits and barriers of the explosion of internet facilities in rural communities and how Indigenous Amerindian preservice teachers can use technology within the education system. Cai et al. (2018) suggested that the internet is uniquely poised to promote individuals' collaborative and comprehensive strategies throughout their training period. The benefits of rural schools having access to the internet are numerous. These include improving communication efficiency, practical teaching, social cohesion, and an educated workforce that will provide citizens a better chance of excelling in the digital era and decrease the digital divide (Park et al., 2019).

Many researchers were successful with the outcomes of analyzing factors associated with the reduction of a digital gap that brings about educational change (Awofala et al., 2017; Hamidi & Chavoshi, 2018; & Sarfo et al., 2017), and accurately establishes a relationship between ICT in rural areas and educational development (Pramanik et al., 2017). Some researchers emphasized organizational aspects and how the organization, the school, in this case, prepares itself for the implementation of change in its structure and activities (Karunaratne et al., 2018). Others emphasized that teachers' attitude toward innovations could change their perceptions toward embracing digital technology (Canals & Al-Rawashdeh, 2019; Elbaz, 2018; Mustafina, 2016). Still, others

examined the contributing factors outside the school to the implementation of ICT-based innovations, like the Interactive Radio Instruction program (Elliot & Lashley, 2017)

Habiyaremye et al. (2019) examined distressed communities in Southwest Alabama that consist of a heavily diversified linguistic population and receiving weak internet signals. The researchers used interviews and questionnaires to determine if internet signals provide emotional support to citizens in distressed communities. The study revealed that citizens in remote communities appreciate the increase of digital signals to meet community technology needs. More positive findings revealed that internet signals open up the delivery channel of information that attracts all citizens, increases collaboration among students, creates a significant change in the combination of theoretical rigor and educational practices among learners, and fosters a more in-depth discovery of innovative solutions that fits the framework of the community

The change in the application of educational practices allowed students in rural areas to take responsibility for their learning by providing instructions for their daily survival and a gateway for the integration of digital technology in schools. Internet connectivity offers opportunities for students to use prior knowledge to discover learning with digital activities (Foulger et al., 2019). The attitudes of students in rural communities toward digital technology could motivate Indigenous learners to increase attendance and their academic progress. In this study, the parrot game was used to help learners improved their understanding of letter-sounds using cell phones. The contest promoted levels of learning ability across multiple learners and provided instant feedback

that acted as stimulants for learners to reposition their educational journey in rural communities.

In more recent research, Park et al. (2019) investigated the use of information technology among learners across seven Southeast Asian countries. The schools in the study received grants from international and governmental agencies that promote developmental activities through the adoption of digital technology. Each country provided a community framework that highlights digital technology's effectiveness and sustainability in a local context. The study concluded that the integration of the internet in rural communities is influenced by decisions ranging from being signatories of an international declaration to establishing domestic aid in creating a practical framework. Moreover, the study provides positive school factors that contribute to Indigenous Amerindian preservice teachers with alternative teaching methods.

Other studies, such as (Akçayır & Akçayır, 2017; Greenhow & Askari, 2017; Rahamat et al., 2017), have found that internet connectivity in rural schools have positive impacts on the education system when the implementation of digital technology is expertly planned to meet the needs of learners. According to data collected from an in-depth qualitative interview with fifteen creative practitioners from remote rural areas, to discover their value and perceptions of internet connectivity in rural Scotland, the study revealed that broadband connectivity is a critical tool for rural, remote communities to showcase their creative skills. Students used a broadband connection to promote rich cultural heritage, strengthen communication, and network for businesses to survive in

remote areas. Similarly, educators use a broadband connection to stay abreast of new ideas and enhance their professional development (Townsend et al , 2017).

Moreover, creative practitioners also showed significant contributions to the educational workforce and economic development when internet connectivity is uninterrupted. Townsend et al. (2017) supported the importance of utilizing Indigenous skills for economic growth in remote rural communities. The relevance of this article was to provide additional insight into internet usage and expose the creative potential of Indigenous people that are geographically displaced. The importance of this article to the study is to highlight the internet frustration for Indigenous Amerindian preservice teachers to involve in the digital technology movement. Access to quality internet connectivity in rural Guyana should allow teachers to discover the multidimensional model of teaching that could eradicate the teacher-centered approach and let students be creative thinkers and applicators. With better internet connectivity, schools in remote rural communities of Guyana could provide digital opportunities and challenges for the different categories of learners. This point was supported by the Diffusion of Innovation categorization of innovators (Rogers, 2004b) towards the adoption of technology where external factors, such as sustainable internet connections, could be an inhibitor or motivator for Indigenous learners to move from laggard to innovators. These factors could impact the perception of Indigenous Amerindian preservice teachers to embraced digital technology and enhanced classroom instruction.

Similarly, Alam et al. (2018) conducted a mixed-method study that determined the impact of broadband usage in remote regions of South Africa. For a more profound perspective of the issue, the researchers interviewed 16 participants ranging from adoption mode of technology, socioeconomic status to education status, and 177 participants who completed questionnaires to validate the data. The study showed that the majority of the population subscribed to broadband connectivity for educational activities, job opportunities and to remain within a social networking community, download of files, creating web content, streaming videos, or working from home. Even though internet connectivity has proven to be a powerful element for educators, rural communities are striving to attain similar technological status by personally subscribing to some internet connection. The study further demonstrated how internet connectivity could revolutionize the teaching and learning process in rural, remote communities attempts to sensitize the importance of time for the adoption of an innovative process as postulated by the DOI theory (Rogers, 2004b) in rural, remote communities. Such an attempt at internet connectivity has led to individual adoption of technology, which revealed that technology could only become applicable in rural, remote schools based on an individual's perception of an innovation over time.

Additionally, the relations between internet connectivity and rural, remote schools have shown to be more involved when consideration is given to education. A recent study on the role of internet facilities in rural schools was conducted by Kumar and Basavaraja (2016), which showed that internet facilities' availability was steady but slowed in the

schools. They also found that the inefficiencies on the part of the government and school authorities impact the technology infrastructure, which resulted in the rejection of digital technology by students and academic scholars in rural, remote areas. Hence, when teachers in rural, remote schools are called upon to exercise similar technological tasks as their counterparts in urban school districts, it creates an imbalance that slows the adoption process.

Whether Indigenous Amerindian people live in urban or rural areas, they strive to use internet facilities. Indigenous Amerindian preservice teachers are equally crucial in introducing changes in the education system. However, Indigenous Amerindian preservice teachers may resist the integration of digital technology as a result of their belief system (Schuck et al., 2018).

Policies and Internet Connectivity

Innovative teaching and learning require the implementation of proper planning and policy at all levels of education strata. Educators and policymakers must both have the same technological vision about the future of education. Saritas and Kuzminov (2017) noted that educational technology policies could provide educators with in-depth knowledge about digital technology operation. The study provided an underlying principle and a vision of how the educational systems operate if technological facilities are integrated into rural, remote schools, and they are beneficial to the pedagogical process, and beyond the walls of the classrooms. Such knowledge could create an environment for the acceptance or rejection of digital technology, as is explained in the

TAM. The construct of the TAM is associated with the perceived access obstacles that explain Indigenous Amerindian preservice perceptions of the adoption of digital technology

Vicary et al. (2017) utilized a community resilience framework to critically review 10 years of digital rural policy agenda programs of the European Union and the United Kingdom commencing from 2005 to 2015 (p.6). The framework targeted digital agenda, which focused on policies and plans that incorporate digital technology for rural community-led approach and community resilience that encompassed social learning, adoption, health, and mobilization. The relationships between rural-digital and resilient communities have provided insight into individuals living in rural communities, adopting or rejecting an innovative idea through local resources. This study illustrated that regardless of ethnicity within rural communities, the degree of struggles with the adoption of technology by the Indigenous Amerindian preservice teachers will depend on their level of beliefs about the usefulness of the innovation. Furthermore, a research study by Lee et al. (2019) has shown that students in rural schools have high expectations on the integration of digital technologies within their classroom, based on governmental intervention. The government's intervention would positively impact the participant's interest in rural schools to utilized internet facilities. The expectation of rural students with respect to access and use of digital technology are a precursor that technology integration could transform rural remote schools' academic structure. This research also showed that integrating digital technologies of Indigenous Amerindian preservice

teachers and students are equally important within and outside of the classroom. For the adoption of digital technology to be effective, Indigenous Amerindian preservice teachers and students need technological support. Technological support would reduce fears and stimulate curiosity among Indigenous Amerindian preservice teachers to develop positive attitudes toward digital technology acceptance. Thus, concerned governmental and non-governmental agencies should commence the process for rural teachers to be technological adopters. Even though the study is not a true representation of the entire rural Indian population, it provided empirical evidence about technological policies and management that are required to bridge the digital literacy gap.

Benefits of Internet Literacy

A common characteristic of digital literacy is that it contains a variety of technological resources that can be accessible to rural schools. Technological services have the potential to provide a wide array of services such as chats, emails, attract learners beyond the classrooms, browsing for educational materials, virtual presentation, completing homework, and developing course modules. Individuals in rural communities are attracted to these services, especially those that have necessary technological literacy skills (Spicer et al., 2019; Timar et al., 2018). Digital services add value to the lives of rural communities by motivating them to develop their communities further. Philip and Williams (2019) posited that classroom teachers in rural communities unintentionally marginalized digital services that add value to the broader society. The findings emphasized the importance of social networking for Indigenous Amerindian preservice

teachers to benefit from the adoption of digital technology. The integration of digital technology and its benefits require first-hand exposure, and a gap exists between the Professional Development Center, who sees digital technology as a comprehensive pedagogical tool, and the Indigenous Amerindian preservice teachers who are potential adopters of the tool.

Several studies have also found that rural communities once exposed to digital literacy tend to have a higher flow of potential adopters, making decisions in the context in which the technology can boost the economic growth of the country (Halili & Sulaiman, 2017; Hartley, 2017; Li, 2016). Similarly, when teachers incorporate digital literacy into their pedagogical practices, students tend to be cognizant of digital technology, make effective decisions and develop stronger analytical skills to assert instructions (Mina, 2019; Sadaf & Johnson, 2017). These findings demonstrated how educators working in Indigenous communities could benefit from learning about students' beliefs, language, and culture when using digital technologies.

Varier et al. (2017) posited that educators working in rural school districts represent a different class of teachers that require different resources to promote the importance of digital technology as a learning tool to improve academic performance. With limited exposure to digital resources, teachers, and students in rural communities do not view the adoption of digital technologies as pertinent and reliable to the education system. Hence, Indigenous educators need the knowledge and skills of digital technology before asked to adopt. Rogers (2004b) noted that rejection and discontinuance of the

innovation are likely if the potential adopter does not have some level of knowledge about how the innovation works before being asked to adopt it. This presents a challenge to rural schools that are asked to adopt digital technology that is plagued with unforeseen barriers. Educators in rural schools need to be familiar with digital technology and how it satisfies instructional objectives before a decision is considered for adoption. This, in itself, creates a digital gap in the training of Indigenous Amerindian preservice teachers because of the complexities surrounding the delivery of the curriculum.

For Indigenous teachers to consider the adoption of digital technologies a success, they must be aware of the technology, understand how to use the innovation, the effectiveness of the innovation and how it could reduce the digital gap among learners. Thus, Indigenous educators need to have an appreciation of how the adoption of digital technology in the classroom could arouse their perception and match their needs and environment. It would also increase Indigenous preservice teachers' chances for successful classroom integration (Parkman et al., 2018). Being able to understand the value of digital technologies, Indigenous Amerindian preservice teachers can still reject the innovation if, when integrating the tools, it does not appeal to their culture and Indigenous knowledge.

Digital Divides

With the mushrooming of technological advances, a multidimensional gap has been established between fractions of a country, societies, or individuals regarding the ability to access and utilize technological skills. Growing bodies of literature have

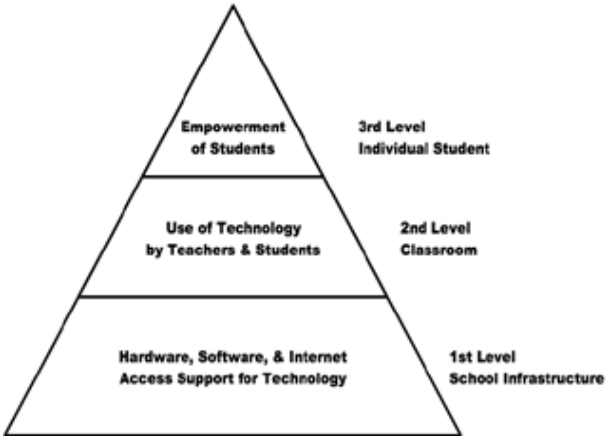
supported the phenomenon as a struggle for digitally native learners, marginalized groups, and socially and economically challenged (Li et al., 2018; Pagán et al., 2018; Rogers, 2016). Given that ICT is increasingly mediating social and cultural participation in the information age, such divides could potentially leave many Indigenous people behind as the phenomenon continues to expand into the educational fabric of schools' societies (Li, 2016; Schou & Pors, 2019; Winter & Boudreau, 2018).

The perceptions of Indigenous Amerindian preservice teachers using digital technology would be free of effort when compared to the technology that demands more skills to integrate into the curriculum. Thus, the perceived ease of using digital technology may be affected by potential adopters' technological self-efficacy (Venkatesh & Davis, 2000). A recent quantitative study conducted by Varier et al. (2017) involved the analysis of a sample of 175 teachers and 293 students in southern Taiwan. 50% of the population originated from urban communities, and the other 50% from poor rural schools. 42.7% of the population was male, and 57.3% were female. Teachers' average teaching experience ranged from 1 year to 30 years. In terms of students, 38% were male, and 62% female. For grade distribution, 3.8% were third-grade students, 21.8% fourth, 38.6% fifth and 35.8% were sixth-grade students. The study discovered significant differences based on gender and geographical location of participants using technology. The teachers exhibit differences between attitudes and levels of experience of technology integration in rural and urban schools. It was clear from the study that the government provided technological policies and resources to decrease Digital Divides among teachers

and students. However, this movement is not always static but stretched along the continuum from equitable accessibility of computers in schools to empowering individuals within a system (Rogers, 2016; Scheerder et al., 2017). This setting could be used as an instrument to examine how Indigenous Amerindian preservice teachers address the issue of the digital divide at the school level classroom and individual levels (Figure 2).

Figure 2.

Digital Divide within the Educational Structure



Note: Model of the Educational Digital Divide. Adapted An examination of seven years of technology integration in Florida schools: Through the lens of the levels of digital divide in schools Hohlfeld, T.N., Ritzhaupt, A. D., Dawson, M. K., and Wilson, L. (2017). Computers & Education, 1 (13), 135- 161

Each level of Hohlfeld et al. (2017) model is associated with factors that continually speak to Indigenous Amerindian preservice teachers' perceptions and their willingness to support a technological learning environment. When digital technology is perceived to empower Indigenous Amerindian preservice teachers, the teachers would be better able to utilize the functions available to achieve different classroom purposes fully. This, in turned, may improve the perceived usefulness of digital technology by Indigenous Amerindian preservice teachers. When Indigenous Amerindian preservice teachers encouraged their colleagues to use digital technology and are willing to comply, they are likely to embrace it. Unfortunately, like the Professional Development Center,

training institutes continued to battle the barriers to change the minds of potential adopters.

Uduji and Okolo-Obasi (2017) recently discussed the impact of digital divides among Indigenous women living in rural communities within the ICT society. For a deeper understanding of the issue, the mixed-method research study targeted 80 women living in rural areas in Spain and focused on knowledge and ICT use. The results yielded that 58% of the participants lacked knowledge of necessary ICT tools. This information provided a foundation for the overall situation facing all five categories of adopters in rural communities about the integration of digital technology. Even if the argument was lacking based on the data collection method, the Cronbach alpha index was administered and yielded a value of 0.921 that provided significant evidence about the importance of digital technology in rural communities. The results' reliability directed the study to many underlying issues and decisions surrounding the five categories of adopters of technology in rural communities, as highlighted by Rogers (2004b).

Rogers (2004b) identified five groups of adopters based on a common social system within a community (a) socioeconomic characteristics, (b) personality variables, and (c) communication behaviors. These features represent variables that can impinge or stimulate the teacher's self-efficacy within each category about integrating digital technology. The rate of integrating digital technology among potential adopters is critical, particularly when considering the development of the digital divide among citizens. The key actors in the acceptance of digital technology are based on Rogers' seminal work (Rogers, 2004b). According to their adoption rate, such work is bounded by the five categories of potential adopters, innovators, early adopters, early majority, and late

majority. Several digital divide researchers (Bayeh, 2016; Choung & Manamela, 2018; Haneem et al., 2019) have conducted qualitative, quantitative, or mixed-methods studies on the phenomenon, and inequalities have been proven to be a principal issue for national development.

Chuks (2017) explored the notion of digital divides and inequalities among millennials in South Africa with specific emphasis on gender, culture, economics, and the improvement of digital literacy. The extensive qualitative study involved 1050 young participants between the ages of 12 and 21 across the Gauteng province. The investigation into digital divides and inequalities among the students relied on variables household consumption, expenditure, demographics, and the utilization of internet services. The research revealed that the diffusion of internet penetrated approximately 40% of the young learners, which represented a qualified ratio of young users of one in four as digital natives. For the diffusion of technology to be effective, more than 50% of the population uses the internet via cell phones. The level of educational and digital inequalities are glaring among males and females regardless of their culture, economic status, and learning styles. The age of learners had a positive effect on the rate of new technology adoption as it contributed to their personal development.

According to the study, culture is considered a significant element that made inroads into the development of digital competencies by providing learners with the necessary tools and skills to critically evaluate information. Conversely, other researchers claimed that the lack of educational exposures to digital competencies could shift personal development dynamics, thus increasing the risks of young learners to gravitate to educational learning materials. Even though digital competencies are valid to assist

marginal communities in improving their academic standard, there remains some underlying fear between the "haves" and "have- not" among Indigenous populations (Grant, 2016; Haneem et al., 2019). In this regard, focusing on technology literacy helped to reduce digital inequalities among Indigenous learners. Technology literacy could support Indigenous communities' base to become receptive to the diffusion process of information communication technology to reap the benefits of digital technology.

Barriers

There have been many challenges with the quality of teaching and learning, which has been a seemingly significant concern for education. As the study and practice of facilitating learning and improving performance, educational technology's capacity attempts to overcome barriers by developing new approaches and frameworks (Tsai et al., 2019). In this setting, information and communication technologies (ICTs) embodied a new paradigm for improving information distribution and helping to meet these challenges (Mxunyelwa, 2016).

Barriers to Technology Use in Classroom

Globally, rural and remote areas share common barriers of discrete and isolated populations with communication, transport, terrain, and climatic obstacles that make education delivery via technological applications challenging. The four most essential barriers recognized in the literature are lack of adequate training (Sánchez et al., 2019), weak leadership (Ávila et al., 2019) and professional development (Burden & Hopkins, 2017), and teacher attitudes towards technology use for preservice teachers (Gyamfi, 2017). Zayyad and Toycan (2018) stressed the impact of the barriers on teachers in training attitude and willingness toward the integration of classroom technology. For

Indigenous Amerindian preservice teachers to accomplish proficiency in the integration of digital technology within the classroom, preparation of the curriculum needs to be accommodating to address the integration process. The availability of resources to accept technology is an essential element of the technology acceptance model (TAM) since it provided a support structure for institutions and potential adopters to embrace digital technology. The TAM model's focus and the DOI theory are to bring about some changes from an economic standpoint and a local value system, social norms, and living habits. Attention to such circumstantial factors provides the rationale for Indigenous Amerindian preservice teachers to practice or accept digital technology as a unique teaching tool. Thus, teacher preparation should stress creating material, concepts, and images by applying technologies to help potential adopters make concrete decisions.

Evers et al. (2016) acknowledged that technology integration in instruction could be accomplished in several ways. However, they concluded that "curiosity, attitudes, and beliefs positively influence teacher's innovation behavior" (p.462). While agreeing with Evers et al. (2016) that technology integration can be mastered are innumerable. Sánchez et al., (2019) research showed that some teaching methods are more organic than others because they have capacities to circumvent and stimulate changes within the various degrees of the Professional Development Center changes in promoting instructional technology. The research reviewed showed that the Professional Development Center climate that targets specific talents and understanding that will lead preservice teachers to integrate technology in the curriculum is profoundly sufficient for innovation adoption (Burden & Hopkins, 2017).

According to Shapiro et al. (2017), many changes were made to accommodate the recommendations of "science, technology, engineering, and math education" to draw attention to the U.S. education system's problems. Changes were also made to support the recommendations of the "Nation at Risk" report. Since the report was published, technological innovations have infiltrated many life structures, which have severe implications for the way the nation ought to prepare citizens to meet the demands of the global job market.

Conversely, Jerotich et al. (2017) argued that teachers' preparation of the curriculum in training the Professional Development Centers had not changed significantly to reflect the needs of a modernized curriculum, which requires retooling with specific skills to integrate technology into teaching. In reacting to inadequate skills for integrating technology at the Professional Development Center. Mason (2018) reiterated that teachers in training are sporadically exposed to new strategies that encapsulate technology integration into the curriculum.

Indigenous Amerindian teachers' perceptions about technology could improve if they are using technology as part of their training. The following research examined the critical barriers that preservice teachers in developing countries encounter in integrating technology in the classroom. Okonji and Ogwezzy, (2019) conducted a study that included 1,330 prospective teachers and 111 teacher educators. The researchers used multiple approaches to establish the validity of the issues plaguing teachers in training as it relates to the adoption of digital technology in their pedagogical practices. They pointed out the significance of classifying barriers of enablers. The categories are: intrinsic (first-order) and extrinsic (second-order), but the British Educational

Communications and Technology Agency (BECTA, 2017) categorized them as external and internal, with the external group representing barriers at the macro-level of training the Professional Development Center and the internal representing barriers at the micro-level within the Professional Development Center. In a similar study, Goktas et al.(2016) stated that "the findings indicated that majority of the administrators and teacher educators believe that lack of in-service training, lack of appropriate software and materials, and lack of hardware are all main barriers for preservice teachers to integrate digital technology into their education practices (p, 26-27)." On the other hand, the qualitative findings of the study revealed the following enablers:

1. supporting courses with an appropriate web page
2. offering more ICT-related courses
3. enhancing the motivation of the teacher educators and prospective
4. teachers in regard to using ICTs in their classes
5. designing ICT-related courses based on applicable activities
6. being role models, as teacher educators, for prospective teachers by demonstrating how to use ICTs effectively in teaching (Goktas et al. 20, p, 2016).

The findings posited that Indigenous Amerindian preservice teachers need to emulate skilled professionals to develop positive perceptions and a high expectation when integrating digital technology.

Okonji and Ogwezzy, (2019) found that some external factors were associated with positive technology integration, including the availability of technology ($r = 0.39$, $p < 0.01$) and support from technicians, teachers, and principals ($r = 0.44$, $p < 0.01$). Additionally, Mwanda et al. (2017) identified secure infrastructure, excellent technical

and instructional support, and equal access opportunities as pillars to facilitate traditional teaching transformation into a constructivist teaching setting. Constructivist teaching focuses on students' autonomy, where their thinking and perception drives their learning (Lindstrom & Niederhauser, 2016). Such approaches helped teachers to build on new ideas as they plan to improve their pedagogical skills during training.

In this study, it was found that the Indigenous Amerindian preservice teachers, when exposing to technological strategies, developed skills that direct towards the integration process of digital technology. Each component of the technology appeals to the preservice teachers' perception to accept digital technology as a pedagogical tool to meet learners' needs. Yet, those that did embraced the new pedagogical strategies in their practices encountered challenges. Since time is needed for students to process technological information, Indigenous Amerindian preservice teachers at the Professional Development Center require time from the administrators to effectively adopt digital technology into their practices. Indigenous Amerindian preservice teachers also demonstrated more understanding from the college administrators in preparing and delivering lessons using digital technology, as highlighted in several recent studies (Gamage & Tanwar, 2017; Johnson, 2019).

Anderson et al. (2018) suggested that educators need to take a more aggressive approach when studying to integrate technology into education. Since digital technology is considered a tool that supports academic success, Professional Development Center should look at the characteristics that promote or hinder Indigenous Amerindian preservice teachers' perceptions about digital technology adoption. Thus, holistic support and readiness of digital technology are paramount for the effective adoption of

technology by Indigenous Amerindian preservice teachers. The more sophisticated the structure for technology support is, the higher and smoother the adoption process.

Indigenous Culture and Education

Indigenous people have described culture through a holistic view that captures the world from multiple dimensions. Culture is a unique lens that delves deep into the Indigenous world that values education, spirituality, and healing and health (Gillan et al. 2017). As the search for Indigenous culture and education widens, it goes beyond language and belief. Still, it gravitates toward communal relationships, communication between potential adopters, problem-solving, ordering of time, and social group decision-making pattern. The common goals of Indigenous communities set the boundaries for diffusion to occur. As the rate at which diffusion occurred within the communities, it sets alternatives for Indigenous Amerindian to become change agents to cope with uncertainties of new ideas. The originality of the ideas in the message content of the communication gives rise to some degree of uncertainty among users. The technology acceptance model (TAM) evaluates communities and their reasons to resist or accept technology usage. The model responded to Indigenous communities' demands in relation to the integration of digital technology in the classroom. For Indigenous Amerindian preservice teachers to embraced digital technology and emulate pedagogical changes, the environment provide positive learning to mitigate alienation and inequality (Granger, 2019b; Menezes, 2017). A gap exists in the literature regarding Indigenous Amerindian preservice teachers accepting digital technology into their pedagogical practices. This gap was conspicuous when using Davis's (1986) TAM model that addresses the PU and

PEOU of a system. Hence, it is time we understand the psychology of Indigenous Amerindian and employ such understanding in promoting digital technology

Mervold (2019) conducted a quasi-experimental study and mixed-method approach longitudinal study to discover the impact of professional development in Te Kotahitanga schools where quasi-experiment was used to capture the culture of students. The mixed-method approached that instituted by the researchers collected over four years from 22 secondary schools. The magnitude of this study captured a cross section of views of students from the international body, New Zealand European, Pacific, and Asian. Such results revealed that schooling experience for Maori learners falls outside their ambit. For real changes to be sustained across the schooling system, there must be corroboration for Indigenous students and their communities. Notably, Mervold (2019) did not investigate whether or not Indigenous teachers' attitudes and perceptions could delay new ideas' adoption.

According to a study done by Jacob et al. (2019) which included the analysis of qualitative data, teacher educators in a community based Aboriginal Bachelor of Education program perceived that learning must center on Indigenous communities. Indigenous learners are multi-talented, multi-cultural, and multilingual and cannot be tested with the same technological tools since they are poorly represented in the curriculum, and their experiences are almost always portrayed as unique. Indigenous Amerindian preservice teachers in training often express their teaching intention based on the curriculum structure without acknowledging the role of Indigenous culture and

knowledge in education. The lack of indigenous knowledge is a precursor to stymie the diffusion process that would lead to digital technology acceptance.

Martell and Stevens (2019) conducted an extensive three- year review of modeled rehearsals that focused on expert teaching practice. Participants were teacher educators from New Zealand, Europe, and others of Indigenous Māori, Pacific Nations, and Asian ethnicities. Upon examining the tapes about learning in Indigenous communities, the infusion of multiple learning strategies seemed critical for teachers to master pedagogical practices. Some researchers indicated the relevance for culturally responsive teachers to align their teaching practices with education goals and standards to deliver a more culturally diverse curriculum (Ellerbrock et al., 2016; Elliott & Davis, 2018). They felt this might present challenges for instructors at the Teachers training college since the curriculum was not designed for a Western approach that eliminates individual ethnic groups from the educational framework. The DOI specifically shows the importance of inclusion for adoption to be meaningful within rural communities.

Value of Technology

Whether formal or informal teaching, technology could change the social, cultural, and educational landscape of rural communities. According to this view, the imbalance and inequalities of information surrounding the importance of technology might have some severe implications for Indigenous Amerindian preservice teachers. They strive to adopt a modern pedagogical tool that embodies Western ideas and values that appear through the exploiting of digital technology. Past and present researchers exploring Indigenous peoples' position in a global arena possessed mixed views about the infusion of technologies into rural communities' principles and practices (Chappell et al., 2019;

Fogarty et al., 2018; Hobongwana-Duley, 2015; & Snyder, 2018). These studies indicated the significance of communication and collaborating with technology to meet the users' experiences in a global economy. The need to understand the delivery of technological information within marginalized communities is a pillar of the DOI theory and TAM model that appeals to adopters. Marginalized groups are increasingly demanding that the government use multiple collective strategies to keep them up to date with pertinent information. If technologists postulated that digital technologies have the authority to transform the socioeconomic, socio-culture framework of communities, then this will have severe implications for Indigenous teachers who are striving to maintain their identity in a world that is controlled by colonialism ideals, values, and doctrine.

World Bank (2016a) suggested that a colonial curriculum's structure and content show hostility to Indigenous people, culture, language, and knowledge. The colonial curriculums speak holistically to one segment of the society and eliminate the contributions of traditional education to the survival and success of Indigenous communities (Black & Hachkowski, 2018). Indigenous communities' educational discourse surrounds a communal achievement rather than a colonialism individualistic success at the expense of social connections that make educational success meaningful. Ray and Poonwassie (2017) posited that the colonized teaching model is not sufficient for providing a modernized educational structure. The model is not the best for the next generation of Indigenous learners who will be facing a world with challenges that they will not be able to address with the current approaches to education. This conflict, which exists between colonial knowledge and traditional practices, has resulted in grave consequences for Indigenous individuals and communities (Ennis, 2019).

Furthermore, educational conflict must be resolved. There must be some degree of trust so Indigenous Amerindian preservice teachers could collectively engaged in the process since their ability to accept or reject new technology differs among potential adopters. Davis (1986) argued that the individual would accept and adopt new knowledge following a path framed by his TAM that is based on beliefs of PEOU and PU of a technology. These dimensions gave TAM the scope to explain the social challenges that exist within Indigenous communities and DOI theory, the frontier to diffuse digital technology.

The gradual loss of traditional customs and practices has created psychological upheaval in Indigenous communities and continues to erode the self-esteem of Indigenous teachers about accepting a technological style of teaching (Ennis, 2019; Fogarty et al., 2018). Even though Indigenous peoples are traditionally oriented, governments still have the right to respect, preserve, share, and maintain knowledge, innovation, and Indigenous communities' practices through multiple communication channels. Based on the DOI theory (Rogers, 1995a), the government as the change agent should achieve widespread adoption of innovation across Indigenous Amerindian communities via communication over time among the members of the Indigenous communities. The descriptions of these elements are identifiable in every diffusion research. The success of securing technology adoption among Indigenous Amerindian preservice teachers is positively related to empathy and the rapid dispersal of information.

Similarly, the rate of technological adoption among Indigenous Amerindian preservice teachers would increase once they are satisfied and passed the positive

attitudes to potential adopters. One means of improving the adoption rate for Indigenous Amerindian preservice teachers is for the government to enhanced the quality of service to the communities. This can be achieved by providing adequate technological infrastructure, training teachers, community leaders, and other Indigenous community members when it comes to technology integration. The more effective communication is between the government and Indigenous Amerindian, the greater the participation and adoption of digital technology by preservice teachers into the curriculum.

Researchers suggested that colonial education's military subjection has physically, mentally, and spiritually changed Indigenous perceptions about adopting an innovation (Fier & Auld, 2017; Ganger, 2018; Menzies, 2019). Diffusion scholars adequately understand Indigenous peoples' perceptions of discontinuance of innovation because adopters often believe that their knowledge is not well known among their greatest change agent (Murphy et al., 2017; Sai, 2018). But, no force has been more effective in persuading Indigenous teachers to make futurist educational decisions than understanding and applying technological principles during the innovation process that is dispersed to all community members. Undoubtedly, the motivation for Indigenous Amerindian preservice teachers to adopt an innovation may not be the same among the categories of adopters within communities. The individuals within the communities who need the new innovations' benefits are generally reluctant due to socioeconomic and other social factors that plague the social system (Barnidge et al., 2017).

With this understanding in mind, Sai (2018) agreed that it is of fundamental importance that Indigenous Amerindian preservice teachers be exposed to the principles of adoption of technology aligned to Indigenous experiences and quality of life. This

study's findings also indicated Indigenous Amerindian preservice teachers' characteristics and their willingness to commit to digital technology fully are ultimately affecting their perceptions. For these reasons, researchers argued that Indigenous Amerindian teachers should increase their understanding of the motivation for adopting digital technology to be motivated and take control of their educational journey in a modernized classroom without eliminating their traditional experiences.

Traditional knowledge is not static but is embroiled in the richness of elements that is often visible in current classroom practices. As complex and unique as Indigenous knowledge is, it always responds to physical, social, and environmental changes. The rationale for Indigenous people to erect barriers around the technology is to ensure that their culture and practices are protected. Unlike non- traditional learners, Indigenous learners continue to promote cooperative success. Besides Indigenous knowledge, the surety of Indigenous property rights and access to their communal lifestyle is paramount for the Indigenous communities to protect that knowledge. Even if the transfers of Western doctrine onto Indigenous communities are less invasive, the adoption of new technologies would be of concern to Indigenous teachers. This is an indication of a possible rejection of the value and benefits of digital technology toward Indigenous people (Barnidge et al., 2017; Heinert, 2016; Murphy et al., 2017; Ray & Poonwassie, 2017; Sai, 2018; Snyder, 2018) indicated that a gap exists in the literature regarding the opportunities of digital technology for Indigenous Amerindian preservice teachers to be change agents for their communities. The gap was noticeable when the TAM model explored the perceptions of potential adopters accepting digital technology. My study

would help fill the literature gap by providing unswerving findings on Indigenous Amerindian preservice teachers' rate of adopting digital technology in the classroom.

Benefit of Technology to Indigenous Amerindian Teachers

The literature volume frequently touts the adoption of technology as a mechanism of autonomy and self-determination for the Indigenous peoples (Sarfo et al. 2017). Several Indigenous researchers shared the valid concern that digital technology could discriminate Indigenous culture, language, and knowledge in a global economy. Advocates of this view believed that comprehensive education is attainable when developing countries have a holistic approach toward transforming the image of rural communities by modifying the educational policies, not only for globalization but to transform the lives of the citizens (United Nations, 2018; Valadez, 2018). In the context of this study, PEOU has a direct and significant influence on the perceptions of Indigenous Amerindian preservice teachers toward adopting technology as a transformation tool within their classrooms.

Sánchez-Prieto et al. (2019) discovered a gap between Indigenous Amerindian preservice teachers' perceptions about the adoption of digital technology and its use in classroom instruction. Indigenous Amerindian preservice teachers are considered as drivers of digital technology that would transform their communities globally. To attract Indigenous Amerindian preservice teachers to integrate digital technology, lecturers at the Professional Development Center should improve the content that fits the learners' needs. The study voiced the concern of the role that was rapidly converging global communication technologies would play in enriching Indigenous people's lives. They

were hopeful that rural communities promote the importance of integrating digital technology into the classrooms.

Lawn et al. (2017) highlight the positive psychosocial outcomes for Indigenous peoples engaging with digital technology synchronously and asynchronously. These benefits include an increase of social networks, deepening the dispensing of information, improving accessibility, and building self-esteem to alleviate problems and improve the quality of life within Indigenous communities. The success of the Indigenous Amerindian within a system is determined by their perceptions to accept the benefits of digital technology within their communities. Knowing the dynamics that shape Indigenous Amerindian preservice teachers' intentions would allow the Professional Development Center to regulate those factors to promote digital technology acceptance. If the technology is not easily used, then it will undoubtedly not be perceived as beneficial for the Indigenous Amerindian. According to the TAM model, a user's perceptions about the system's usefulness and ease of use result in a communication intended to use or not use the system (Venkatesh & Davis, 2000). Thus, this study's focus is not to thwart users, but to capture their perceptions of the use of digital technology to improved their quality of life.

Hernández and Bravo (2019) examined the potential impact of information and communication technology on rural communities. Social capital in Indigenous peoples' development in Ecuador focused on assets of social groups, culture values, practices, and relationships that shape society's uniqueness. The root of this project prudently contends the necessity for bringing Indigenous people out of poverty and marginalization. The adoption of digital technology helps highlight Indigenous Amerindian preservice

teachers' infinite potential for improving their pedagogical skills within the education system. Such possibilities enable individuals to grow and embrace changes within a social setting (Rogers, 2016). The social connection that existed within Indigenous communities has established a gap in the literature regarding Indigenous Amerindian preservice teachers' perceptions of digital technology adoption in schools.

Rakshit (2019) conducted a study in Canada that examined the potential impact of information and communication technology on First Nation communities' social capital. The core of their research thoughtfully recommends further research to expand into the "impact" of digital tools into the overall well-being of Indigenous communities. Lawson et al. (2019) examined the relationship between Indigenous social enterprises and Aboriginal businesses. Aboriginal people were targeted through the social pipeline to evaluate the effectiveness of innovations within their communities. The study revealed that Indigenous business people have demonstrated high self- determination to utilize new technological tools to improve economic development through social engagement. The research has shown that social innovation could transform Indigenous people's perception to accept a new innovative structure for social and economic growth. It has been demonstrated that Indigenous communities could maximize essential skills by integrating technological innovation. Notwithstanding the pressing societal challenges surrounding the integration of technology in education, Indigenous Amerindian teachers will successfully transform their pedagogical practices. Such practices would reinforce how Indigenous teachers could coin traditional and Western curriculum without losing their identity.

Another study by Adnan et al. (2019) examined the use of information and communication technologies for political mobilization in marginalized populations in a developing world. Their research focused on using digital media as a mobilization tool rather than replacing the traditional media within marginal communities. The Mayan communities complemented the traditional method of dispersing information with the aid of digital technology to extend collaborative work beyond their communities. They interpreted digital media as the driver for marginal communities to network, gather, and process new information about their members, also in different places around the world. The Mayan population's collectiveness helped them take advantage of the contributions of digital resources and work with outsiders to become motivated to use innovations. As community members informally become reporters by transmitting text messages and pictures to their social networks, they have opportunities to select the digital media that is easier to be adopted. Despite political, economic, and technological challenges, the Mayan people remained resolute that community networking is strengthened through digital media by sharing information of the communities that supported the preservation of culture. This point kept the adoption rate of innovation in the DOI theory and the perceptions of usefulness, ease of use, and behavior toward digital technology in the TAM model. Potential adopters in marginal communities increased their observability of digital media by experimenting with the technology features that exposed them to similar marginal populations. The researchers demonstrated the usefulness of the innovation and individual's favorable attitude toward changes over time. Even though Indigenous Amerindian preservice teachers are knowledgeable about the challenges surrounding

technology, they are willing to integrate technology at the expense of their time as a means of motivation.

Summary and Conclusion

The major sections of the literature review included historical influences on Indigenous Education at the local, regional, and global levels. Other areas reviewed were mass media in rural education, diffusion of the internet in rural schools, policies and internet connectivity, benefits of internet literacy, digital divides, barriers, Indigenous culture and education, the value of technology, and benefits of technology to Indigenous Amerindian teachers. Indigenous Amerindian preservice teachers serve as potential adopters of digital technology in the classroom for this study. Other literature reviewed included vital components for the study, such as the option for the conceptual framework.

A gap existed in the literature regarding Indigenous Amerindian preservice teachers' perceptions of digital technology adoption into the curriculum. This gap was primarily noticeable when using Rogers's (1995a) DOI supported by Venkatesh and Davis (1986) TAM. This study help filled the literature gap by providing valid and reliable findings on Indigenous Amerindian preservice teachers' low adoption of digital technology into the classroom. This study involved exploring Indigenous Amerindian preservice teachers' perceptions and attitudes towards digital technology that might assist with identifying significant barriers, vision, or motivational plans.

Researchers have examined the problem of the low adoption of digital technology by Indigenous Amerindian preservice teachers in numerous ways. Studies analyzed for this literature review primarily involved the qualitative approach and included a broad spectrum of Indigenous teachers in rural schools. Most of the studies included in the

review focused on Indigenous teachers in rural classrooms, challenges, or technology access in the school's curriculum. Other studies provided a chronological approach and indicated whether significant educational changes have occurred over time for Indigenous preservice teachers to integrate digital technology into the pedagogical process. The studies included the colonial education system and the mass media's role in disseminating information in rural schools. The fundamental challenges to the effective adoption of digital technology are the unwillingness and inability to meaningfully and effectively integrate digital technology into the classroom.

The literature presented on the challenges of adopting digital technology highlights the need for the training college of education to address the attitudes, perceptions, experiences, and beliefs of Indigenous Amerindian preservice teachers approach on the integration of digital technology. Laying the foundation for this study summarized the strengths and weaknesses of Indigenous preservice teachers' perceptions, attitudes, and beliefs that impact their rate of adoption of digital technology in the classrooms. Some of the digital divides in the literature placed into three levels namely; schools' infrastructure, classrooms and individual students (Rogers, 1995a, 2004b, 2016). Data emerged in pieces of literature in the study regarding the perception of Indigenous Amerindian preservice teachers' ability to adopt digital technology is linked to educational policies. Comparing the findings to the historical views on preparing Indigenous preservice teachers showed how the adoption of an innovation has changed over time. Rogers's theory of diffusion of innovations helped to explain the rate of diffusion within homogenous groups.

In chapter 3, I discussed the research methodology for this basic qualitative study. And explained the research study and rationale, as well as the role of the researcher. I addressed issues of trustworthiness related to credibility, transferability, dependability, conformability and ethical procedures.

Chapter 3 Research Methods

Introduction

The purpose of this basic qualitative study was to discover the perceptions of Indigenous Amerindian preservice teachers about digital technology integration in the classroom. This chapter provided a description of the qualitative research methodology applied to this study. It includes the research method chosen, the role of the researcher, and instrumentation for data collection. I described the procedure for recruiting participants, a data analysis plan, issues of trustworthiness (credibility, triangulation, transferability, dependability, and conformability), and ethical procedures followed as part of the process. This chapter includes as well discussion of the methodological design of the study as aligned with the problem statement, purpose statement, and research questions. It continued with the research approach and research study and included a sound design to select research participants, instrumentation, procedures for recruitment, participation, and data collection besides, ethical considerations for protecting participants and established trustworthiness within this framework.

Studies of Indigenous peoples' ability to access digital technology (Louise Starkey, 2020; Prayaga et al., 2017) to utilize technological strategies and maintain their identity (Norton, 2019; Walid et al., 2017), revealed, a range of barriers that affected the acceptance of digital technologies as instructional tools. Based on previous research (Norton, 2019), the question of how Indigenous Amerindian teachers use digital technology for instruction has been answered. There is a gap in the literature about

Indigenous Amerindian preservice teachers' perceptions of digital technology as an instructional tool in Guyana. Therefore, this study has contributed to the knowledge base of Indigenous Amerindian preservice teachers' perceptions concerning utilizing digital technology for instruction.

According to Porter (2017), innovation facilitates a well-planned process for Indigenous educators to balance the changes introduced by technologies into their communities. With integrating digital technologies into the curriculum, Indigenous teachers will expose educational opportunities that support their identity. For Indigenous Amerindian preservice teachers to accept digital technologies, long-term planning should be linked with strong traditional values (Kuru Gönen, 2019)

Research Design and Rationale

Central Research Question

What are Indigenous Amerindian preservice teachers' perceptions and plans about using digital technology in the classroom?

Supporting Questions:

RQ #1. What are Indigenous Amerindian preservice teachers' perceptions of the adoption of digital technology in their daily pedagogical practices?

RQ #2. What are the perceived barriers to the adoption of digital technology by Indigenous Amerindian preservice teachers?

RQ #3. What are the perceived coping and adapting mechanisms used to overcome the barriers to the integration of digital technology by Indigenous Amerindian preservice teachers?

Since an understanding was being sought of Indigenous Amerindian preservice teachers' perceptions of digital technology, a basic qualitative approach with interviews were used for this study. The basic qualitative method helped the researcher to be more intimate with participants to collect data, understand participants' experiences through their lenses, provide a comprehensive and detailed summary of the data with practical terms, and describe the experiences of participants with their words (Alvesson & Sköldberg, 2017; Ames et al., 2019; Brandt et al., 2018). Thus, the interview approach typically served to deepen understanding of the subject where participants re-encounter their personal experiences with the realities of being an Indigenous Amerindian preservice teacher at the Professional Development Center. During the interview process, the recorded experiences of participants highlighted their personal perceptions.

Compared to a basic qualitative study that uses interviews, a phenomenological approach have illuminated participants' lived experiences that required the researcher to engage participants to share their experiences as they related to the same phenomenon (Alase, 2017). However, in a phenomenological approach, the researcher goes beyond the understanding of the participants to make their own conclusion of what happened in the lives of their participants. Alase (2017) suggested that the phenomenological approach

provided the researcher with an avenue to listen to the richness of the participants' experience with the situation and brings together the feelings and perceptions of them.

Even though this study drew from participants' lived experiences within their academic and living environment, the focus of this study was not on their intercultural characteristics, but in their perceptions about the integration of digital technology at the Professional Development Center. It is evident that there is little room for a shared phenomenon as the perceptions of participants at the Professional Development Center should be varied based on their circumstances. A case study approach required the possibility of collecting data from multiple sites via multiple data instruments to explored the participants' perspectives regarding activities and confined programs (Yin, 2017). Since this study involves the authentic experiences of Indigenous Amerindian preservice teachers' perceptions with regard to the integration of digital technology into the classrooms, rather than a global view, the case study approach was not suited for this study.

Other Qualitative Designs Considered

Other qualitative methods that were considered were the grounded theory, narrative, and ethnography. Researchers use the grounded theory approach to analyze unexplained occurrences, discover emergent patterns, and build theories from qualitative data systematically gathered and analyzed (Hogden et al., 2017). There was no need to establish a new theory for this study. The DOI and TAM theories set parameters for an individual within groups to accept or reject an innovation. A narrative approach was not

considered, since the focus was not to develop theories regarding "psychological and social process" (Shamir et al., 2018, p. 6). Thus, there is no need to construct new theories for this study. An ethnographic approach would not have been fitting for this study since it involved studying individual groups' culture over time and direct observation of the participants within their culture (Seidman, 2013). The ethnographic approach would not have fit my study as the focus I was not to study cultural aspects of Indigenous Amerindian preservice teachers but their adoption rate to digital technology..

Thus, a basic qualitative approach was best suited for this study. It was used to discover those situations in which the evaluating intervention has no clear, single set of outcomes (Kivunja & Kuyini, 2017; Yin, 2017). A basic qualitative study focused less on the sample size and more on the data collection method's richness prior to an investigation (Patton, 2015; Tojo & Takagi, 2017). This method stimulated the researcher to use unstructured and semistructured questions, as suggested by (Seidman, 2013), to gather the data for the study. The use of unstructured and semistructured questions had unearthed Indigenous Amerindian preservice teachers' perceptions for a better understanding of the phenomenon without deviating from the topic (Seidman, 2013; Yin, 2017).

Role of the Researcher

Qualitative studies have a magnitude for researchers to interpret, transcribe, and analyze data for a deeper understanding of the phenomenon (Merriam & Tisdell, 2016). In this basic qualitative study, I considered the primary instrument of data collection, via

the use of a single interview instrument for the exploration of data collection and analysis (Mohajan, 2017a; Thorne, 2016). To acquire fruitful data, I engaged participants at the Professional Development Center in a real-world setting, collected and analyzed data from the interviews to eliminate biases I took precursory measures to ensure that there was no personal nor professional affiliation with the selected participants. To remain objective, I created a transparent atmosphere that supported the research and created the following: participant relationship, professionalism, honesty, and shared responses during the data collection processes. In my role as the researcher, I ensured that ethical guidelines were followed to prevent subjectivity in areas about which I am knowledgeable (Bloomberg & Volpe, 2017; O'Leary, 2017; Yin, 2017)

Methodology

Qualitative researchers seek to construct a sample of participants who had contributed to the study, remove potential influences, and ensure generalizability of research (Lindlof & Taylor, 2017; Ravitch & Carl, 2016). Qualitative research comprised human encounters concerning the distinction and opportunities of the explorations' outcomes that could represent the research participants (Daher et al., 2017). Based on this study's purpose, a basic qualitative method was the best tradition because it is used to understand what an individual's perception means in their context (Creswell & Poth, 2017; Mohajan, 2018b). Such experiences are captured by answering the 'what' and 'how' types of research questions (Yin, 2017). For this study, participants were selected from the Indigenous Amerindian preservice teachers attending the Professional Development

Center. The Indigenous Amerindian preservice teachers originated from the ten administrative regions of Guyana. With this in mind, I sought to capture the widespread perception of Indigenous Amerindian preservice teachers about the phenomenon in their working environment. Indigenous Amerindian preservice teachers could adjust the stage for the researcher to have realistic firsthand experiences and provide a rich contextual analysis of data.

Participant Selection Logic

Careful consideration was given to established participant selection criteria for this study since the Indigenous Amerindian teachers were attending the Professional Development Center. This Professional Development Center provided training to in-service and preservice teachers in a two-year program in nursery, primary and secondary education. Indigenous preservice teachers with different perspectives and exposure to digital technology within their disciplines were present in these programs (nursery, primary, secondary education program). For the study to be valid, participants' random purposeful selection reflected the Indigenous Amerindian preservice teachers' population. Yin (2017) suggested that a proper representation of a population should be realistic and accurate for the study to be reliable.

To be reasonable in the process, participants' selection targeted 10 Indigenous Amerindian preservice teachers from the inclusion categories: age, gender, tribe, teaching experiences, and educational programs shared their experiences. Inclusion categories also comprised of participants who were pursuing nursery, primary, or secondary teacher

training programs, at that time ,and who had no teaching experience before attending the Professional Development Center. Indigenous Amerindian preservice teachers who previously worked before entering the Professional Development Center and who had never had any exposure to digital technology, and Indigenous Amerindian preservice teachers with some exposure to digital technology before entering the Professional Development Center, were considered.

Also included were Indigenous Amerindian preservice teachers who were undergoing upgrading training at the Professional Development Center at the time. The size realistically allowed the me to acquire rich data from participants. Choosing such participants to add richness and provide in-depth responses to the data collection process since they had different experiences and beliefs. Therefore, the sampling size would increase the meaningfulness and validity of each shared experience Patton, (2015). Stewart et al. (2017) and Burroughs (2017) suggested that the sample size could reach saturation between one and ten participants for a qualitative study. The size realistically allowed me to acquire rich data from participants. According to Ames et al. (2019), the sample size (N) of a qualitative study was adequate to demonstrate the information's magnitude. Henceforth, a population of ten participants (Constantinou et al., 2017) had produced a rich and in-depth understanding of the phenomena.

Different ontologies considered samples ranging from 1-30 (Merriam & Tisdell, 2016; Stake, 2005; Yin, 2017) for qualitative design. The purposeful random sampling technique was selected since participants were knowledgeable and willing to share their

experiences about the phenomenon of interest. Purposeful random sampling enables the addition of participants who have a connection with the subject under study and who have varied views of the research focus (Ames et al., 2019).

Instrumentation

As a qualitative study researcher, I was the primary instrument in gathering data (Yin, 2017), which exposed participants to a combination of in-depth unstructured and semistructured questions. Interviews were considered a significant and important instrument for this study to establish a framework of conversation that helped me understand the participants' perception of the adoption of digital technology in their classrooms.

A combination of unstructured and semistructured questions to solicit information from the participants was used Appendix C. Each interview session lasted 45-60 minutes duration. Interviews were conducted at the Professional Development Center campus in the Bain Gray Hall at an appropriate time agreed upon by the participants. The interviewed questions were written, and the video of the session recorded with permission from the interviewees, using smart video on the android cell phone and video editor from the Microsoft app store. Researchers are human, with tendencies to influence research. A reflective journal was used to ensure suggestions, comments, and personal interpretation were bracketed to minimize the influences of the data (Vicary et al., 2017).

After transcribing the data, participants were allowed to review the transcripts to verify their accuracy before highlighting the emergent themes regarding the integration of

digital technology by Indigenous Amerindian preservice teachers. The interview was divided into semistructured and unstructured questions to gain an in-depth understanding of the participants' experiences. A comprehensive plan with questions developed to evoke truthful responses presented to each participant during the interview process (Mohajan, 2017a; Ravitch & Carl, 2016). Eight unstructured questions and five semistructured questions captured participants' experiences in natural settings concerning their digital technology integration Appendix A. Conducting the interview using the combination of unstructured and semistructured questions allowed the researcher to be flexible as the conversation progressed and redirection of questions as the need arises. The questions focused on participants' perceptions about the integration of digital technology into the classroom

Procedures for Recruitment, Participation, and Data Collection

Recruitment of participants was built on principles that supported a hospitable environment among potential participants (Burroughs, 2017; Guetterman, 2017). I strived to navigate away from recruiting present and former Indigenous Amerindian teachers who were exposed to the researcher's pedagogical principles and practices. This move freed the researcher from intentional bias. Walden University granted permission to engage participants, and a letter was sent to the Principal of the Professional Development Center Appendix A, seeking permission to include the Indigenous Amerindian preservice teachers to participate in the study. After receiving a positive response from the Walden University Review Board (IRB), the principal was notified for

the commencement of interviews. I provided the Principal of the Professional Development Center with a written document highlighting the criteria for recruiting Indigenous Amerindian preservice teachers for the study. I also made a formal request to have access to include Indigenous Amerindian preservice teachers on the campus in the sample for the study. Based on the guidance from IRB and the site Principal, potential participants were contacted directly for this study. Potential participants were selected for the study for confirmation to be included in the research study and to maintain contact. I notified each participant by distributing a notification via email, which included my name and contact information, the summary and purpose of the study, as well as confidentiality procedures. Follow-up arrangements using emails, SMS text messaging, WhatsApp, and the telephone were employed.

Data Collection

For this study, data saturation was attained with 10 participants. The participants indicated their willingness via WhatsApp message to participate and comply with this study. The number of interested participants remained below 12, I used random sampling to select participants.

After receiving message of confirmation from the interested participants, I welcomed them, explained the study's purpose, and asked if they had any questions. At this point, it was vital to have maintained a tone of cordiality balanced with an open demeanor. The consent issue was looked at for participants, along with their endorsement to participate in the study (Burroughs, 2017; Lindlof & Taylor, 2017). At the study's

conclusion, each participant received a confidentiality statement, a thank you letter, and the researcher's contact information.

The collection of data from the volunteer participants for this study lasted four weeks. Participants were exposed to unstructured and structured interview questions via a face-to-face method at the institution. Interviews play a critical role in a qualitative data study (Levitt et al., 2018). The interview questions are available in Appendix B.

Interviews

Face-to-face interview provided an opportunity for the researcher to learn from the participants. The face-to-face interview provided participants with an outlet to maintain a previously established rapport by me. Moreover, adequate probing questions (Mohajan, 2017a) were used to facilitate the interviewing process for Indigenous Amerindian preservice teachers to add personal or professional comments that may impact their perception of using digital technology into their teaching.

Prior to each interview session, participants were reminded that the process was voluntary; and were given opportunities to asked questions before the interview's commencement. An avenue was provided for those participants who had developed misconceptions of the interview. During the interview, a Voice Recording app for Android Samsung phone and the laptop computer used to record each participant's conversation. Also, I transcribed all interviews using Microsoft Word and assigned codes to the transcripts in Microsoft excel. The confidentiality of the coded data stored in an encryption cloud database for five years.

During the interview sessions, participants presented their experiences with minimal interruption and prompting (O'Kane et al., 2019). Conversations prepared participants with an interactive path to freely express themselves (Meguid, & Collins, 2017). Singer and Couper (2017) suggested that open-ended questions allowed participants to offer as much information about their situation without interruption. Thus, open-ended questions accompanied such conversations. Before the commencement of each interview session, open-ended questions were used to trigger participants' interest in the phenomenon. Probing questions were asked to elicit additional data saturation from participants. Each interview session lasted between 35 and 55 minutes.

Alignment of Research Questions and Data Collection

It is important to align each research question with the method of data collection to achieve an authentic understanding of this basic qualitative study .

Table 2:

Alignment of Research Questions and Methods

	Research Questions	Interview Questions
RQ 1	What are Indigenous Amerindian preservice teachers' perceptions of the adoption of digital technology in their daily pedagogical practices?	Items # IQ 1,3,5.7.8,9,10,11,12,13
RQ 2	What are the perceived barriers to the adoption of digital technology by Indigenous Amerindian preservice teachers?	Items # IQ 2,4,6,8,10,11,12
RQ 3	What are the 'perceived coping and adapting' mechanisms to overcome obstacles to the integration of digital technology by Indigenous Amerindian preservice teachers?	Items # IQ 3,5,6,7,9,11,12,13

Legend: *RQ*= Research Question; *IQ*= Interview Question

As shown in Table 2, the research questions and methods were aligned to discover the perceptions of Indigenous Amerindian preservice teachers and the adoption of digital technology into their pedagogical practices. The interview questions elicited a wealth of information about Indigenous Amerindian preservice teachers' perceptions about digital technology to address the issue about the adoption of digital technology into the classroom.

Data Analysis Plan

Analysis and collection of data was an on-going and inherent part of the basic qualitative study and should be conducted simultaneously for the organization of

information (Bloomberg & Volpe, 2017; Lindlof & Taylor, 2017). For this basic qualitative study, the data plan's objective connect and collect data in connection with the research questions, which enhanced credibility (Stewart et al., 2017). Yin (2017) highlighted several steps for researchers to take while conducting qualitative research as follows: (a) data compilation, (b) data disassembly, (c) data reassembly, (d) data interpretation, and (e) data conclusion and meaning derived. The management plan provided critical strategies for identifying themes, trends within the data interview transcripts, and the construct of the theoretical framework. Researchers have explained that influencing the means of collection, organization, and storage of data are important considerations before one commences any data collection process (Merriam & Tisdell, 2016). It helped to save time during data management. A robust framework captured the usefulness of data collection. Such a framework helped guide future researchers interested in the body of knowledge regarding employing digital devices as instructional tools in the classroom. It also allowed me to organize raw data, categorize them, and assigned open coding to relevant quotes. I transcribed each interview immediately after it was concluded (Chase, 2017). All interviews were transcribed verbatim which helped eradicate biases associated with the phenomenon.

After transcribing all of the audio-recorded interviews and completing member checking to ensure the interpretations were accurate (Chase, 2017), I manually coded the interview on paper and entered them into Microsoft Excel software. After reading each transcribed interview, I developed a codebook that catered to identifying terminologies

and phrases that linked to the data. The coding process took several recapitulations, inductive, and a nonlinear function, which enabled the researcher to have a holistic view of the findings. After all, interviews were transliterated, I conducted an inductive approach and assigned codes to each transcribed interview. The coding helped identify and group common themes and produce rich, descriptive data analysis (Moser & Korstjens, 2018). The phrase, themes, and keywords were categorized and organized before transfer into the Microsoft Excel spreadsheet. After organizing themes, phrases, and keywords in the Microsoft Excel spreadsheet, I transferred the data into NVivo software. The process of coding data within interviews that were recorded should be isolated and decontextualized for further analysis (Creswell & Poth, 2017; McDonald et al., 2019).

Analyzing and organizing the data were done to draw conclusions and provided an in-depth understanding of Indigenous Amerindian preservice teachers methods of integrating digital technology into the curriculum. This was concluded after all the codes for each transcribed transcript was entered in the NVivo software. NVivo provided an in-depth and insightful description of how Indigenous Amerindian preservice teachers perceived the integration of digital technology into the curriculum. For verification purposes, I reviewed each code on the paper of the transcript and that of the Microsoft Excel spreadsheet. This approach provided an opportunity to note themes and patterns based on the participants' responses and identified the study's findings.

Merriam and Tisdell (2016) explained that basic qualitative analysis set procedures for identifying themes and meaning to research questions. The overarching research question in this study addressed how Indigenous Amerindian preservice teachers perceived the integration of digital technology into their pedagogical practices in the classroom. During the interview process, Indigenous Amerindian preservice teachers were asked to provide their perceptions of real situations and digital technology experiences. Indigenous Amerindian preservice teachers were given opportunities to verify the analysis of the transcriptions to eliminate any misrepresentations and clarify the given data.

As the primary instrument of this basic qualitative study, I reviewed the data multiple times for each participant, listened to the audio recording as I transcribed the interview using Microsoft Office Word and NVivo Transcriptions to organized and make sense of the data I collected. One aspect of the data analysis process is having an understanding about the treating of discrepant data. Data considered discrepant is data which does not conform to what is expected by the researcher (Merriam & Tisdell, 2016).

It is important to give an account for all discrepant data because all data collected during interviews should be transparently shared and add to the credibility of the study. Patton (2015) shares the importance of seeking alternative explanations for data collected during a study in return increasing the credibility of the study. If data is omitted from the study, the researcher would have impacted the validity and reliability of the study (Merriam & Tisdell, 2016). I reported discrepant data to increase trustworthiness along

with common themes and patterns. For this basic qualitative study, TAM and DOI's theoretical recommendations provided conceptual lenses for the interpretation of data. Such interpretation was not limited to these frameworks, but extended to the literature review andfindings of this study.

Issues of Trustworthiness

The ethical theory builds on relationships and responsibilities to ensure that I, the researcher, established validity and reliability from the choice of topic to dissemination of findings (Patton, 2015). To ensure rigor in this research, strategies such as credibility, dependability, reflectivity, transferability, and triangulation of data in a dense description of the setting were employed by the researcher to verify trustworthiness (Merriam & Tisdell, 2016; Rose, & Johnson, 2020; Thorne, 2016).

Credibility

Credibility involves the process of me using strategies such as prolonged peer debriefing and member checking in data collection (Patton, 2015). For this basic qualitative study, the first strategy of credibility was to establish research evidence representing multiple realities revealed by participants. The assurance made that adequate time was given to participants to present their experiences as accurately and genuinely as possible during the interview. I kept a constant check for patterns, themes, and repeated trends in understanding the phenomenon. Another strategy established there was truth-value (Morningstar et al., 2017; Stewart et al., 2017). As such, daily journal entries were

made. Reflective entries showed how analysis and interpretation of data was reached without influencing the fixed relationship between the participants and the researcher.

Transferability

Merriam and Tisdell (2016) defined transferability as the replicability of the study findings by a different researcher. To support other researchers in determining if this study's findings are transferable, I provided a dense description of my study (i.e., the training program) for future readers to make informed conclusions about the transferability of the findings to a particular location of context (Kim et al., 2017; Stewart et al., 2017). Participants selected for this study represented Indigenous Amerindian preservice teachers who were currently pursuing a Diploma in Teacher Education at the Professional Development Center of Education. The 45 to 60-minute interviews with the preservice teachers yielded rich data, although transferability still may not reach beyond the Professional Development Center experiences.

Stewart et al. (2017) shared a different view of ensuring trustworthiness in carrying out a study. Categorizing the strategies that lead to research trustworthiness is revealed in the following steps:

1. Report on the size of the population to be studied
2. Describe the choice of the sample size
3. Explain the research processes that are relevant to future researchers
4. Maintain openness and flexibility to standards and methods

5. Teach and encourage transparency of data reporting among Indigenous Amerindian preservice teachers

Using an interview protocol is essential to collecting relevant information from participants (Adhabi & Anozie, 2017). Following the interview protocol to keep track of uniformity of questions in the data collection process was crucial in ensuring validity.

Dependability

Dependability establishes the findings in a research study as consistent and repeatable. Mohajan (2017a) described the process whereby a reader could understand the steps in arriving at a conclusion in a study as an audit trail of a process that leads from the documentation to the raw data. An audit trail was conducted to examine the processes of data collection, data analysis, and the research study results. The audit trail endorsed the truthfulness of the findings that supported by the data collected. In this study, the audit trail was used systematically to record the information gained from the semistructured, unstructured interviews, and journal entries to minimize bias. To enhance dependability in the study, I examined all the processes adhered to in arriving at the findings and describing the processes followed in gathering data.

Confirmability

Confirmability is determined by others being able to corroborate the research findings and use auditing methods as a means of proof (Ravitch & Carl, 2016). To ensure conformability, I maintained an objective qualitative approach, used the audit trail process, codebooks derived from the conceptual framework, and kept a reflexive journal

(Bashan & Holsblat, 2017; Burroughs, 2017). A Reflective document helped with the organization and recording activities regarding personal experiences and cultural biases about the study that may arise during the interview. The reflective document also helped to maintain transparency throughout the process. To ensure the reliability and validity of data, I raised the level of awareness and acknowledged the relationship that was established between participants and their environment. As I reported the study's findings, I confirmed my findings with the interview transcripts and the data collected through the coding process to ensure confirmability.

Ethical Procedures

One of the most debatable issues in qualitative research is the protection of participants (Alase, 2017; Parkman et al., 2018). Before conducting data collection, an Institutional Review Board (IRB) requires that the investigation complies with Walden University's ethical standards and U.S. regulation. I followed ethical procedures by applying to the Institutional Review Board at Walden University (approval # is 12-11-19-0400963). The underpinning ethics in protecting participants, minimizing risk, protecting the willing or well-informed participants, and providing a fair distribution of benefits (Zarhin, 2018). To ensure participants' protection, I removed Indigenous Amerindian preservice teachers' names from the interview guides and reflective journals. Next, the Indigenous Amerindian preservice identities were not directly or indirectly disclosed. The results section does not cater to any data that required any participant to be identifiable. In place of the actual name, pseudonyms consisted of the letters IAPT followed by a

number such as IAPT 1, IAPT 2, and so on to account for all participants. Once participants felt uncomfortable during the process, they were free to withdraw their services. The study didn't dehumanize or embarrass the participants in any way. Participants were not asked to do anything unusual outside of their daily expectations. Additionally, the identity of the institution was withheld for image protection. I used pseudonyms for the training institution such as the Professional Development Center.

Participant Protection

A letter seeking cooperation was presented to the Principal of the Professional Development Center since I engaged participants on the campus. The names of participants were extracted from the Professional Development Center recruitment entry database. As the main ethical consideration process, a consent form was presented to potential participants Appendix C. In the consent form, I explained my inclusion criteria and the purpose of the study. The consent form also outlined the study's potential risks since the study does not involve the complex issue of the population. The consent form also took into consideration information pertaining to the procedure for confidentiality, data security, and privacy. Only participants who signed and returned the consent form were considered for a scheduled interview Appendix D.

Ethical protection of participants included respecting the research site for interviews, maintaining confidentiality, using ethical interview practices, sharing information with participants, and collaborating with participants (Patton, 2015). As permission was granted to engage participants, I examined the timetable and established contact hours to

present my study. The presentations were based on my study's topic to the Indigenous Amerindian preservice teachers and the sharing of e-mail addresses, telephone numbers, and Skype address for those interested in participating in the study.

To establish a working relationship, words were carefully selected to use in conversations and every participant was treated with respect (Parkman et al., 2018). Responses from participants were handled with a high degree of respect, as the careful selection of words will contribute to the study's validity. To elicit a conversational path, I produced an initial question followed by general issues that speak directly to participants. Indigenous Amerindian preservice teachers' perception and attitude about the acceptance of digital technology into the classrooms were captured through their experiences.

The result of this study will benefit Amerindian village leaders, policymakers, and other stakeholders, because it would provide insight into the adoption of digital technology by Indigenous Amerindian preservice teachers and, to a greater extent, fill the gaps in the research literature related to the integration of digital technology into the classrooms. Distributing the research findings will help the stakeholders to add a new dimension to the technological framework for Indigenous Amerindian. Participants in this study are not known to me, and my opinion will not be reflected in the interview outcome. Once participants have made contact, the researcher immediately replied to their messages by attaching a consent form to be filled and returned within two weeks of receipt before the process's commencement. Those who indicated their willingness to

share their stories were reminded about voluntary withdrawal at any time for any particular reason without penalties.

The integration of narrative inquiry in this basic qualitative paradigm helped me and the participants to interpret and determine how the actions of Indigenous teachers shaped their approaches toward the integration of digital technology. Kivunja and Kuyini, (2017) posited that narrative inquiry invokes rational ways of knowing the person's past and present. Yazan (2015) considered narrative inquiry as sequential experiences, stories that shape individuals, and their social life. The stories by Indigenous Amerindian preservice teachers shed light on the experiences used to integrate digital technology into their classrooms as maintaining confidentiality was paramount to the interviewing process. Hence, pseudonyms were used to ensure additional security in protecting their identity. All data collected was transferred to the hard drive of my password-protected computer and an external password protected, and encrypted hard drive that is only accessible to me. This data will be stored for five years, after which will be destroyed.

Summary

Chapter 3 covered the description of the basic qualitative research design by providing systemic, in-depth and conscientious approach to fact finding and data analysis (Patton, 2015).The focus of my study was to align the purpose of the research problem and questions to extrapolate rich in-depth data from the qualitative method that serves as the underpinning guide for the study. I have suggested that the main purpose of the basic qualitative study was to discover Indigenous Amerindian preservice teachers' perceptions

about the low adoption of digital technology into their classrooms. I have posited that the research design employed in the study served as a guide for the interview questions designed to extract information to answer the research questions presented. The nature of interview questions had been looked into as well as issues of trustworthiness, such as ethical procedures. The semistructured, unstructured interviews were used to collect data, which allowed for the exploration of the research questions.

This Chapter has laid the groundwork for setting up the process of data collection and analysis of responses from 10 Indigenous Amerindian preservice teachers, who work to bridge the educational gap among Indigenous students. Issues of ethical considerations, lack of bias, and security considerations were presented in detail in this Chapter. The potential risk to the Indigenous Amerindian preservice teachers was negligible and overweight by the benefits. Further, I have considered issues of credibility, trustworthiness, and dependability relating to selection and inclusion criteria, and these have been presented in a clearly outlined manner. In Chapter 4, I will present study findings that emerged from the after-data collection and analysis.

Chapter 4: Results

Introduction

The purpose of this basic qualitative study is to discover the perceptions of Indigenous Amerindians preservice teachers about digital technology integration in the classroom. To accomplish this purpose, I explored research questions which aligned with the problem and purpose of the study and a basic qualitative research design.

The research questions (RQs) for this study were:

RQ #1-What are Indigenous Amerindian preservice teachers' perceptions of the adoption of digital technology in their daily pedagogical practices?

RQ #2-What are the institutional conflicts or obstacles hindering the adoption of instructional technology by Indigenous Amerindian preservice teachers

RQ#3-What are the perceived coping and adapting mechanisms used to overcome the obstacles for the integration of digital technology by Indigenous Amerindian preservice teachers?

In this chapter, I provided the results of this basic qualitative research study. Included are the setting, demographics, data collection, data analysis, evidence of trustworthiness, the results and the summary.

Setting

The research site for this basic qualitative study was the Professional Development Center in the capital city of Guyana. This institution is equipped with resources to train both in-service and preservice teachers from all ethnic groups.

Institution factors exist as hidden variables as the participants who consented to participate in the study are from the Indigenous Amerindian ethnic group. Variables influencing the study's interpretation have included frustration about the distribution and utilization of technological resources. During the interviews, none of the participants disclosed any institutional or personal conditions that may have influenced their perceptions at the time of the study that could impact the research results. Notable as well, was that the participants remained neutral in tones as they successively responded to the questions. No interference was detected.

Demographics

The participants of this study included ten Indigenous Amerindian preservice teachers from six Amerindian Indigenous communities from the rural, remote, hinterland areas. One participant resided in Region one, two from Region two, one from Region three, three originated from Region seven, two originated from Region eight, and one participant originated from Region nine. All the participants have been classroom teachers before they embarked on formal teacher training at the Professional Development Center. Three participants taught for less than one year at a public school; three taught for one to six years before accessing training, and four others taught for more than six years before they embarked upon training. During the interview, it was revealed that six of the participants were students in their first year of training while the 4 others were in the final year of their training.

Data Collection

For this basic qualitative research study, only one source was utilized for the data collection. Ten Indigenous Amerindian preservice teachers participated in one round of semi structured face -to- face interviews conducted at the Professional Development Center. The resulting data were transcribed and coded using inductive methods (Strauss & Corbin, 1998), Rogers (2004b) DOI, and Davis's (1986) TAM four emergent themes were developed: (a) benefits, (b) barriers, (c) influence on adoption, and (d) implications. The technology acceptance model, was used to develop two emergent themes: (a) perceptions, and (b) use of technology.

Interviews

Approval to conduct this study was received from the IRB on January 7, 2020. Upon this receipt, I contacted the Chief Education Officer of the Ministry of Education (Guyana) for his permission to access the Teacher Professional Development Center. The Institution's Principal fully cooperated by allowing the researcher to conduct the face-to-face interview sessions after selecting the potential participants, based on the inclusion criteria.

Included in chapter 3 is the discussion of how the participants were recruited for this study. Access to the institution's spreadsheet database was used to identify potential participants based on their ethnicity. The recruitment of participants took place between the latter part of January, 2020 and the middle of February 2020. All interviews were audio-recorded using transcription software on a Samsung

smartphone and a laptop computer. An individual voice template was used to record the interview, which was labeled with the emergent pseudonym generated for this study (which are IAPT 1-10 for Indigenous Amerindian preservice teachers). The audio recordings were downloaded from the smartphone to transcriptions software. These were saved to a secure, encrypted, and password-protected external hard drive and a google cloud account and then deleted from the smartphone device. All interviews at the institution were conducted in the space of the participant's choice after 3:00 pm UTC-4, as shown in Table3.

Table 3:

Procedure for Conducting Interviews

Teacher's Code	Date	Time	Duration
IAPT1	01/23/20	3:00 pm- 3:55 pm	55 mins.
IAPT2	01/27/20	5:00 pm- 5:50 pm	50 mins.
IAPT 3	01/29/20	3:35pm- 4:20 pm	45 mins
IAPT4	01/31/20	5:00 pm- 5:48 pm	48 mins.
IAPT5	02/03/20	4:00pm - 4:47 pm	47 mins
IAPT6	02/04/20	5:00 pm- 5:47 pm	47 mins
IAPT7	02/06/20	3:00 pm- 3:49 pm	49 mins
IAPT8	02/07/20	5:00 pm- 5:46 pm	46 mins
IAPT9	02/12/20	3:30 pm- 4:10 pm	40 mins
IAPT 10	02/14/20	4:00 pm- 4:37 pm	37 mins

Note: Table depicts the duration, commencement and conclusion of interviews with participants. The process started on January 23rd 2020 and concluded on February 14th 2020.

After the completion of the interviews, the data were prepared and analyzed. First, the smartphone was used to make written transcriptions from the audio recording. The transcription was reviewed for accuracy by comparing the audio to the written transcripts. The text was updated due to inaccuracies, added punctuation, and masked information revealing the institution's name. Transcripts were sent to participants for them to review the same for accuracy, as described in Chapter 3. Next, the Word documents were uploaded to NVivo, and subsequently each document was coded by hand. Lettered pseudonyms were assigned to protect for each participant.

Data Analysis

For this basic qualitative study, I conducted data analysis using three steps. I used inductive analysis, which Dreamson et al., 2016 recommended for qualitative research.

To help in this process, I have developed categories into a model using Rogers (Rogers, 1995a) diffusion of innovation theory and the second using Venkatesh and Davis (2000) Technology of acceptance model. I focused on identifying emergent patterns to determine the emergent themes, as highlighted by Saldaña (2016).

Step 1 Data Analysis

For step 1, which dealt with data analysis based on my conceptual framework, I used one codebook during the coding process. I adopted the strategy of inductive analysis and then uploaded all transcripts to NVivo. I used the framework of the DOI and the TAM. This strategy has five steps: initial reading of transcripts, identification of specific text segments related to the objectives, labeling the segments of the text to create categories, reducing overlap and redundancy among the categories, creating a model to incorporate most important categories as suggested by Merriam and Tisdell (2016). Subthemes were identified after several times of reading each transcript.

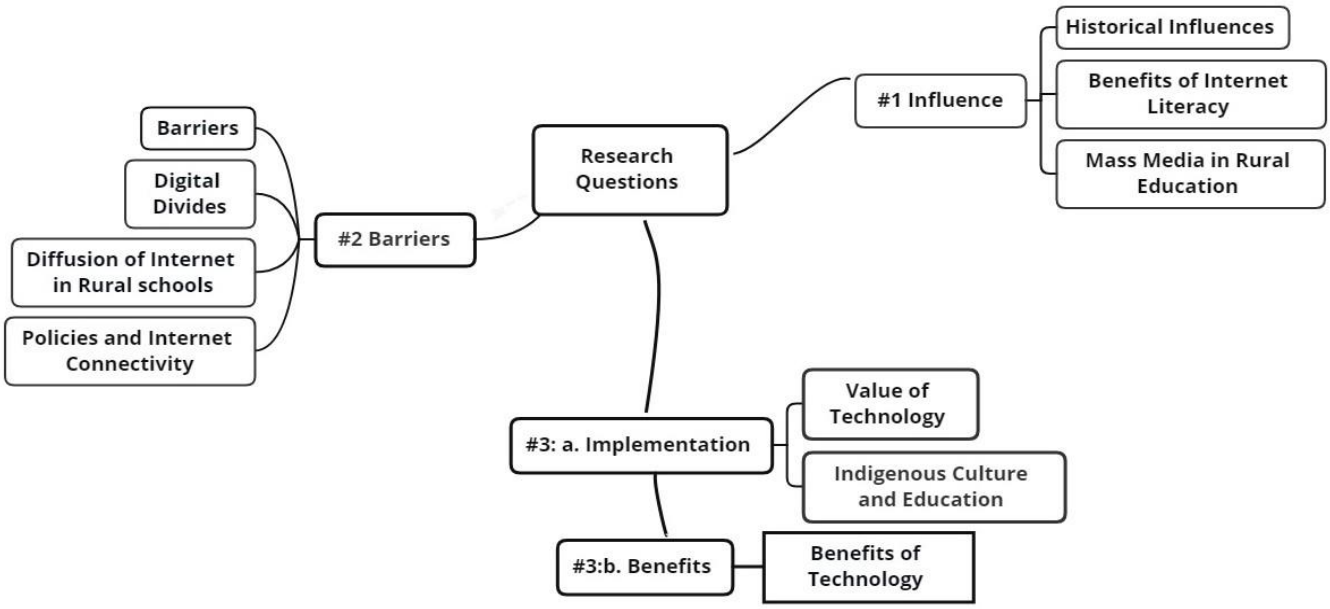
As I continued to read each transcript, I checked my codebook to ensure that I had assigned the proper emergent themes to the text excerpts. Then I adjusted the codebook as needed when I gained clarity about the particular code Appendix A. I considered possible meanings that fitted into emergent themes. The transcripts were read horizontally, and segments of text were grouped. Themes were named in three ways: words from participants, literature concepts, and the framework. Based on the emergent themes, each interview question (IQ) was placed in the category (1: Benefits, 2: Barriers, 3: Influence on Adoption, 4: implementation). I used NVivo to complete the initial

coding. The emergent themes text was assigned to free nodes in a disordered arrangement.

After the process was concluded, I stripped and reunited the emergent themes using xMind mind mapping software that visualized additional patterns and meaning in the data. The emergent codes that emerged from the data aligned with the study's conceptual framework and research questions. I grouped these themes to identify emergent emergent themes and aligned with RQ 1, RQ 2, and RQ 3 as shown in Figure 3

Figure 3:

Emergent Codes Aligned to Research Questions1, 2, & 3



Note: This figure demonstrates the alignment of literature review and RQ 1-What are Indigenous Amerindians preservice teachers' perceptions of the adoption of digital technology in their daily pedagogical practices?, RQ 2-What are the perceived barriers to the adoption of digital technology by Indigenous Amerindians preservice teachers? and RQ

3 -What are the perceived coping and adapting mechanisms used to overcome the barriers to the integration of digital technology by Indigenous Amerindians preservice teachers? in relation to the adoption of digital technology within the curriculum.

Although the themes that emerged aligned with the conceptual framework, the flexible approach to analysis that I took allowed me to recognize that others more strongly emphasized some scopes of the participants. I designed a table using Microsoft Excel, where I grouped the interview questions by relevance to each of the three research questions. The text of each participant's responses was color-coded line by line and grouped under each interview question, as I carefully listened to the recording. I highlighted the provisional emergent themes line by line or by long phrases, numbered the frequencies of words as I transcribed the interviews. The categorizing process was repeated in Microsoft Excel and transferred into (NVivo version 12) and into xMind. In Microsoft excel, I followed along on the excel document of the transcripts line by line, typed an emergent theme when possible, and generated provisional coding if a priori emergent themes did not accurately capture the responses.

The data was transferred into NVivo (version 12). I created a word tree to explain emergent themes in the xMind software. This provided a visual picture of viewpoints that emerged from the research questions. I highlighted and stored meaningful routes as nodes in NVivo before creating the word-tree matrices and further condensing themes and subthemes within the data collected. Once I began coding, the process was not direct. I adopted a descriptive coding strategy to give meanings to raw data segments in such a

way to use emergent words and phrases for categorization and thematic analysis (Saldaña, 2016). This process of examining and providing the meaning of the perception of Indigenous Amerindian preservice teachers about the adoption of digital technology was done by creating a theme (Vaismoradi et al., 2016). The raw data obtained from the transcripts (collected from the interviews) contained all 10 participants' experiences.

After I completed the interviews, I printed a hard copy of the table I created in Microsoft Word, a document with all the participants' responses. I color-coded the interview data after reading the transcripts several times to identify emergent themes, frequency of words as they related to Indigenous Amerindian preservice teachers' perspectives on the integration of digital technology into the classroom. I then reviewed the analysis multiple times for each transcript, and the researcher's journal notes to verify the content. This method created a transparent atmosphere for the researcher to interpret and analyze it (Maguire & Delahunt, 2017).

I highlighted the emergent themes and transferred each code for each research question onto index cards. The index cards were grouped in the same manner as the table I created. I analyzed and sorted emergent themes along with comments made by participants during the interviews. I used axial coding to code the data. This strategy allowed me to visualize patterns in the data, as I was able to physically layout the data and make connections and relationships among the emergent themes. I quantified the emergent themes that were applied to the responses for each interview.

Step 2: Interview Coding and Connecting Data

This basic qualitative study included 10 participants whose responses were coded in the order by which they were interviewed IAPT 1, IAPT 2, through to IAPT 10. Participants were exposed to semistructured and unstructured interview questions that allowed them to provide in-depth responses to the questions. After face-to-face interview recordings were transcribed, they were examined for pertinent concepts, themes, and subthemes. By hand-coding, each transcript, several themes, and patterns were discovered. During the data analysis, I embarked upon intensive reading and re-reading of data as I tried to identify respective themes. As the themes emerged, they were aligned to research questions. Several themes were similar to findings in some studies included in the literature review. Analysis of the responses resulted in 21 themes, and four were merged, which resulted in 17 themes. Twenty-one themes emerged from the data, as shown in (Table 3), and arranged into four categories, which are (a) benefits, (b) barriers, (c) influence on adoption, and (d) implementation, as shown in (Table 4).

Table 4

Emergent Subthemes Aligned to all Interview Questions.

No.	Subthemes	IAPT 1	IAPT 2	IAPT 3	IAPT 4	IAPT 5	IAPT 6	IAPT 7	IAPT 8	IAPT 9	IAPT 10
1	Heavy workload	*	*	*	*	*		*	*	*	*
2	Digital technology is useful	*	*		*	*	*	*		*	*
3	Digital technology supports preservice teachers	*			*	*	*	*			*
4	Digital technology is difficult	*	*		*	*	*	*	*	*	*
5	Digital technology makes preparing lesson plans easier	*	*	*	*		*		*		*
6	Not sufficient exposure to digital technology	*	*	*	*	*	*	*	*	*	*
7	Some lectures are more susceptible to our plight		*	*	*		*	*	*	*	*
8	No previous knowledge of digital technology		*	*		*	*	*	*	*	*
9	Technology is a motivation learning tool	*	*	*	*	*	*	*	*	*	*
10	Can be a distractor to students and peers		*	*	*	*		*	*	*	
11	Peers are more knowledgeable than us	*	*	*		*	*	*	*		*
12	Basic knowledge of operating a computer is missing		*	*	*	*	*	*		*	*
13	Having resources without skills	*	*	*	*	*	*	*	*	*	*
14	System is considered a gigantic barrier	*	*	*	*	*	*	*	*	*	*
15	I am a potential adopter	*	*	*	*	*	*	*	*	*	*
16	Exposure to abstract teaching is not preparing us for active learning			*	*	*	*	*		*	*
17	Contents are not aligned to our lives	*	*	*	*	*	*	*	*	*	*
18	Language is not pure English			*	*	*		*	*	*	*
19	Poor quality of teaching	*	*		*		*	*	*	*	*
20	Ongoing professional development	*	*	*	*	*	*	*	*	*	*
21	Create a working technology plan through collaboration and communication	*	*	*	*	*	*	*	*	*	*

Note: Extracts of Indigenous Amerindian preservice teachers' perception about the low adoption of digital technology**.**

Table 5:

Emergent Themes and Categories for the Adoption of Digital Technology

Benefits	Barriers	Influence on adoption	Implementation
Digital technology supports the planning of lessons	No technical support is a barrier Lack of communication and sharing of information	Peers are more knowledgeable	Indigenous Amerindian preservice teachers should be asked for input into the execution of curriculum while training.
Provides access to online resources and research materials for individual studies	Limited internet access No previous knowledge in the area of digital technology	Digital technology especially the smart phones are used more in personal activities.	A one size fit all approach would not work for the teachers. Continuous professional development for the Indigenous Amerindian teachers
Digital technology motivates learners	Some administrators and lecturers are blunt to assist with initial use of digital technology	Have a curious mindset. Constantly exploring the apps on Smart phones. Trying to master the basic skills would influence the adoption of digital technology	
Helps in creating worksheets Digital technology creates alternative in class activities	Time spent to complete document on computer, Frequent power outage Intimidated if system is damage		

Note: This table demonstrates the alignment of emergent themes to research questions. Overlapped themes are group in under the heading: benefits, barriers, influences on adoption and implementation

The participants provided their descriptive responses to the questions during the face-to-face interviews. After the interviews, I placed my research questions, framework, and the purpose of my study to satisfy the coding process. They were placed in front of me while I scrutinized each manuscript for themes. A professional transcriber 'dragon anywhere', subsequently transcribed the audio-recorded responses into Word documents, and the coding continued. Once converted, and with the use of the Microsoft highlighter, I manually color-coded the Microsoft Excel data, which resulted in the grouping of themes into four categories, as shown in Table 5 , and then I aligned the themes to research questions as shown in Table 6.

The participants discussed their influence, barriers, benefits and implementation, and ways they can adopt digital technology. While the purpose of this study is to discover the perceptions of the teachers about the integration of digital technology, the re-emergence of barriers such as communication at the institution did present obstructions at the beginning of the data collection process. Those barriers were overcome before the conclusion of the data collection process. The following themes and subthemes were identified for each research question (as seen in Tables 6, 7, 8 and 9), and the data analysis is addressed in depth in the results section.

Table 6:

Research Question 1 with Emergent Themes and Subthemes

Approach of lecturers	Perceptions	Skills and knowledge	Adopters of digital technology
Collaboration: - Student - instructions - professional growth	Lack of Knowledge: - readiness - shared experiences - remote communities: i. accessibility ii. support iii. multi-grade teaching	Resources: - finance - computer - smartphone	Enhanced teaching: - support - networking
Curriculum delivery: - instructional tools - observational skills	Pedagogical organization - merging existing content - provide rich information	Techniques: - manage technology tools - installation of devices	Teaching tool: - software - hardware
New strategies: - technology - integrated approach - student centered		Technological skills: - typing - research - assorting materials Motivated: - language - demographic	Multiple skills: - downloading of materials - creating video with local content

Note: RQ 1:What are Indigenous Amerindians preservice teachers' perceptions of the adoption

of digital technology in their daily pedagogical practices?. The analysis of research question one

Table 7:

Emergent Themes and Subthemes for Research Question 2. (a):

Digital technology	Insufficient exposure to technology	No previous knowledge	Quality of teaching
Setting up teaching tools -time consuming -learning new language -have no starting point - technological intimidation	Demographic i. remote communities ii. lacks infrastructure Secondary education . communication i. unfamiliar content	-ability to integrate digital technology - trial and error - stimulant for digital technology	- content delivery - traditional method - unilateral approach

Note: What are the perceived barriers to the adoption of digital technology by Indigenous Amerindians preservice teachers?

Table 8*:*

Emergent Themes and Subthemes for Research Question 2(b):

Alignment of Content with way of life	Basic Knowledge	Gigantic Barriers
- connecting to communities - enhanced learning - first-hand information - equal opportunities	- effective integration of tools - uploaded of data - technology commands	Administration; - internal i. college focus ii. policies iii. poor communication infrastructure i. electricity ii. WiFi password iii. internet connectivity Peers strengths work ethics Ministry of Education technological plan absence of technological resources Individual culture age level of education experience

Note: This table demonstrates the elements of interview and research questions. What are the perceived barriers to the adoption of digital technology by Indigenous Amerindians preservice teachers?

Table 9:

Creating working technology plan	Ongoing professional development	Teaching preparation	Motivational tools
- Plan aligned with Indigenous beliefs and practices - Step by step handbook - Technology orientation plan	- Appropriate technological skills - How to adjust their lifestyle - Changing the landscape of multi-grade classroom	- Video creation - Presentation software - Demands per level - Daily activities	- Adjustment of teaching for individual ethnic groups - Sustainable technology program - Content of curriculum - Community technology tool

Emergent Themes and Subthemes for Research Question 3.

*Note***:** This table demonstrates the analysis of RQ 3- What are the perceived coping and adapting mechanisms used to overcome the obstacles for the integration of digital technology by Indigenous Amerindian preservice teachers?

This present study on the adoption of digital technology by Indigenous Amerindian preservice teachers in classrooms was guided by three research questions. These are:

(1) What are Indigenous Amerindian preservice teachers' perceptions of the adoption of digital technology in their daily pedagogical practices?

(2) What are the perceived barriers to the adoption of digital technology by Indigenous Amerindian preservice teachers?

(3) What is the perceived coping and adapting mechanisms used to overcome the barriers to integration of digital technology by Indigenous Amerindian preservice teachers?

This section would be organized by the research questions and interview questions.

Discrepant Cases

Although the themes that emerged aligned with the conceptual framework, the flexible approach to analysis that I took allowed me to recognize that some dimensions of IAPTs perceptions were more strongly highlighted than others, and this provided opportunities for IAPTs to become adopters. emergent patterns and sub-theme of coded data in the alignment process reflected new perspectives of IAPTs. Within some themes, participants shared discrepant viewpoints. For this study, as recommended by Patton (2015), I shared all discrepant data under a separate heading in the results sections. The data did not conform to the inclusion criteria for any of the codes examined for research questions 1, 2, and 3. In these instances, differing views were grouped under the same codes and sub-codes, but the codes were named using neutral language that incorporated all viewpoints.

Evidence of Trustworthiness

I upheld issues of trustworthiness in several ways. This section described how I ensured credibility, transferability, dependability, and confirmability throughout the research process.

Credibility

For qualitative research, Merriam and Tisdell (2016) characterize credibility as an association between the "research and reality" (p.242). As recommended, qualitative researchers suggested to utilize triangulation, member checking, satisfactory engagement in data collection, peer review, and discrepant case investigation the credibility of the data collection. As shown in Chapter 3, the credibility of my study was kept up all through the study by recognizing and depicting the participants accurately Connelly

(2016). To avoid misinterpretations of the meaning of data shared amid the interviews, a technique called member checking (see Merriam & Tisdell, 2016) was utilized. After each interview was transcribed, I sent transcripts to each participant to review the data based on the interviews they shared with me. Participants checked and affirmed that the transcriptions reflected their perspectives while partaking in the face-to-face interview. The researcher entered journal notes throughout each interview session. An appraisal of the researcher's journal notes helped control the researcher's predisposition all through the study.

Transferability

Merriam and Tisdell (2016) characterized Transferability as the replicability of the discoveries by a diverse researcher. To support other researchers in deciding if the discoveries of, this study are transferable in my study on the low adoption of digital technology among Indigenous Amerindian preservice teachers while participating in teacher education training program in Guyana. I provided common descriptions about the participants' gender, years of experiences, demographics, and courses held with digital technology during the two years. Participants were purposely selected from the preservice teachers' training program for my study. I assembled all data about the participant's demographic shared by the institution's spreadsheet database. This process was done to ensure the foundation of external validity and transferability.

Dependability

Ravitch and Carl (2016) described dependability as the consistency of information while answering research questions. A strategy for ensuring the dependability and validity of the discoveries incorporates the explanation and rationale for the research

methodology and consistently with participants across different settings. In this study, I followed the recruitment protocol discussed in Chapter 3 by using the inclusion criteria to ensure all participants met the requirements before participating in the interviews. As my participants were from diverse Regions of Guyana, I followed my methodology with participants across these various settings to increase my study's dependability. Once data were collected, I intentionally displayed findings consistent with the data gathered during interviews (see Merriam & Tisdell, 2016). For example, I utilized emergent themes aligned with my conceptual frameworks to tell the story of my participants' interview data. As Merriam and Tisdell (2016) suggested, the alignment of the collected data and the presented findings support the dependability of my study.

Confirmability

Ravitch and Carl (2016) describe confirmability as the equivalent of objectivity. Confirmability requires that a qualitative researcher recognizes zones of predispositions; in any case, one does so with the information that one cannot be completely objective amid the investigated manner (Ravitch & Carl, 2016). In this study, I applied reflexivity at some stage in the research procedure. I deliberately used the coding system to make sure of confirmability in my study. Throughout each interview, I was objective, thereby providing relevance, meaning, and accuracy of the data as conducted by Roller (2019). I affirmed all discoveries with interview transcriptions to ensure dependability and confirmability. In expansion, I utilized my reflective journal to provide a critical analysis as I reviewed, coded, wrote about the interview data, and utilized the journal to document where I was in the process to establish the correctness of the data and provide further transparency about my process.

Results

The interview questions' responses juxtaposed with the research are organized to reflect the results of this qualitative research and discussed in this section of the Chapter. Under each question, participants' responses were originally organized in transcripts according to the order of questions in the interview guide. Emergent themes represented participants' responses according to the conceptual framework for their inclusion facilitated my understanding of the patterns and connotations that emerged.

Research Question 1

The first Research Question was: What are Indigenous Amerindian preservice teachers' perceptions of the adoption of digital technology in their daily pedagogical practices? I coded 52 text segments for Research Question 1. Participants were asked to reflect on their perception of digital technology. There were four themes that emerged during the semi structured interview: perceptions, skills and knowledge, adopter to technology, and approach to lecturers The frequency of responses for each theme for this Research Question 1 is shown in Table 10.

Table 10:

Frequency of Emergent Codes for Each IAPT.

Teachers Code	Perceptions	Skill and Knowledge	Adopters to Technology	Approach of Lecturers	
IAPT1	2	1	3	0	
IAPT2	1	1	2	1	
IAPT 3	2	2	1	0	
IAPT4	1	1	1	1	
IAPT5	2	1	2	0	
IAPT6	1	1	3	2	
IAPT7	3	1	1	1	
IAPT8	1	1	2	1	
IAPT9	1	2	1	0	
IAPT 10	1	1	1	2	
Total	15	13	16	8	Total 52
	(28.8%)	(25.0%)	(30.7%)	(15.3)	100%

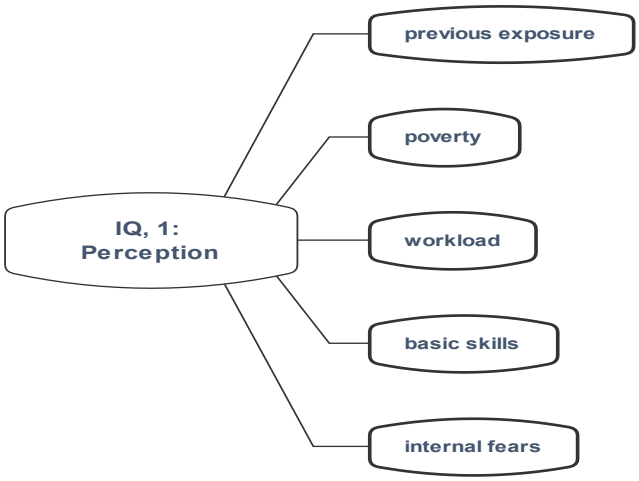
Note: The table demonstrates the alignment of research questions, and individual teachers' perceptions about the integration of digital technology. Diffusion of innovation theory and the TAM for RQ1and interview questions 4.

Theme 1: Factors that impinged on Indigenous Amerindian preservice to adopt digital technology into the classroom. In this section, I tried to understand the indigenous Amerindian preservice teachers' perceptions of digital technology adoption. The figures in this section show the emergent code and sub-codes that were inductively generated from the interviews

Emergent Code1: Perception. All of the participants explained their perceptions about adopting digital technology in response to interview questions (IQ)-1, 15 text segments with code perception were coded. All of the segments that were coded aligned with the conceptual framework. The code was found across all 10 participants (Figure 4).

Figure 4.

Emergent Code and Sub code Aligned to RQ 1and IQ 1



Note: The figure demonstrates the perceptions of IAPTs related to RQ 1- What are Indigenous Amerindian preservice teachers' perceptions adoption of digital technology in their daily pedagogical practices?

Perception was the second most represented theme (15/52, text segments, 28.8%) and was represented by all 10 participants interviewed. In their interviews, participants felt the adoption of digital technology is meaningful once their Perception can be taken into consideration. Each will be discussed in a separate paragraph. Participants were very vocal and felt that digital technology adoption could be meaningful based on their holistic perception. IAPT 3 described how her Perception of digital technology is based on previous exposure while at the secondary school and now at the training college. She emphasized that it is "tough to adjust to digital technology."

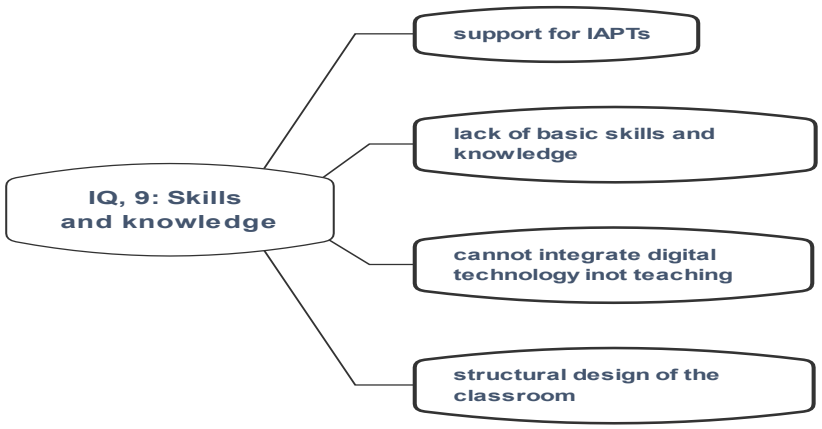
Additionally, she shared her openness to digital technology based on her environment where "one computer was placed at the school, and students were not privileged to touch it." At the Professional Development Center, she has developed "internal fears of touching the system because of its fragility." Such statements were echoed by all the participants with some degree of variations, as shown in Figure 4. Four Indigenous Amerindian preservice teachers, IAPT 1, 7, 8, and 9, used terms like "they are too poor to replace a computer," and the remaining five Indigenous Amerindian teachers placed emphasis on their "workload."

Eight of the 10 Indigenous Amerindian preservice teachers' IAPT 1, 2, 3, 4, 5, 6, 8, and 10 shared their opinion about the importance of conducting a technology course for novice Indigenous Amerindian preservice teachers since "technology does play a major role in their training. There is the need to equip teachers with digital technology skills, reshape the education system, expand social interaction, and create learning networks." IAPT 7 acknowledged that "Indigenous Amerindian preservice teachers have many weaknesses and should be taught the basic skills about using digital technology at the government's expense. She added: "I feel violated, hmmm…". IAPT 9 shared that all Indigenous Amerindian preservice teachers need to be on the same developmental level as their colleagues, so they can feel "included in the technological drive, especially in becoming competent educators." However, she did mention that new teaching tools may enhance the pedagogical process". She still looks for ways that the institution can use to capture all Indigenous Amerindian teachers.

Emergent-Code 2: Skills and Knowledge. Thirteen text segments with code skills and knowledge were coded. The emergent theme and sub-codes were found across all 10 participants (Figure 5).

Figure 5:

Emergent Code and Sub Codes Aligned to RQ 1 and IQ 9.



Note: The figure demonstrates the skills and knowledge of IAPTs connected to RQ 1- What are Indigenous Amerindian preservice teachers' perceptions adoption of digital technology in their daily pedagogical practices?

The emergent pattern occurred within 25.0% (13/52), of the text segments, shared during IQ 9: "what skills and knowledge do you lack that might be affecting your use of digital technology?" One hundred percent of the participants shared that the necessary skills and knowledge were lacking. When asked to speak about the skills and knowledge needed, IAPT 1 shared, "skills! -technology skills are alien to me; I have none, no not one, neither knowledge period -I mean none whatsoever about the use of digital technology". In

addition, to the teacher's exclamation about the absence of technological skills, the teacher shared credible ways to integrate new teaching tools to understand the appropriate techniques and steps associated with the process of using technology. All Indigenous Amerindian preservice teachers commented on the classrooms' structural design, which calls for multiple skills such as "turning on and off of devices, understanding the keys on the system, connecting a projector, exploring Microsoft and finding valuable information on line. " IAPT 2, online, described their exposure to using digital technology. IAPT 2 said, "I wish if more time was allotted to us." IAPT 3 shared, "it is funny how trial and error applied at the institution.

Additionally, IAPT 2 and 5 shared, "knowing the device is good, but how to integrate it into the lessons is another thing." For instance, explains IAPT 9, making and downloading of videos as a teaching tool is far from reality. She shared that her phone is being used to receive and send calls, but not to make any videos. Similarly, IAPT 2 shared how dumb it feels, "that shucks man." I feel like a modern-day prisoner with no skill to compete in this technological saga. IAPT 10 said, "I honestly, based on the exposure given to preservice teachers, I have no patience to learn technological skills; IAPT 5 agreed with the view.

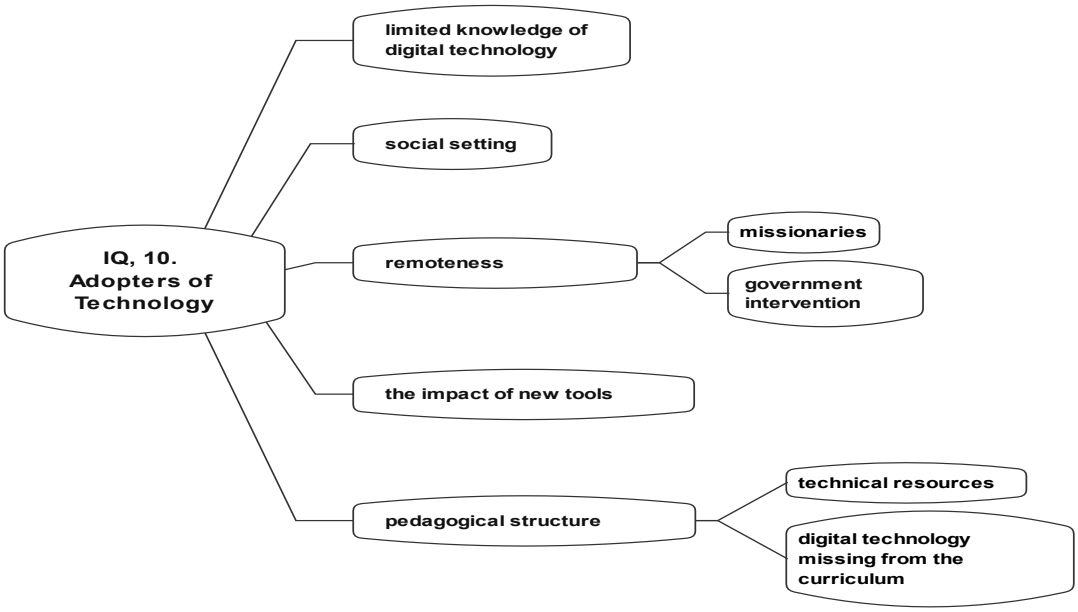
Similarly, IAPT 6 shared that lack of knowledge surrounding technology use to enhance their creativity, collaborating with other educators, and motivating learners to connect with their counterparts is grossly lacking. IAPT 6 indicated that the lack of knowledge about the use of Google apps, Microsoft tools, or any other technology that may help organize and keep learners on track is evident. IAPT 6 also recalled that they

were never exposed to acquiring the knowledge and skills of readiness to merge existing content, connecting them to other subjects with rich information, and maintaining the structure; hence it is lacking.

Emergent Code 3: Adopters of Technology.Sixteen text segments with code adopters of the technology were coded. The emergent theme and sub codes were found across all ten participants (Figure 6).

Figure 6:

Emergent Code and Sub Codes Aligned to RQ 1and IQ 10



Note: This figure demonstrates the pattern of Indigenous Amerindian focus on the adoption of technology. RQ 1- What are Indigenous Amerindian preservice teachers' perceptions adoption of digital technology in their daily pedagogical practices?

The emergent pattern occurred within 30.7% (16/52) of text segments, shared during IQ 10 that sought to determine the rate of adoption of participants towards the use of digital technology as a teaching tool. Seven of the participants described the initial reaction as scary through the Indigenous Amerindian' lens, since they have limited knowledge about technology and how to use it as a teaching tool. For instance, IAPT 3, 5 and 9 described limited knowledge of the term 'digital technology' because of how they were asked. They are reluctant even to try all these new gadgets. IAPT 3 said, "digital technology seems more remote to me" because of a lack of understanding. IAPT 5 pointed out that digital technology is not a part of their lives and was never used before. IAPT 9 feels confused and refused to buy into this digital technology. She indicated the applicability of technology is better on the coastland, where resources' availability is paramount. IAPT 1, 2, and 10 described their reaction based on "lack of knowledge and experiences." The teachers are of the view that is living in a world where digital technology is taking precedence over daily activities combined with their lack of knowledge or skills has caused them to distance themselves from changes. IAPT 1 alluded to the fact that "remoteness has caused him not to show interest in technology." Similarly, IAPT 2 and 10 described their initial reaction by saying, "accessibility to Indigenous communities has always stymied educational growth and the enhancement of new knowledge." IAPT 10 added, "this is as real as it can be." Similarly, IAPT 8 appreciated that new ways for curriculum delivery are vital, even though she is not comfortable with the tools.

The participants also noted that digital technology would affect their way of life within the villages and lose everything. Besides, IAPT 4 and 6 separately believed that

remote communities need to be exposed to new teaching methods and materials, so equality in education can become meaningful. The learners can become true competitors in this modern world. IAPT 4 shared his view about the integration of digital technology as a new teaching tool. This participant is enthusiastic to try any new and innovative ways of teaching. It would 'Wow' the curiosity of Indigenous learners in the remote communities. Participant IAPT 4 went even further by saying, "as teachers in training, we should all be involved in the technological drive to better function in the classroom. I am not feeling it because no structure is in place for us to receive it and function as a unified learning body". IAPT 6 believed that 'trial and error' can be the key to a nation striving to ensure all teachers receive the necessary experiences. IAPT 6 shared, "I felt compelled to stand my position" since I'm always excited to try new strategies for the advancement of learning." He further described valuable digital technology characteristics to the teaching sector, such as "making preparation lighter, adding more learning materials towards creating child-centered classrooms or satisfying the Ministry of Education's mandate of interactive classroom learning."

Additionally, IAPT 7 shared how multiple learning strategies from others is vital to boost one's interest in using digital technology. IAPT 7 believed that the perception surrounding digital technology is "neither hot nor cold" but acknowledged the value of technology towards learning. She expressed her position based on the locations of Indigenous communities in Guyana. She described her reactions based on her impassiveness towards digital technology," when I returned into my community; this training would become obsolete, have no room to grow technologically." Digital technology for her is like "a boat"; if no boat, then one cannot move, unlike persons on

the coastland who have choices, so it is easier for them to switch from "chalk and talk to digital technology." IAPT 1 noted, "I feel that if there are different approaches towards using digital technology, then I can embrace it." There are lots of Indigenous Amerindian preservice teachers who are willing to use this digital technology but are scared due to a lack of support, technical resources, and knowledgeable individuals within the regions. This is also noted in other comments by participants IAPT 2, "we need more expertise in our region who can teach Indigenous Amerindian the skills necessary to use digital within the classrooms. As teachers, we need to be sure of our task, and this includes the setting up and sustaining the use of digital tools to promote learning.

Additionally, participant IAPT 9 commented that the curriculum is so structured that there is little or no room for flexibility, so teachers cannot be the lone soldiers to integrate technology. In my opinion, the integration of digital technology can only be possible if the designers of the curriculum restructure the curriculum and ensure that all planned lessons capture aspects of digital technology and align them to the educational standards. This notion of lesson planning was also reflected by IAPT 7, "I see the planning of course subjects by levels would help to facilitate the integration process of digital at the different levels. That would help me to be less nervous and be more optimistic about the process. In my view, once the structure of lesson planning has an all-inclusive framework, then all would have to use aspects of digital technology regardless of location. IAPT 10 reflected on the location of her region. She expressed her feelings as: "left out due to remoteness of her community within the hinterland region." Even if there are resource personnel in the region, they don't come to my area. In my community, we are close but yet far away from civilization. She was able to make connections to their

current education pattern and missionaries' role in the communities to expose the residents to "Western things." In conjunction with the Ministry of Education, the role of missionaries, can enhance the fabric of education within Indigenous communities. This is also noted in other comments from IAPT 3. The teachers believed that "if the government tries to understand our plight, then they would ensure that more locals rained as technical assistants for the teachers." "Indigenous Amerindian are really at a loss when it comes to technology, and this brings on the frustration that affects our ability to embrace digital technology effectively."

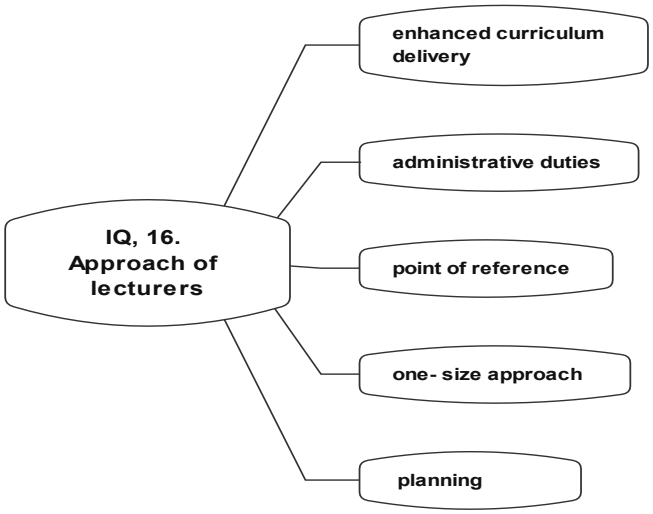
Similarly, IAPT 5 shared that "limited economic activities and the structure of the communities has drastically impacted the way digital technology is accepted. So, the knowledge I gain from this Professional Development Center would not persuade me more to accept digital technology as a teaching tool. I can't immediately transfer this knowledge into the classrooms." She further mentioned that the absence of infrastructure and the arrangement for changes lack the integration of digital technology. "I want to know 'which sane thinking citizen would venture out in unchartered waters and know it is not possible?' Well, I'm not in that bracket." Additionally, IAPT 8 commented, "as a teacher in training, I'm making an observation of the way things are done, and it's not helping me to make rational decisions about the use of digital technology." "Much has not been done to help us - the Indigenous Amerindian preservice teachers to be more involved with all aspects of trending technological devices that would help us to have a different outlook towards the diffusion of innovation." IAPT 4 and 6 indicated their willingness to change their thinking for the best. Participant IAPT 4 noted that no external force is needed for him to explore the technological world. "I am a self-

motivator and have always challenged myself to do better. So, if the training college is prepared or not, I'm ready to explore new teaching tools". This was echoed by IAPT 6, who feels that self-motivation is the key to making a teacher become a change agent in education delivery. For this reason, IAPT 4 has an open mind toward innovation."

***Emergent Code 4: Approach of Lectures*.** Eight text segments with code approach of lecturers were coded. The emergent themes and sub codes were found across all ten participants (Figure 7).

Figure 7:

Interview Question 16 Aligned to Emergent Themes and Subthemes for RQ1



Note: This figure demonstrates the elements associated with the IQ 16 and RQ 1- What are Indigenous Amerindian preservice teachers' perceptions adoption of digital technology in their daily pedagogical practices?

The emergent pattern occurred within 15.3% (8/52) of the text segments, shared during IQ 16 that sought to find out lecturers use digital technology towards

training. Eight of the 10 Indigenous Amerindian preservice teachers shared that many lecturers used technological methods to deliver the curriculum and perform their administrative duties. IAPT 1 and IAPT 7 shared similar thoughts about lecturers' approaches towards technology integration. Technology is used in classrooms to strengthen classroom management. IAPT 7 described the instructors as "information providers" by producing handouts, reading materials, and course grades on the computer.

Additionally, IAPT 1 shared how some instructors would find some "unusual material" and add the same to a list of reading materials to access with ease. IAPT 2 mentioned that her psychology, science methods, and lesson planning lecturers directly take learning resources from specific websites. Concerning learning resources, IAPT 1 "feels helpless and overwhelmed" in all the classes. Two respondents – IAPT 3 and 5 mentioned the use of the software by lecturers to produce multiple learning materials in Math and Language. IAPT 9 further indicated that the lecturers would use technology as their point of reference during teaching. "In my Home Economics program, my lecturer would use the internet as a stimulant. We would watch cooking videos for all ages, create recipes, and devise a plan for the next session. It just takes time to create a menu because most of the ingredients I'm not familiar with".

Similarly, IAPT 4 described digital technology as a "promotional tool" in the Physical Education program. The instructors continuously use different forms of technology to showcase techniques and skills synonymous with training. He also found it interesting that he has to use a projector to display websites because of the size of the class.

Additionally, IAPT 4 described the "administrative approach of using technology for in-class registration, send the notification, and assessment." IAPT 6 reported that digital technology is used by the Methods lecturers to construct lesson plans, examine universal lesson plan templates, and engaged learners in developing a unique teaching framework.

For example, the Language Methods lecture would come with an idea, group students, and request for us to use "Finland's lesson plan" to create a meaningful learning environment. IAPT 6 is of the view that her lecturer's approach is helping the vulnerable preservice teachers to use the technology, but she is fearful. "I would allow others to go online with their technological device and I would be the scribe for the group, because English is my second language, and my self-confidence is lacking, but the lecturer would encourage students to store and save all data in the cloud or on flash drives before sharing of information . Three participants IAPT 5, 8, and 10, described the multiple approaches the lecturers would take to impart knowledge. IAPT 10 reported that lecturers have a dual approach to the use of technology in the classroom. They would still maintain the "traditional method coupled with new technology approach." IAPT 8 shared the approach the Visual Arts lecturers embraced to ensure duel methods are used. For example, "projected and non- projected visuals" are used to demonstrate visual principles within the Art program.

Similarly, IAPT 10 described the duel approaches, where non-projected visuals, such as "cinematograph, diorama, flow charts or posters were created" as teaching materials. But digital technology would have to be used to support the presentation. All participants indicated that the dual approach highly encourages, engages, and motivates

Indigenous Amerindian preservice teachers. Regardless of how digital technology is being used at the college, the participants feel that the tools can help them to be better teachers.

Research Question 2

The second Research Question was: "What are the perceived barriers to the adoption of digital technology by Indigenous Amerindian preservice teachers? I coded 124 text segments for Research Question 2. Participants were asked to reflect on perceived barriers to adopting digital technology. Nine themes emerged during the semistructured interview: previous knowledge, basic knowledge, individual barriers, quality of teaching, decision to adopt or reject digital technology, empowerment, support from training, the current state of digital technology, and community barriers—the frequency of responses for each emergent theme for this Research Question 2 shown in Table 11.

Table 11:

Percentages of Codes by Individual Participants.

Teacher Code	Previous Knowledge	Basic Knowledge	Individual Barriers	Quality of Teaching	Decisions to Adopt or Reject DT	Empowerment	Support for Training	Current State of DT	Community Barriers
IAPT1	1	2	3	1	1	1	2	1	2
IAPT2	3	1	1	0	1	1	3	1	2
IAPT 3	2	2	1	2	2	3	1	2	1
IAPT4	1	1	3	1	0	2	1	1	1
IAPT5	0	2	1	0	0	1	1	0	2
IAPT6	2	0	2	1	0	3	2	0	1
IAPT7	1	1	1	1	1	1	1	1	1
IAPT8	2	1	2	2	2	2	3	2	2
IAPT9	1	2	1	0	1	2	1	2	1
IAPT 10	2	0	1	1	2	3	2	1	2
Total 124	15 3(12.0%)	12 (9.6%)	16 (12.9%)	9 (7.2%)	10 (8.0%)	19 (15.3%)	17 (13.7%)	11 (8.8%)	15 (12.0%) 100%

Note: This tables demonstrates the ffrequency of emergent codes for each Indigenous Amerindian preservice teacher aligned to diffusion of innovation theory (DOI) for RQ2 and IQ nine.

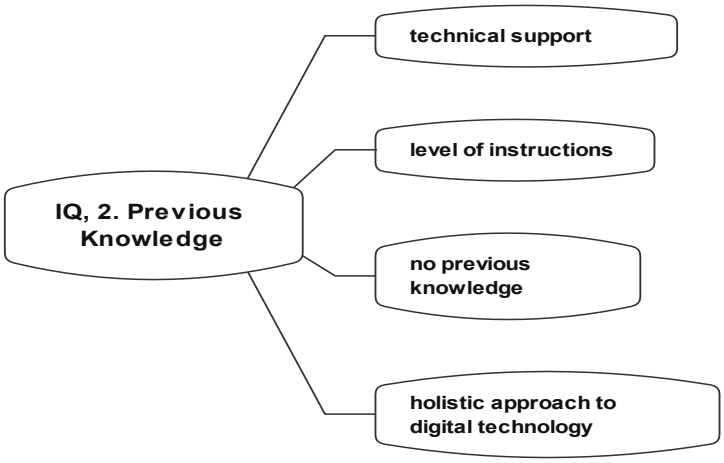
Theme 2: Factors that create barriers to Indigenous Amerindian preservice teachers' perception to adopt digital technology. In this section, I tried to understand individual indigenous Amerindian preservice teachers' perceptions of barriers to digital technology adoption. The figures in this section show the emergent code and sub-codes that were inductively generated from the interviews. All of the participants explained their barriers to adopt digital technology in response to interview question (IQ)-2

Emergent Code 1: Previous Knowledge. Fifteen text segments with code previous knowledge were coded. All of the segments that were coded aligned with the

conceptual framework. The emergent code and sub codes were found across all 10 participants (Figure 8).

Figure 8

Emergent Theme and Sub-Codes Aligned to RQ2 and IQ 2



Note: The figure demonstrates the elements associated with previous knowledge. RQ2- What are the institutional conflicts or obstacles hindering the adoption of instructional technology by Indigenous Amerindian preservice teachers?

The emergent pattern occurred within 12.0% (15/124) of the text segments, shared during IQ 2 that sought to find out participants' perceptions about the delivery of instruction with digital technology in their teaching practice. Eight of the 10 participants interviewed described the delivery of education concerning digital technology use. Teachers shared that the lack of previous knowledge of using digital technology affects their ability to understand the integration process of technology in their daily activities. IAPT 4 indicated that digital technology could not practically help novice teachers make

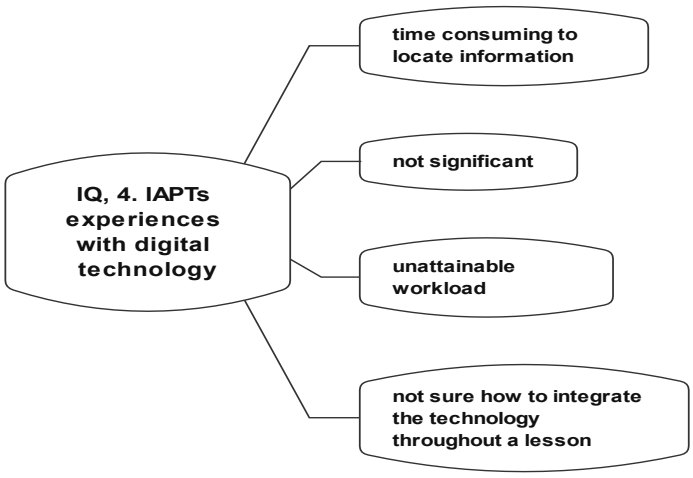
drastic changes when used in the classroom. She mentioned that she cannot imagine why some lecturers would use technology to present their work in PowerPoint mode, yet make demands for them to do the same when they have to make group presentations. She recalled the haphazard behavior of some adults when disposing of duties for trainees to follow. "I wish educators can stop seeing learners as high flyers, especially when it comes to technology. It is clear that instructors focus only on specific students to manipulate with technology because of 'assumption.'" She is of the view that assumptions cripple novice teachers who are in training, and these teachers will continue to be left behind. Such exposure would make it difficult for Indigenous Amerindian preservice teachers to implement technology when returning to their village. An example she contended was, "I have no knowledge of setting up a projector and my colleagues would try to set it up without the help of a technician or lecturer. This is also prevalent among the other ethnic groups." IAPTs 8 and 9 shared how the level of instructions received seemed far from reality.

Although Indigenous Amerindian preservice teachers found support for using digital technology, others issues such as level of instructions and technical support, need urgent attention so Indigenous Amerindian preservice teachers can understand the scope and magnitude of integrating digital technology. Additionally, IAPT 9 described that the lack of technological assistance has impinged on individual growth. IAPT 9 states, "the exposure I am getting in the technology course is not sufficient, so I have to engage in trial and error to get it right." She expressed confusion surrounding technological principles in relation to the integration process of technology into the classroom.

Emergent Code 2: Basic Knowledge. Twelve text segments with previous code knowledge were coded. All of the segments that were coded aligned with the conceptual framework. The emergent theme and sub codes were found across eight of the ten participants (Figure 9).

Figure 9.

Emergent Theme and Sub-Codes Aligned to RQ2 and IQ 4



Note: This figure demonstrates the elements associated with IAPT's experiences with digital technology RQ2- What are the institutional conflicts or obstacles hindering the adoption of instructional technology by Indigenous Amerindian preservice teachers?

The emergent pattern occurred within 9.6% (12/124) of text segments, shared during IQ 4 that sought to find out participants' experiences with integrating digital technologies. Participants shared information about the time they need to explore internet resources and set up cutting-edge technology to impart knowledge. While discussing their experiences with technology integration, IAPT 5 mentioned, "I felt like I needed to have more exposure to the actual application of technological strategies to change my perception of technology." IAPT 7 shared that her tutor always "sticks to a rubric" when assessing practice teaching. If she has to spend time setting up a projector or any cutting-edge technology, "instructional time will be questionable." IAPT 8 described how the planning process for preparing the "study kit" is not connecting with technology.

Although IAPT 8 appreciates the strategies the instructors used, sometimes she felt as if she was in the wrong place because of her lack of knowledge and insufficient skills even to attempt to integrate technology into the classroom. IAPT 6 and IAPT 10 reflected on their little technology experience to integrate a new tool into the classroom. IAPT 6 described "working along others when with possible" and "tap into their skills." Both participants gave credit to "trial and error" as the master teachers for integrating technology. IAPT 6 added, "I had just wanted to understand how effective the use [of] technological tools are to enhance learning. My 'trial and error' skills magnified after I was reluctant to seek assistance, I persevered to download videos even though I lost sleep." Additionally, IAPT 9 stated that she sought help from a colleague who resides in the capital city and who she assumed possessed a reservoir of knowledge about technology. She further stated, "as funny as it sounds, it is true. Initially, she was reluctant to help, but when she realized that I was as 'dumb as a doorpost', help was given. Our workload is remarkable; it is unattainable and makes it difficult for me to expand my 'trial and error' skills to use digital technology in my teaching practice."

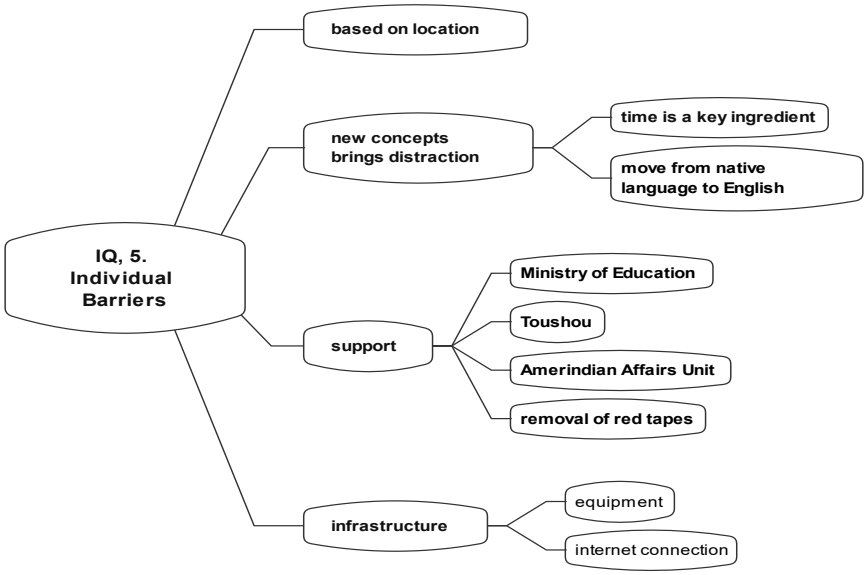
IAPT 1, 3, and 4 acknowledged digital technology as a game-changer for Indigenous Amerindian. IAPT 1 believed "the integration of digital technology has increased knowledge retention, life skills and collaboration among learners. Once IAPTs master technological skills, it can change the educational landscape for Amerindian teachers. "I am feeling excited … but there is always 'buts' when it comes to technology in the community. IAPT 3 shared, "if opportunities should arise for technology to be widespread, then gaining such skills would become my golden ticket. I mean wonders with lesson planning and activities for my little learners. I just like the idea, but say no

more". IAPT 4 reflected how digital technology could enhance the introduction, development, and conclusion of a lesson plan. This participant felt that "the opportunity is not there for Indigenous Amerindian preservice teachers to showcase their full potential with technology." She further felt that 'some of the lecturers are novices just like some of the IAPTs. This is serious… [and] they "can't begin to teach us the mechanisms that are required for teachers to integrate digital technology in lesson planning."

Emergent Code 3: Individual Barriers. Sixteen text segments with unique code barriers were coded. The emergent theme and sub codes were found across all participants (Figure10). The pattern occurred within 12.9% (16/124) of the text segments, shared during IQ 5 which sought to find out participants' barriers when integrating digital technology. All participants described the magnitude of barriers with which they are subjected when it comes to integrating technology.

Figure 10:

Emergent Code and Sub Codes Aligned to RQ 2 and IQ 5



Note: This figure demonstrates the depth of individual barriers associated with IAPT's position on IQ5 and RQ2- What are the institutional conflicts or obstacles hindering the adoption of instructional technology by Indigenous Amerindian preservice teachers?

Two participants, IAPT 4 and 7, described the depth of struggles when trying to integrate technology in the schools in their communities. IAPT 4 felt that limited technological experience might expose his weakness when he returns to his community. He believes that his "culture plays a major role in keeping him from embracing technological tools." Similarly, IAPT 7 shared that as a [Tribe], "we were taught not to embrace things that are not connected to our way of life, and digital technology is just one of them. With this tribal barrier, children in our communities are not exposed to modernized technology, but only to' radio' education in the classroom, which is a

distractor to many." Both teachers believe that placing digital technology as a new teaching tool would be chaotic.

Additionally, IAPT 6 felt that age, educational status, and time to get it done would establish individual and institutional barriers. Having no previous knowledge of technology, he believed, added pressure to his "aged brain." He was adamant that it was difficult to learn new things like 'digital technology at his age. Educational status in real-time creates a major disturbance, with having to remove from their community to the Professional Development Center. "We don't have the time to be behind digital technology all day just to learn digital technology and it would be "null and void" for the communities." IAPT 9 shared the importance of training for success. She felt that training was not an [one-shot] affair for Indigenous Amerindian teachers, creating more profound individual and institutional barriers. Her words were, "I am expecting to have professional development or continuous training about the use of digital technology. I have no training in the use of digital technology [and] various learning software, and the lack creates difficulty for those who want to use such tools in the classroom."

Besides, most participants felt that time was a crucial ingredient for Indigenous Amerindian preservice teachers to have integrated digital technology into the classroom. IAPT 5 shared, "It is difficult to master technological skill since I am working on English as my second language and simultaneously prepare teaching lessons, this is overwhelming, [and] currently time is the essence of understanding this thing called "technology." She felt that teachers needed to be committed to the process of integrating technology, and she was not prepared 'mentally, or physically' to use digital technology. IAPT 10 and 3 added that the "lack of technical support" emanating from the Ministry of

Education (MoE) and the Ministry of Amerindian Affairs created barriers for Indigenous Amerindian teachers in the Regions to attempt the use of digital technology for basic things. Both participants reiterated that the MoE would have sent computers and printers to several schools so teachers could have used them to prepare records, print worksheets, and engage the students. “Although the initiative is good for us, they are never used without the knowledge to operate this equipment.” IAPT 3 was vocal about the type of support [that] was required from different stakeholders. “We are treated as though we have ‘excellent knowledge of technology’…oh, boy…little do they know, all technological equipment is still in the boxes, we are not technicians.” Participants lamented on the lack of interest from the MoE. The MoE’s duty is to do a follow-up to ensure that the equipment delivered for educational purposes was being used effectively. Technical support was insignificant, and that created additional problems for schools to integrate digital technology. When sharing about the impact of barriers, IAPT 2, 6, 10, and 3 shared that their socio-economic situation had significantly threatened digital technology adoption. They shared that when living in remote riverine communities, residents are subjected to a high living cost, which affected them significantly. IAPT 2 reiterated that “a dollar is a dollar in any part of the country [and] salaries don’t address the true economic struggles of riverine communities.” All participants indicated their gratitude towards the government for providing one laptop per family, but the “Great wall computer is a failing Wall” … all we can do is laugh [because] it is like a ‘cow without a tail for fly season’ as my grandparents would say… useless.”

Another barrier was staying connected as opined by IAPT 10. She felt that Amerindian teachers who had smartphones had these phones to receive and send calls.

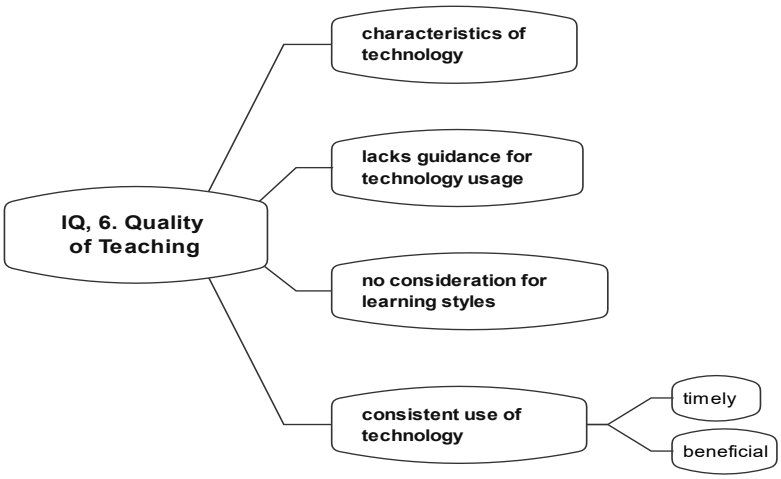
For them to stay connected on the internet, they must buy data, and that was not cheap. So, without economic support from officials, it would be difficult for schools in the Hinterland to attempt technology integration. Additionally, IAPT 4, 5, 6, 8, and 9 shared that "the Professional Development Centers should be our source supplier for digital technology, but that is far from reality." Participants described administrative shortcomings from poor communication, training, electricity, Wi-Fi accessibility to connectivity as pillars for them to integrate digital technology professionally. IAPT 4 shared that it was not effective because the administration released information in a 'piece-meal' fashion." Even though the respondents originated from far remote Regions, they embraced simple lifestyles that spoke directly to effective communication across the communities, which they said was. lacking at the institution.

Additionally, "information about using the institution's Wi-Fi was not disseminated correctly [hence] unbearable had to be encountered red-tape to get access to the computer lab, and internet connectivity was a problem. Wi-Fi access is not free, [but] if you 'snitched,' the admin would faster give access, and others will be left behind in this technological era." Additionally, the participants felt trapped, without knowing how to locate relevant materials, use of the hardware to integrate new content, and being plagued with unstable electricity supply. "My excitement to widen my knowledge dwindles based on the magnitude of institutional barrier," one had said.

Emergent Code 4: Quality of Teaching. Nine text segments with code quality of teaching were coded. The emergent themes and sub codes were found across eight of the participants (Figure 11).

Figure 11.

Emergent Theme and Sub Codes Aligned to RQ 2 and IQ 6



Note: This figure demonstrates IAPT's perceptions on the quality of teaching on the training institution. RQ2- What are the institutional conflicts or obstacles hindering the adoption of instructional technology by Indigenous Amerindian teachers?

The pattern occurred within 7.2% (9/124) of the text segments, shared during IQ 6 that sought to find out participants' experiences when using digital technology in training. In their interviews, Indigenous Amerindian preservice teachers felt jilted from technological skills because opportunities were not presented for teachers to integrate technology. IAPT 3 felt that "the institution failed to prepare Indigenous Amerindian preservice teachers to understand digital technology application before they entered the classrooms. For instance, when lecturers requested that students present notes of lessons via PowerPoint presentation, it was like "throwing water on a duck's back." That was difficult to accomplish without guidance. The difficulty was intensified because of the

heavy presence of the "chalk and talk" teaching method. IAPT 5 had recognized that this teaching method was dishonorable to the Professional Development Center. Additionally, she shared her openness to the teaching methods and the role it played to circumvent digital technology and created a wider margin for novice learners. IAPT 7 described how the integration of digital technology throughout a lesson would be good only if lecturers maintained their focus [by] breaking down the lesson's content and aligning it with the technology". Participants expressed disgust over the haphazard manner that technology is introduced at the institution, which they felt would result in 'no interest.'

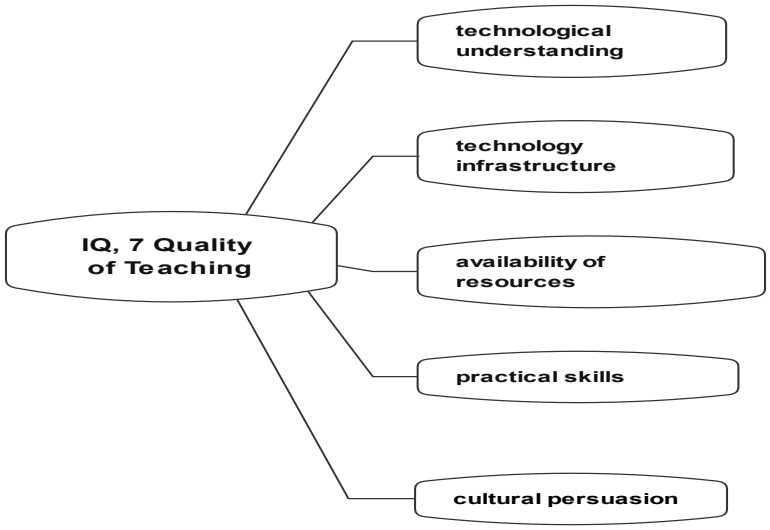
Additionally, although the use of digital technology gets full participation from the students, IAPT 6 shared her experiences from a networking standpoint where senior teachers within the school's system took the lead by guiding preservice teachers while they were on teaching practice (TP). Such a move showed how teachers and students could systemically benefit from technology integration. Besides, IAPT 10 described the role of quality teaching as the backbone for effective technology integration. She felt that quality teaching stemmed from technology policies by policymakers in conjunction with the training institute [and] was evident when senior teachers within the schools could have done more than the lecturers at the Professional Development Center. This was, however, questionable, since the aim of the Professional Development Center is to promote educational excellence for the society and not the society for the Center

Emergent Code 5: Decisions to Adopt or Reject Digital Technology. Ten text segments with code decision to adopt or reject digital technology were coded. The emergent theme and codes were found across all participants (Figure 12). The pattern occurred within

12.9% (16/124) of the text segments, shared during IQ 7 that sought to determine whether barriers play a role in their decision to adopt or reject digital technology.

Figure 12

Emergent Theme and Sub Codes for RQ 2 and IQ 7



Note: This figure demonstrates specific elements highlighted by IAPTs during training at the institution. RQ2- What are the institutional conflicts or obstacles hindering the adoption of instructional technology by Indigenous Amerindian preservice teachers?

Six out of 10 Indigenous Amerindian preservice teachers shared that their levels of understanding have impacted their decision to adopt digital technology as a teaching tool. IAPT 3 shared her level of frustration concerning digital technology. She felt that "the stake for integrating technology demanded a wider spectrum of technological understanding [and], the lack of knowledge, coupled with the absence of any real technology orientation, frustrated the process within the classroom. "I'm not sure if I can effectively adopt digital technology." Additionally, although the barriers are valid, they

would change his perception of wanting to adopt digital technology. IAPT 5 said, "I don't have to pressure myself to integrate digital technology into the classroom because I have no resources [and], yes, the barriers are steep and would prevent me from adopting digital technology. For instance, if one must spend excess time to locate materials, it is like looking for a "needle in a haystack." In this modernized world, it is not easy to make decisions to adopt digital technology." IAPT 7 felt that the skills gathered from the college were not enough to overcome the barriers since the Professional Development Center focused more on "academic rather than practical integration of new tools." Similarly, IAPT 8 felt that assessments are not technology-oriented and leave IAPTs in the open [and] unaware of the process, which made it harder to adopt digital technology as a teaching tool. "I just can't change my mind to adopt digital technology."

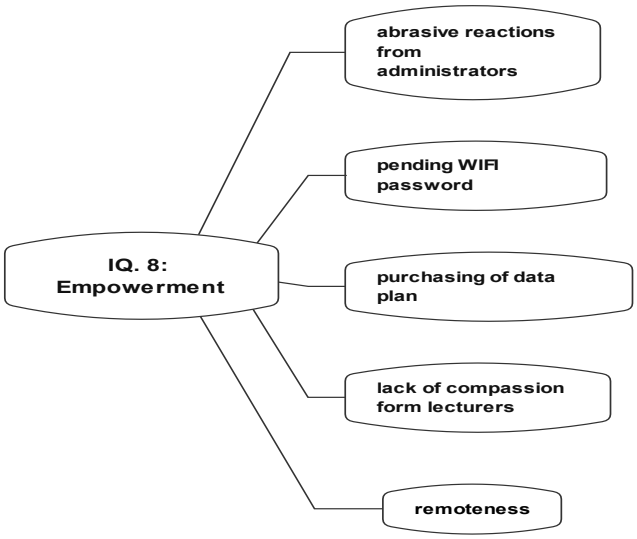
Additionally, IAPT 9 and 10 believed that if the other Indigenous Amerindian preservice teachers can push through the barriers, they both would try, [but] with technical support. IAPT 9 shared that the lack of technical support, poor internet connectivity, and unfavorable teaching and learning situations are beyond her ability to integrate digital technology while attending the college. On the other hand, four participants, IAPT 1, 2, 4, and 6, shared about the usefulness of technology and their choices to support digital technology adoption even though there are significant barriers associated with the integration process. For example, IAPT 1 indicated that the barriers act as motivators to bring real-life experiences to the students in remote communities. Two participants, IAPT 2 and 6, described the importance of keeping up with education changes for students to become more creative. IAPT 2 shared that living in rural Guyana, where the students have the desire to explore newer learning strategies, there is also the

lack of infrastructure, human, and poor communication between the village leaders, and the Ministry of Education, and this had become a major stumbling block for the community to make a difference. She felt that the education status of children in the community would improve with the use of digital technology. Even though the barriers challenged the outcome of innovation, she would use the barriers as stepping pillars to integrate digital technology into the classroom. IAPT 4 added, "You can use trial and error as pertinent strategies to place novice IAPTs in a better position to adopt digital technology," From a cultural perspective, "giving up is never an option [and] that provides a scope for networking for the effective integration of digital technology into the classroom." Participant IAPT 6 appreciated the barriers, [and] would use them to challenge his masculinity to create ways to overcome the obstacles associated with technology's integration process.

Emergent Code 6: Empowerment. Nineteen text segments with code empowerment were coded. The emergent theme and sub code were found across all participants (Figure13).

Figure 13

Emergent Code and Sub Code Aligned to RQ 2 and IQ 8



Note: This figure demonstrates IAPT's perceptions about empowering trainees to use digital technology within the curriculum. RQ2- What are the institutional conflicts or obstacles hindering the adoption of instructional technology by Indigenous Amerindian preservice teachers?

The pattern occurred within 15.3% (19/124) of the text segments, shared during IQ 8, that sought to find out participants' challenges when interacting with either the administration, lecturers, or anywhere else when tried to utilize the newly acquired technological skills and knowledge. All the Indigenous Amerindian preservice teachers who were interviewed shared their challenges stemming from empowering Indigenous Amerindian from the remote communities about digital technology at the Professional Development Center. During the interview, IAPT 1 said, "In his community, little

information about the importance of digital technology was divulged to them, by community leaders or teachers. For instance, in the schools, the teachers have never exposed us to any form of technological tools [and] now, I'm at the crossroads while I am in training, the struggle is real". While discussing their challenges, IAPT 2 and 6 shared that their technological skill sets are limited [in] a way that their phones are used primarily to send and receive calls…which is no basis for lecturers to equalize them.

Additionally, IAPT 3 shared the administration's role of limiting students to fast Wi-Fi when classes conclude at 4.30 pm. This leaves Indigenous Amerindian preservice teachers stranded on campus. The stipend given to preservice teachers per month cannot support additional expenditure [like] purchasing computers and data plans to satisfy pedagogical requirements. In addition, IAPT 4 acknowledged the patience that some lecturers would exercise with IAPTs [but] this is not enough for novice teachers to transition into digital technology [since] IAPTs are plagued with high socio-economic constrained.

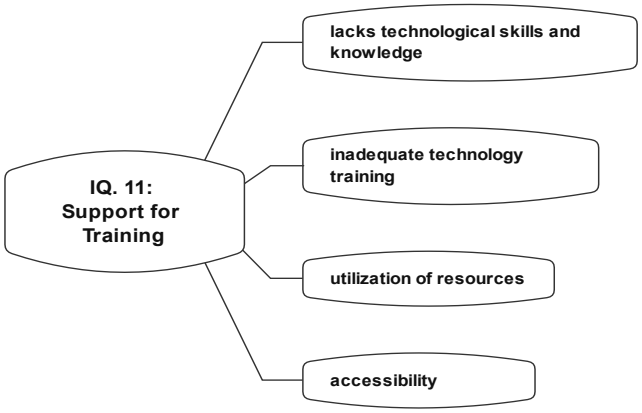
"Indigenous Amerindian preservice teachers are struggling, just for a better word, with digital technology. Indigenous Amerindian preservice teachers need to be taught by administrators and lecturers how to circumvent the barriers to improve pedagogy in terms of training. For example, the college only provides internet access from 1:00 pm-4:30 pm, and this is not coordinating with teaching practice and regular work program," IAPT 5, 7 and 10 shared, during the interviews, that the technological battle is real within the communities located in the most remote areas of Guyana. "The majority of the residents do not know technology [and] internet connectivity is far from reality." Further, IAPT 5 shared, "Indigenous Amerindian preservice teachers need time and continuous support

from the Regional Education Officers (REOs) to learn the application of digital technology in comfort [and] not to sidetrack the integration of technology across schools."

Emergent Code 7: Support for Training. Seventeen text segments with code support for training were coded. The emergent themes and sub codes were found across all participants (Figure 14).

Figure 14:

Emergent Code and Sub Codes Aligned to RQ 2and IQ 11.



Note: This figure demonstrates IAPTs concerns about the support necessary for teachers to integrate digital technology into the curriculum. RQ2- What are the institutional conflicts or obstacles hindering the adoption of instructional technology by Indigenous Amerindian preservice teachers?

The pattern occurred within 13.7% (17/124) of the text segments, shared during IQ 11, that sought to find out participants' most significant pedagogical barriers during training as they tried to integrate digital technology in the classroom. All the Indigenous

Amerindian preservice teachers who were interviewed shared their biggest pedagogical challenges as a lack of training. All the participants interviewed stated that their lack of training, access, knowledge, and support are the significant barriers to integrating digital technology. IAPT 4 shared, "Even if one has the resources, without skills and training, integrating technology would be of no importance." Additionally, IAPT 3, 7, and 10 shared that the Professional Development Center has the potential to provide more support to help Indigenous teachers to master technological skills within a shorter time [but] that is far from reality.

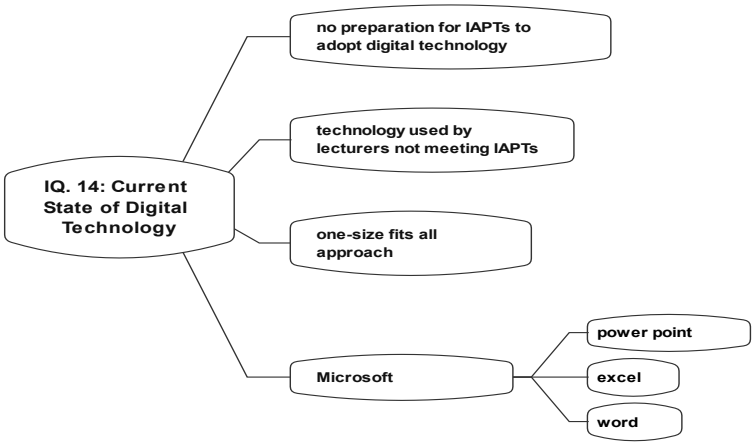
On the other hand, IAPT 8 stated, "My fears of not being more knowledgeable than my students is frustrating [and] discouraging towards adopting digital technology into the curriculum. No single digital technological tool can help the teacher to focus on class control and content delivery without frustration." Additionally, all the participants shared that accessibility of reliable computer lab and financial constraints to purchase an individual system are the most important hurdles for IAPTs to break the technology divide. IAPT 5 felt that the inconsistent access to the computer lab makes it difficult for teachers in training to fulfill the pedagogical mandate. Routine access to the hardware (i.e., computer, printer, etc.) and software (e.g., writing software and internet search, etc.) and inconsistent connectivity make it challenging to integrate digital technology into the classroom.

Emergent Code 8: Current State of Digital Technology. Eleven text segments with the current code state of digital technology were coded. The emergent theme and sub code were found across all participants (Figure 15). The pattern occurred within 8.8% (11/124)

of the text segments, shared during IQ 14, that sought to find the current state of digital technology while on teaching practice (TP).

Figure 15.

Emergent Code and Sub Code Aligned to RQ 2 and IQ 17



Note: This figure demonstrates IAPT's perceptions about the current state of digital technology at the training institution.RQ2- What are the institutional conflicts or obstacles hindering the adoption of instructional technology by Indigenous Amerindian preservice teachers?

All the Indigenous Amerindian preservice teachers who were interviewed shared their position on the current state of digital technology. All the participants believe that the college's current state of digital technology is not adequate to prepare Indigenous Amerindian preservice teachers to embrace digital technology into the curriculum effectively. IAPT 1, 2 and 3 shared that digital technology has the potential to enhance the teaching practice, once the lecturers provide the trainee teachers with skills that would enhance their preparation (i.e., lesson planning, scheme of work, resource unit, etc.) and

the execution of teaching practice. A small sample of the teaching population is currently exploring the use of the computer with presentation software to deliver aspects of their lessons. Similarly, IAPT 5 shared that "PowerPoint presentation software is the way to go [because] of its flexibility." Technology is used primarily in Physical Education sessions [basically] to enhance complex concepts and physical skills, especially via YouTube, where learners are required to analyze videos, transfer the information into Microsoft Excel or PowerPoint and use multiple skills so that the novice teachers can be a part of the process. IAPT 5 felt that the instructor approach towards technology integration is applicable and timely for students' learning. Besides, IAPT 7 believed that the current state of digital technology is inadequate since most of the lecturers have a one size fit all approach and the Indigenous Amerindian teachers become the victims. As a first-year student, the Educational Technology course is not preparing Indigenous Amerindian preservice teachers to adopt digital technology. He felt that ninety minutes per week is not appropriate for teachers without any previous knowledge of technology [and] this can be rectified if proper planning and policies are instituted.

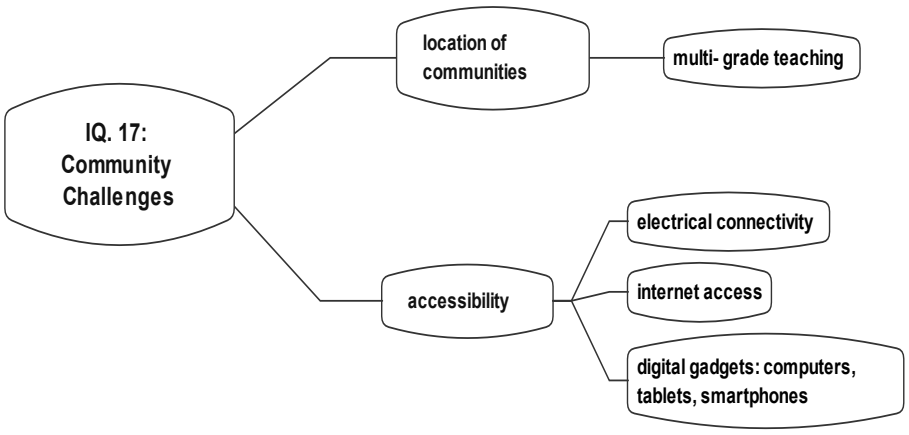
IAPT 9 proffered, "digital technology is used based on the lecturers; for instance, the Spanish teacher never utilizes the chalkboard during lectures. "Moodle and Edmodo platforms" are encouraged by her to create videos during conversations that help us to utilize different technological principles. Furthermore, I see the 'trial and error' method as being beneficial to novice learners in applying technology as a pedagogical tool." IAPT 3 and 10 believed that integrating digital technology into teaching practice will enhance students and teachers [but]this can only be possible once the lecturers see changes as

imperative to content delivery. They are not bent on the use of traditional methods of teaching.

Emergent Code 9: Community Challenges. Fifteen text segments with code community barriers were coded. The emergent pattern and sub codes were found across all participants (Figure 16). The pattern occurred within 12.0% (15/124), of the text segments, shared during IQ 17, that sought to find out participants' challenges in their environment that would mitigate against integrating digital technology into the classroom.

Figure 16.

Emergent Code and Sub Codes Aligned to RQ 2 and IQ 17.



Note: This figure demonstrates elements IAPTs perceived are important challenges that connects to their community and ability to change.RQ2- What are the institutional conflicts or obstacles hindering the adoption of instructional technology by Indigenous Amerindian preservice teachers?

The emergent pattern and sub codes were found across all participants (Figure 16). The pattern occurred within 12.0% (15/124) of the text segments, shared during IQ 17, that sought to find out participants' challenges in their environment that would mitigate against integrating digital technology into the classroom. All the Indigenous Amerindian preservice teachers who were interviewed shared their challenges stemming from the remote communities about integrating digital technology in the classroom. During the interview, participants were asked to reflect on their community and the challenges they may face in implementing digital technology into the curriculum. All the participants agreed that there are unforeseen challenges in their communities and the classrooms, ranging from a lack of knowledge to accessibility. IAPT 3 shared, "My community at Wakapoa is in Region Two, approximately 45 miles up the Pomeroon River. The community is far up the river, there is no access to the internet, and the only means of accessing electricity is by the sun (solar). Most of the people have never been exposed to this modern technology. When I use radio for the Interactive Radio Instruction (IRI), the other class students would usually stop their work and stare. If the radio is not powered, then exposing the students to IRI is pointless."

The participant felt that issues within her community are the deciding factors for digital technology to be used in the community. Similarly, IAPT 10 and 9 shared that their community is small; students are exposed to multi-grade teaching. The community is situated away from the mainland. Consideration of all these parameters will affect the integration of technology. The people in their community are not accustomed to computers, and not even to television, and the moment one tried to do something new, it is like "pulling out a wisdom tooth." It is difficult for any teacher working and living in

that area to introduce a new tool to the community. In addition, IAPT 2, 4, and 8 believed that six hours of electricity daily and poor internet signals from both providers –Guyana Telephone and telegraph and Digicel are challenges to the citizens of those communities to learn about digital technology and more so to help teachers with additional materials and skills that would boost learning.

Furthermore, IAPT 1 and 7 shared similar views about their communities, although they originated from different regions. IAPT 1 mentioned that gold mining is the main economic activity, and youngsters prefer to spend more time in the 'back dam.' IAPT 7 expressed the same view about citizens' livelihood by accepting sports as relaxation and not education because of the community's distance from the capital. "Maybe the Ministry of Education and the government abandoned us, poor infrastructure, and no technical support, compounded the degree of difficulty for me to integrate technology in my area. For example, I did try to use my computer to expose some youngsters; they showed no level of interest; this is challenging ." Lack of communication from village leader makes it difficult for students as IAPT 5 reflected on her community, and IAPT 6 noted that seniors' citizens within the communities would display a high level of resentment for new working tools such as digital technology. Such a pattern is visible among other groups within the community.

"The government and Non- governmental organizations would always come and start projects in our community but getting the youths involved is always a struggle, because after the personnel depart, no one gets access to anything. But there should be a way for information about the benefits of digital technology to spread across our community; then students would get to see and learn about digital technology."

Several participants commented that individuals need time to learn the basics and benefits of digital technology in order to recognize if it would make them "lose their practice and beliefs or enhance their communities and showcase their language before any adoption can take place."

Research Question 3

The third Research Question was: What are the 'perceived coping and adapting' mechanisms to overcome obstacles to the integration of digital technology by Indigenous Amerindian preservice teachers? I coded 70 text segments for Research Question 3. Participants were asked to reflect on their perceived coping and adapting mechanisms to overcome digital technology obstacles. There were five themes that emerged during the semistructured interview: teaching preparation, working technology plan, constant professional development, motivational tool, and adopters. The frequency of responses for each theme for this Research Question 3 are shown in Table12

Table 12.

Frequency of Emergent Codes Aligned to DOI, TAM and RQ 3.

Teacher Code	Teaching Preparation	Working Technology Plan	Constant Professional Development	Motivational Tool	Adopters	
IAPT1	2	1	2	2	1	
IAPT2	1	1	0	3	2	
IAPT 3	1	2	2	1	1	
IAPT4	3	1	1	2	0	
IAPT5	2	3	2	0	0	
IAPT6	1	1	1	1	0	
IAPT7	2	2	2	1	1	
IAPT8	3	2	2	2	1	
IAPT9	1	1	0	2	1	
IAPT 10	1	1	2	1	2	
Total	17	15	14	15	9	Total 70
	(24.2%)	(21.4%)	(20%)	(21.4%)	(12.8%)	100%

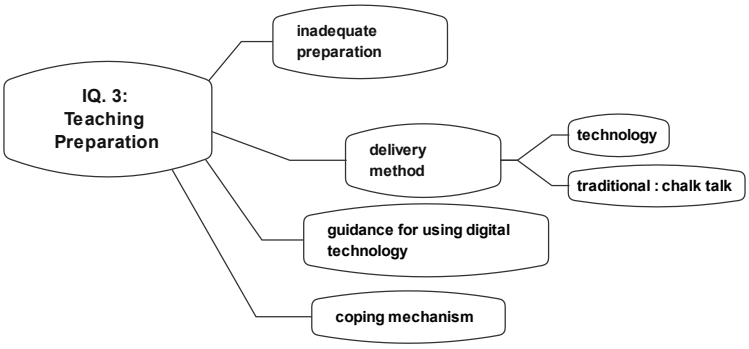
Note: This table demonstrates the percentages of subcodes emerged from RQ 3- What are the perceived coping and adapting mechanisms used to overcome the obstacles for the integration of digital technology by Indigenous Amerindian preservice teachers? Each participant aligned their position to the DOI theory and TAM model.

Theme 3: Factors coping mechanism to Indigenous Amerindian preservice teachers' perception to adopt digital technology. In this section, I tried to understand the coping mechanism of indigenous Amerindian preservice teachers' perceptions of digital technology adoption. The figures in this section show the emergent code and sub-codes that were inductively generated from the interviews. All 10 participants described their coping mechanisms to overcome obstacles for integrating digital technology based on interview question (IQ)-3

Emergent Code1: Teaching Preparation. Seventeen text segments with code teaching preparation were coded. All of the segments that were coded aligned with the conceptual framework. The emergent theme and sub codes were found across all 10 participants (Figure 17).

Figure 17.

Emergent Code and Sub Code Aligned to RQ 3 and IQ 3



Note: This figure demonstrates IAPT's perceptions about the depth of teacher preparation for adopting new teaching tools into the classroom. RQ3- What are the perceived coping and adapting mechanisms used to overcome the obstacles for the integration of digital technology by Indigenous Amerindian preservice teachers?

The emergent pattern occurred within 24.2% (17/70) of the text segments, shared during IQ 3 that sought to determine the level of teaching preparation of participants towards the use of digital technology. In their interviews, participants described their training level based on practice, teaching methods, and teaching strategies. In their interviews, teachers felt the preparation for integrating digital technology into the classroom was inadequate and that their training lacks modern techniques and guidance. I will discuss their responses in separate paragraphs below.

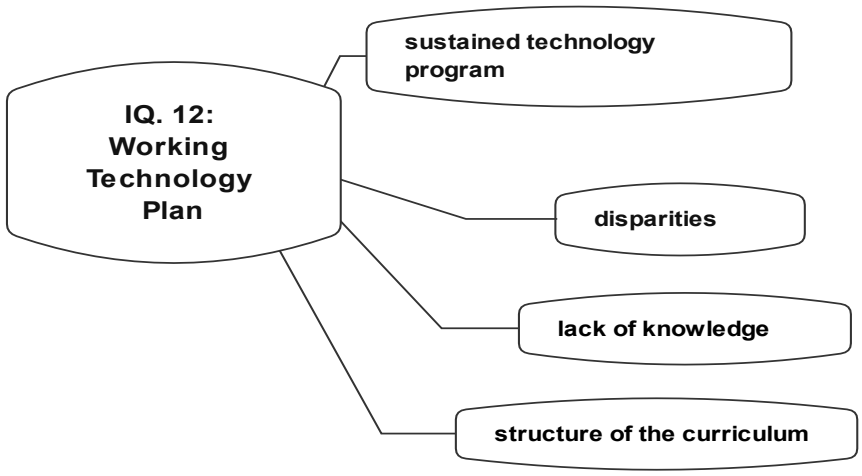
Teachers were open in voicing how they felt about the lack of support towards integrating digital technology in a meaningful way. Three teachers described how the preparation for technology integration is "far from reality" since most lecturers make little technology application. IAPT 1 shared her honesty with the preparation of technology into the classroom as a "slow and insignificant process tainted with the antique teaching method." She emphasized that "training is dynamic" and must stimulate the minds of learners to become dynamic game changers. Additionally, IAPT 2 described teaching preparation as models that evolved over the years and not sticking to "chalk and talk" as the only approach… don't get me wrong about "chalk and talk." The children cannot learn the same way we did. IAPT 7 shared a similar experience by saying, "preparing teachers for this new body of learners calls for different approaches based on education theorist." She believes that teaching strategies should cater to diverse learners and must manifest during training. Two participants IAPT 9 and 10, described their preparation method as a combination of traditional and modern. "Most of our lectures are using the 'chalk, and talk' method and the few who are using digital technology focus only on PowerPoint." Three participants, IAPT 4, 5, and 8, indicated that "they were told to prepare PowerPoint and download videos to enhance presentation without any initial guidance." "IAPT 6 replied, "interesting how training is done." IAPT 3 stated that she is coping with the level of preparation since, within the math program, there is a demand for technology use. She still looks for the integration of 'chalk and talk' as a backup for practical activities. On the other hand, all participants described the training they are getting as mediocre for Indigenous Amerindian preservice teachers in training to embrace

digital technology. These viewpoints run side-by-side with Indigenous Amerindian preservice teachers' perceptions and the use of digital technology.

Emergent Code 2: Working Technology Plan. Fifteen text segments with code working technology plans were coded. The emergent theme and sub codes were found across all 10 participants (Figure 18).

Figure 18.

Emergent Code and Sub Code Aligned to RQ 3and IQ 12



Note: This figure demonstrates IAPT's strategies to adopt digital technology in their pedagogical practices.

The emergent pattern occurred within 21.4% (15/70) of the text segments, shared during IQ 12 that sought to find out changes' participants would you like to see in the teacher training program for Indigenous Amerindian preservice teachers to become adopters of digital technology. All 10 participants responded that they would like to see a sustained technology plan from first to the final year that caters to the novice Indigenous

Amerindian preservice teachers. IAPT 3 described the type of changes that would satisfactorily meet Indigenous Amerindian preservice. She believes that Indigenous teachers are treated differently from other ethnic groups when it comes to technology use. “It’s like, Indigenous Amerindian preservice teachers are wealthy, have strong knowledge about technology and the necessary resources to sustain digital technology while in training. This stigma must change. I wish to say that Indigenous Amerindian preservice teachers in a cluster would have little knowledge of technology and still have to spend time figuring out how to utilize minimal skills.

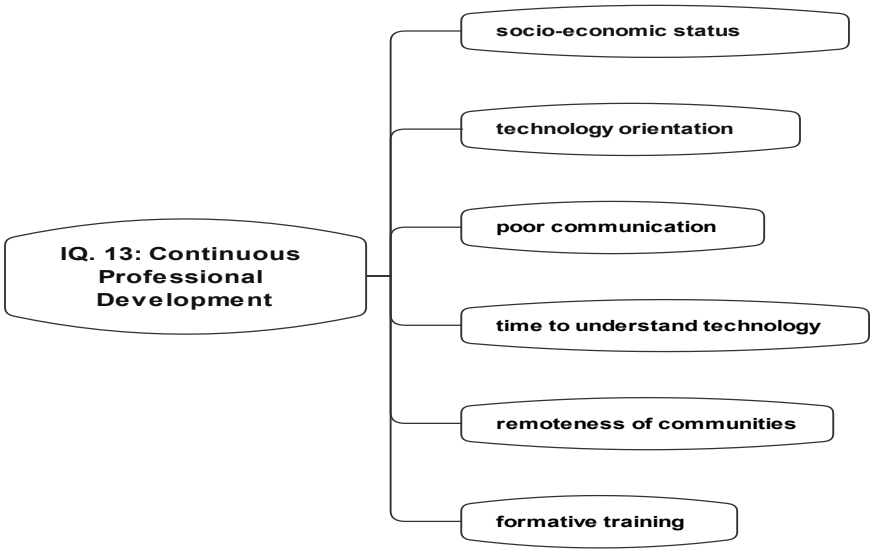
On the other hand, another segment of the teachers would be very resistant to changes for several reasons. Either way, Indigenous Amerindian preservice teachers need to master appropriate skills to adopt digital technology into the classroom. IAPT 4 felt that the lack of necessary technical knowledge is still questionable at this tertiary level. The institution is here to prepare teachers for the real world better, and that is not forthcoming. He believes that the teaching program should have systemic approaches for Indigenous Amerindian preservice teachers to gather skills and utilize them when called to execute plans. IAPT 6 shared, “if administrators try to understand Indigenous Amerindian preservice teachers’ feelings, they would align the curriculum to meet their beliefs and practices.” By instituting changes, Indigenous Amerindian preservice teachers can learn more about the positives and negatives of digital technology and transfer them into the classroom. Participant IAPT 10 described instructors as “patience.” She is of the view that the Ministry of Education, in collaboration with other stakeholders, should draft policies that would help all preservice teachers to use technology in the classroom. Most participants acknowledge that for the adoption of digital technology to be meaningful, the

institution must prepare to adjust the content by adding local Indigenous content. It will help Indigenous Amerindian select diverse paths for adopting digital technology as a teaching tool in the classroom.

Emergent Code 3: Continuous Professional Development. Eight text segments with code ongoing professional development were coded. The emergent theme and sub codes were found across eight of 10 participants (Figure 19).

Figure 19.

Emergent Code and Sub Code Aligned to RQ 3 and IQ 13



*Note***:** This figure demonstrates the needs for training institutions to provide ongoing professional development for IAPT's.

The emergent pattern occurred within 20% (14/20) of the text segments, shared during, IQ 13 that sought to find out participant's view of the most significant factors that may hinder or promote the adoption of digital technology. Participants shared their

opinions about the influential factors that delay their adoption of digital technology into the classroom. IAPT 1 stated, "it depends on the depth of orientation about the use of technology provided by the institution. My treatment at the institution was nothing less than unfavored, impacting my decision to integrate digital technology. I might come from an area where resources are scarce, but my belief and practices would never change me. I am not interested in technology in my classroom if this is what I have to be exposed to get some knowledge about the tools". IAPT 6 felt that digital technology has the potential to be adopted by preservice teachers. She maintains that "poor communication about the pros and cons of digital technology would hinder the rate of adoption." For example, she commented that in "Agriculture Science, most of the teachers use some form of technology as guidance, but that information is not dispersed throughout the class." Despite individual preservice teachers using technology, the teacher noted that everyone needs to be exposed to the same information about the role of technology in education and make comprehensive decisions about the tool. The lecturers need to encourage all learners to try new technology skills and provide guidance where necessary to strengthen the adoption rate.

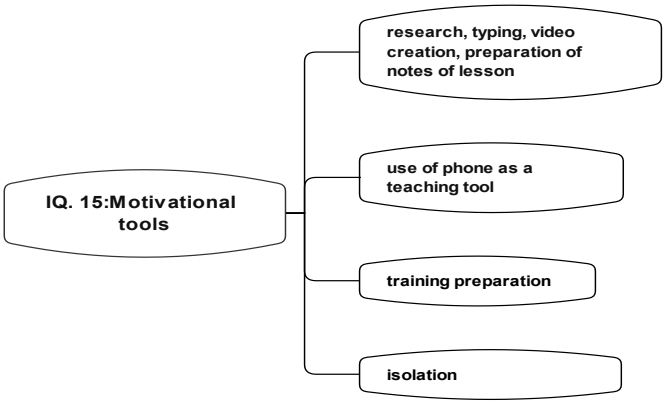
Several participants mentioned that time to understand and learn about technology would hinder their ability to adopt digital technology. According to IAPT 3, "coming from a remote area beyond the Kanuku Mountains in District nine is divided by thick forest, makes it challenging. The topography causes citizens to live scattered lives; thus, our daily activities don't require any new knowledge. So, for me to adopt a new skill like the use of technology, the instructor must have a plan or a step by step book, he must be patient and have the time to ensure that teachers can master basic steps."

Similarly, IAPT 8 shared her hindrances in relation to her early years of education where Catholic ministers imparted their knowledge, and specific values were instilled, and, to date, she is still engaged in practices that bring the community together. "It takes time, and now to use digital technology would take a longer time to implement, because I know my learning ability. Adopting technology would be difficult if there is no technological plan in place".

***Emergent Code 4: Motivational Plan*.** Fifteen text segments were another emergent pattern for IQ 15: What is their usage pattern of digital technology during their training? The emergent pattern (21.4%, 15/70) was in the emergent themes and sub codes of 8 of the 10 participants' interviews (Figure 20).

Figure 20.

Emergent Code and Sub Codes Aligned to RQ 3 and IQ 15.



Note: This figure demonstrates strategies a training can used to motivate IAPT's. RQ3- What are the perceived coping and adapting mechanisms used to overcome the

obstacles for the integration of digital technology by Indigenous Amerindian pre-service teachers?

Participants shared about using digital technology for research, typing individual study reports, assignments, creating short videos using movie maker, and introducing lessons to learners. IAPT 3 mentioned that “I was introduced to Microsoft excel by my Business Studies lecturer, and it has helped me with tabulation and data organization.” Additionally, “I am currently using Microsoft excel tool to teach students how to calculate percentages and construct graphs.” As an Indigenous Amerindian preservice teacher in the context of training, “I am expected to use Excel software to construct worksheets, create a register, and organized class list in accordance with the weekly work program. Additionally, IAPT 1, 7, 8, and 9 shared the usefulness of digital technology in preparing notes of lessons, retrieving the curriculum from the MoE’s website about individual subjects, and skills to utilize technology.

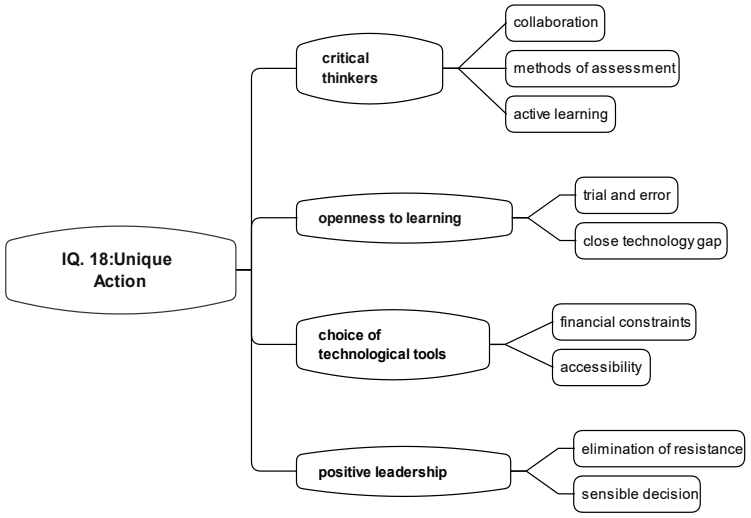
For example, IAPT 2 stated that she is not using any technology because of her limited knowledge of technology, and she is hoping to become a user in the future. Similarly, IAPT 4 shared, “computers are used in the preparation of assignments, but I’m punishing with adapting to the process, since I have no typing skills, I have to use one finger to complete work on the computer.” IAPT 5 shared that the phone is used primarily to play songs and video clips for the students. “It makes life easier for the teacher to help the little ones with skills such as reciting, counting, and working together”. Participants provided additional examples of how they used digital technology during training. IAPT 2 and10 indicated that they are isolated since digital technology is complicated for them to manage. The participants noted that their “handwriting is

impeccable" and don't want to lose their calligraphic skills to digital technology. IAPT 2 shared that it takes a longer time to prepare work using technology, and they find it more difficult than writing by hand, even though they believe that software can assist the novice teachers. To build on handwriting skills, IAPT 10 found that there are "speech to text apps for writing assignment and read aloud to the students", but she is of the view that that may not be applicable to the community. For instance, IAPT 2 shared "the importance for the indigenous teacher to use apps from play store or google will help with the scope of digital technology as it relates to the modification of the delivery of content that will make learning fun." In addition, technology motivates students, and it benefits students because they can self-pace the work, and it also prepares students for the future. She noted that the technology would most certainly help teachers for grading of examination scripts. IAPT 1 shared how digital technology can improve planning, writing resource units, and gathering information from textbooks. This approach provides additional time for teachers to work on other areas of teaching practice".

Emergent Code 5: Unique Actions. IQ 18: What actions alter your acceptance of digital technology use as a pedagogical tool? (As shown in figure 21)

Figure 21:

Emergent Code and Sub code Aligned to RQ 3 and IQ18.



Note: This figure demonstrates the action a training institution should take to allow IAPT's access to digital technology. RQ #3-What are the perceived coping and adapting mechanisms used to overcome the obstacles for the integration of digital technology by Indigenous Amerindian preservice teachers?

Participant responses indicate that digital technology as a pedagogical tool can transform learners into twenty-first-century thinkers. Participant IAPT 8 described different situations that changed her outlook towards using digital technology as a pedagogical tool that supports collaboration, group conversations, and various assessments. The notion of cooperation within the classroom was also reflected by IAPT 10, "I see the students become alive when any practical work is conducted. Using digital technology as a pedagogical tool would foster collaboration among learners and educators. I believe the greater the interaction among learners, the faster the acceptance

of digital technology among indigenous teachers, and it would transform into a child-friendly learning environment."

IAPT 7 opined that all student teachers must have an equal opportunity to learning resources that can make an undeniable impact on our journey to be qualified educators. He observed that access to resources would stimulate Indigenous Amerindian to see digital technology as a transformative tool for professional growth. Additionally, IAPT 5 stated, "It is time for the institution to see Indigenous preservice teachers as Guyanese and don't treat us differently so we can be more open to embracing new pedagogical strategies that support the use of digital technology. This notion of openness within the classroom was reflected by IAPT 9."As digital technology becomes mandatory for teachers in training, it would appeal more to my consciousness to accept changes. As an indigenous educator, I want to take risks like my other colleagues, to improve my teaching style. Probably, the more chances I take during my training tenure, I would be able to make better decisions for my students and colleagues when I return to my community."

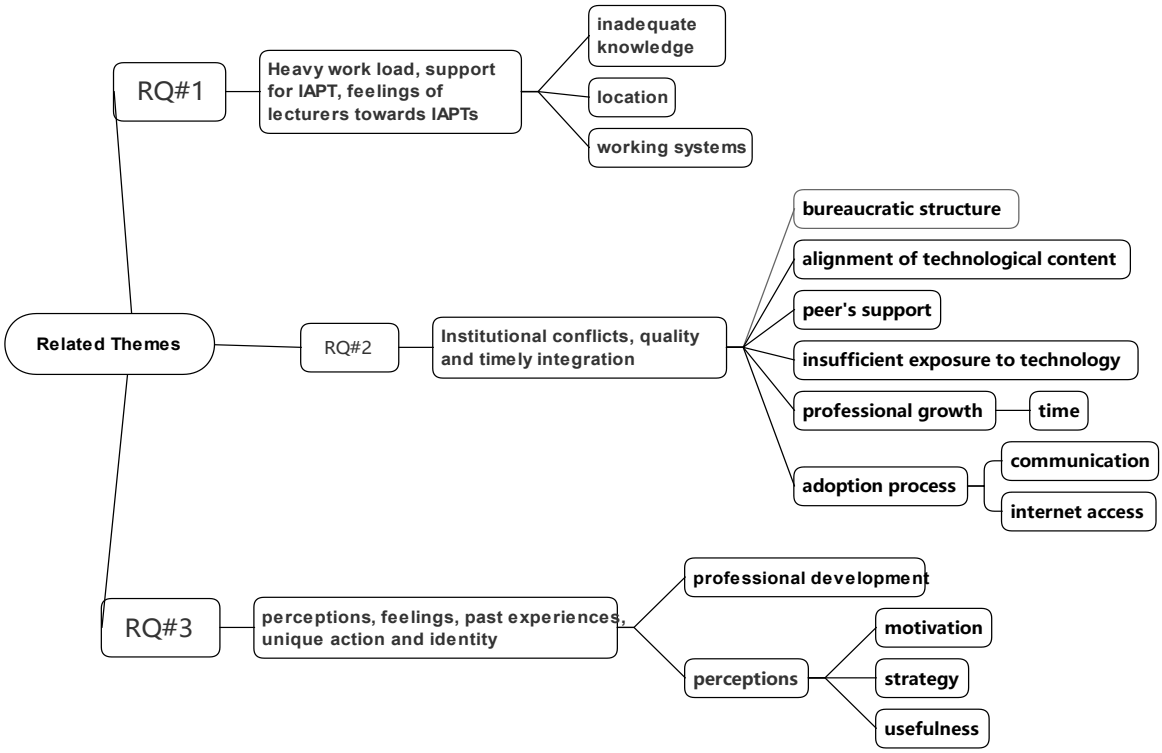
IAPT 3 and 6 shared that "their limited exposure to technology has caused them to widen their digital technology approach. IAPT 3 indicated that "the benefits would overcome the negatives," while IAPT 6 shared that technology is expensive for him due to economic constraints. However, it would not detour him from choosing the least expensive one and apply it to the classroom. Participants IAPT 1, 2, and 4 acknowledged that digital technology could be acceptable by Indigenous Amerindian teachers only if the Ministry of Education spends more money on computer labs for all schools to produce better technological learners. IAPT 1 echoed the need for positive leadership while

training so the skills can be transcended across the board. Likely, IAPT 2 believes that making smart decisions for the adoption of digital technology is paramount not only for hinterland teachers but also for the heads of the institution and schools. Moreover, it would be mandatory for the institution to provide an atmosphere that supports Indigenous Amerindian preservice teachers' decisions to eliminate resistance and have a holistic approach towards new pedagogical practices.

In conclusion, the key findings of this study are interrelated to themes and all the research questions. Many interview items resulting in themes related to Research Questions 1, 2, and 3, are shown in Figure 22

Figure 22.

Emergent themes and sub themes related to RQ1, RQ2, & RQ3.



Note: Figure demonstrates the connectivity nature of themes to RQ 1: What are Indigenous Amerindians preservice teachers' perceptions of the adoption of digital technology in their daily pedagogical practices?, RQ 2: What are the perceived barriers to the adoption of digital technology by Indigenous Amerindians preservice teachers?, and RQ 3: What are the perceived coping and adapting mechanisms used to overcome the barriers to the integration of digital technology by Indigenous Amerindians preservice teachers?

Key Findings for Research Question 1.

Results show that based on participants' responses, the following themes are related to Research Question 1. These are heavy workloads, support for Indigenous Amerindian preservice teachers, even though digital technology can be complicated, and lecturers' emotional state towards Indigenous Amerindian preservice teachers (Table 13). Along with these three items, the preservice teachers believe that the institution has the mandate to ensure that Indigenous Amerindian preservice teachers are provided with technological skills to succeed.

Table 13.

Related Emergent Themes Common Among RQ 1, RQ 2 and RQ 3.

Teacher Code	Workload	Support	Emotional State	Total *(N=68)*
IAPT1	3	4	2	9
IAPT2	0	1	1	2
IAPT3	2	4	3	9
IAPT4	4	3	3	10
IAPT5	0	2	2	4
IAPT6	2	3	4	9
IAPT7	1	1	1	3
IAPT8	3	1	2	6
IAPT9	4	5	1	10
IAPT10	1	3	3	7
Total	20 (14.7%)	26 (38.2%)	22 (32.3%)	100 %

Note: The table demonstrates the percentages of common themes among RQ 1: What are Indigenous Amerindians preservice teachers' perceptions of the adoption of digital technology in their daily pedagogical practices?, RQ 2: What are the perceived barriers to the adoption of digital technology by Indigenous Amerindians preservice teachers?, and RQ 3: What are the perceived coping and adapting mechanisms used to overcome

the barriers to the integration of digital technology by Indigenous Amerindians preservice teachers?

Related Theme1: Workload: All participants expressed the view that the institution's workload does have an impact on the integration of digital technology. Participants: IAPT 1, 4, 6, 7, and 9 explained their perception of the depth of training concerning integrating digital technology. Indigenous Amerindian preservice teachers expressed the view that integrating digital technology into the classroom would make a difference but is the pedagogical preparation is burdensome. IAPT 1 noted that the volume of theoretical work preservice teachers committed to daily had thwarted Indigenous teachers' minds to consider "digital technology." IAPT 4 believed that lecturers do not consider prescribed time for each course, which is tough on preservice teachers who want to develop professionally.

Further, learning to use technology is a task and can be personalized for professional growth; hence adequate time is needs for teachers to develop technological skills. Also, IAPTs 7 and 9 shared that the best way to reduce the workload is to have a more practical learning approach. We believe in quality learning and not quantity. The amount of lecture notes preservice teachers have to write daily is painstaking. This was echoed by IAPTs 2, 3, 5,8, and 10. They believe that the institution is not keeping up with modern pedagogical methods while in training, and such practice is evident across all programs. Further, if learning today is the same as the instructors did, we are unsure if the institution is fervently preparing indigenous teachers for the real world.

***Related Theme 2: Support*:** All participants believe that the approach would not work for the Indigenous Amerindian teachers, especially those with little or no knowledge of

technology and no external support. IAPT 3, 5, 7, and 10 noted that the knowledge provided to Indigenous Amerindian at the institutions is not adequate to sustain the adoption of new instructional technology. The participants were open and felt that technology's challenges and the need for special skills to maintain digital technology are vital for the classroom application. IAPT 1, 2, and 6 reiterated that digital technology knowledge should be simple, with multiple overlapping topics that connect to all the curriculum. They expressed their opinion on how the institution still focuses on the traditional way of delivering instruction in this digital age, with little connection to digital technology. IAPT 8 noted that his current location could not sustain digital technology as a teaching tool. For example, he recognized that the Professional Development Center has an Educational Technology class. Still, it is not geared toward multi-grade teaching, and many of the Indigenous Amerindian teachers are satisfying themselves with the thought of just completing the program and returning to their community. IAPT 4 and 9 stated, "There are not enough working systems in the computer room, and they have to share with colleagues and instructors 90% of the time." Even though preservice teachers share systems, it is not gearing to sound pedagogical principles.

Related Theme 3: Emotional State of Lecturers: Six participants indicated that lecturers' knowledge about technology is inadequate for Indigenous teachers to work at their best to ensure the successful implementation of digital technology within the classrooms. IAPT 1 stated, "I don't know what will be the outcome when I am attempting to use digital technology as an instructional tool." She emphasized that lecturers need to elaborate more on the application of technology to prepare teachers in training with requisite knowledge better. IAPT 2 indicated, "Typically, I have some skill set that would allow me to remain

in the pack." He continued that it should be noted that he does have some amount of previous knowledge that compliments the workload and support at the college. IAPT 5 indicated that she is at ease with the application of digital technology as a support tool, but not comfortable with lecturers' approach. IAPT 4 stated, "I had no idea that digital technology would have been challenging for preservice teachers to use." In addition to the challenges of using digital technology, participants provided descriptions of lecturers' approach to technology integration. IAPT 8 stated, "From the time digital technology was introduced, I have seen it as a supporting tool for the lecturers and not for the Indigenous Amerindian student teachers. IAPT 10 specified, "I expected to be taught about the usefulness of digital technology and how to engage students in the classroom and not use the "chalk and talk" method of teaching."

Key Findings for Research Question 2

Institutional Structure. The participants described the institutional procedure as the overall focus that addressed RQ 2 and RQ 3 (as seen in Table 14).

Table 14

Relating Themes to RQ 2 and RQ 3

Teachers Code	Bureaucratic Structure	Insufficient Exposure	Effects of Digital Technology	Total *(N=79)*
IAPT1	2	1	2	5
IAPT2	3	2	1	6
IAPT3	4	3	3	10
IAPT4	2	2	4	8
IAPT5	1	4	2	7
IAPT6	3	2	4	9
IAPT7	3	3	2	8
IAPT8	5	1	4	10
IAPT9	3	3	1	7
IAPT10	2	4	3	9
Total	28 (35.4%)	25 (31.6%)	26 (32.9%)	100%

Note The figure depicts the percentage of participants reaction to relating themes for RQ 2: What are the perceived barriers to the adoption of digital technology by Indigenous Amerindians preservice teachers? and RQ 3: What are the perceived coping and adapting mechanisms used to overcome the barriers to the integration of digital technology by Indigenous Amerindians preservice teachers?

Related Theme 1: Bureaucratic Structure. All participants have agreed that the institution's bureaucratic structure is not conducive for novice Indigenous teachers to embrace digital technology as a teaching tool. IAPTs 3, 5, 6, 9, and 10 agree that the technological content and structure of curriculum are not aligned to their pedagogical journey. The participants found that the teaching practice structure is addressing only individual levels of learners, no technological scope, and the Indigenous way of learning. IAPT 1,4 and 8 supported the institution's technology integration method. However, they named factors such as "limited internet connectivity, non-functioning devices, accessibility to Wi-Fi password as bureaucratic and difficult for Indigenous Amerindian preservice teachers to get involved in digital technology. As well as, IAPTs 2 and 7 noted that introducing digital technology is an integral part of the training, but for Indigenous Amerindian preservice teachers' integrating digital technology is as a result of peer's support, which also addressed Research Question 2. Another commonality among the Indigenous Amerindian preservice teachers related to digital technology obstacles for students is insufficient exposure.

Related Theme 2: Insufficient Exposure. All the participants noted that lecturers' use of digital technology is more for personal gain than for academic enhancement. The

adoption of digital technology is a critical component for the teachers in training, which relates to the second research question. IAPT 3, 4, 6, and 9 believed that Indigenous Amerindian preservice teachers' professional growth is a priority for them to make decisions to adopt digital technology as a teaching tool rather than seeing technology as another useless instrument. Preparing educators to make sensible decisions for the twenty-first-century classroom by addressing the adoption process of digital technology is discussed in the nature of the study, as this preparation helps Indigenous Amerindian educators assess the technological process with a holistic ideology. All participants agreed that communication at the Professional Development Center is lacking and that limited internet access and connectivity are barriers to digital technology's adoption process.

All the participants are desirous of there being some improvement in communication and internet access and other infrastructure to support digital technology. It is imperative to note that internet access and communication are significant hindrances to digital technology adoption. Internet access and communication relate directly to research question two. IAPTs 1, 8, 7 and 10 shared their interest in the technical support after adopting digital technology within their communities. They are of the view that the first-hand exposure of the tool will not be adequate for the transformation of learners. Besides, all participants believed that the way administrators and lecturers approached the integration process of technology demonstrates the limited scope for novice Indigenous Amerindian teachers. The participants also noted that the time **s**pent for Indigenous Amerindian preservice teachers to master digital technology is defeating the purpose of training.

Related Theme 3: Effects of Digital Technology. IAPT 1, 3, 4 and 6, indicated that digital technology would affect the actual performance of indigenous Amerindian teachers and students in riverine schools because it is new and is difficult to implement during instruction time. IAPT 1 and IAPT 3 and 6 indicated, "There wasn't enough practice of digital technology at the institution so we can't smoothly integrate the tool. This operation impacts our technological adoption decision". IAPT 3 indicated, "I think the time allotted for the teaching of Educational Technology is inadequate when one considers our insignificant experiences and limited exposure for technology." IAPT 4 and 6 commented on infrastructure that supports the technology. IAPT 6 specified, "I thought it would be something that the administrators and lecturers cannot handle. Maybe there are no policies or any built-in instructions to support digital technology effectively."

Key Findings for Research Question 3

Organization and management. The participants described organization and management as the overall focus that addressed RQ 1 and RQ 3 (as seen in Table 15).

Table 15.

Research Question 3 with Related Emergent Theme from RQ1 and RQ3

Teachers Code	Implementation	Professional Development	Perceptions	Total *(N=101)*
IAPT1	2	3	3	8
IAPT2	3	5	5	13
IAPT3	6	4	4	14
IAPT4	2	4	3	9
IAPT5	4	2	4	10
IAPT6	1	3	5	9
IAPT7	1	4	3	8
IAPT8	2	4	2	8
IAPT9	3	5	3	11
IAPT10	4	3	4	11
Total	28 (27.7%)	37 (36.6%)	36 (35.6%	100%

Note: The table demonstrates the percentages of emergent themes in relation to RQ 1: What are Indigenous Amerindians preservice teachers' perceptions of the adoption of digital technology in their daily pedagogical practices? and RQ 3: What are the perceived coping and adapting mechanisms used to overcome the barriers to the integration of digital technology by Indigenous Amerindians preservice teachers?

Related Theme 1: Implementation: This theme identifies as the coping mechanism for Indigenous Amerindian preservice teachers to adopt digital technology. All participants characterized the implementation process through their perceptions, feelings, past experiences, and identity. All the participants explained how their perceptions about digital technology have changed after they enrolled at the college. Four participants IAPT 1, 3, 4, and 10, acknowledged their perception as one of the positive vibes. IAPT 1 noted, "I don't think that the way the technology is delivered is adequate." IAPT 3 summarized, "I was thinking it would be something for the lecturers to consider when using the device. I had it at the back of my head that I would be a part of the implementation steps." IAPT 4 indicated, "I don't think our effort into the execution of digital technology into the

curriculum is accurate." IAPT 10 stated, "I had an open mind, and it helped me to increase my rate of embracing digital technology."

The interview data and the researcher's journal notes mentioned feelings, past experiences, and identity. IAPT 2 and 7 indicated that their feelings about digital technology remain the same now as teachers in training. IAPT 2 voiced. Past experiences were another area of interest for the participants. Two participants referred to the topic of experiences. IAPT 4 stated, "I am more open-minded about adopting new strategies even though it might be challenging." IAPT 8 noted, "I try to work with the new technology, and I feel that my previous experiences have motivated me to accept digital technology into my practice." An interpretation of the participants' responses may mean that the participants understand the need to learn about digital technology to deliver common education goals.

Related Theme 2: Professional Development. Professional development (PD) was another theme identified through the analysis of the data. All participants have indicated that PD training will enhance their technological skills within the classroom. IAPT 2, 5, 6, 9, and 10 elaborated about a holistic training program that appeals to all Indigenous Amerindian preservice teachers. From the verbatim remarks, there were several reasons why participants stress the training of digital technology. Five participants referred to professional development as their foundation for teaching. IAPT 2 stated, "We need to be technologically equipped as our counterparts around the country. When I return to my community, I can be an expert in digital technology." IAPT 5 noted, "I wanted to have a better grip of digital technology which would guarantee adequate skills for novice Indigenous Amerindian teachers." IAPT 6 stated, "I am open to learning more about

digital technology in workshops, and that would make me more aggressive towards digital technology." IAPT 7 indicated, "I don't think I can survive in a technological classroom without continuous training." IAPT 9 added that "The skills from PDs could enhance the general teacher training program. Specifically, IAPT 9 noted the relevance and application of PDs for multi-grade teaching, individual subjects, and specific grades. These perceptions for the overarching theme, professional development, are needed to speed up digital technology adoption that would improve the general pedagogical process.

Related Theme3: Perceptions. Perceptions were another common theme identified throughout the transcripts of the interview and the researcher's journal notes. As noted previously, all participants believe that perceptions are related directly to the adoption process of digital technology. IAPTs 1, 3,5, 7, and 9 discussed how their perceptions have altered throughout the face-to-face interview. They shared how the dept of their perceptions have triggered self-consciousness about the usefulness of digital technology. IAPT 2, 4 and 6 shared similar experiences by saying, "self-motivation is very helpful to integrate digital technology into the classroom," especially when working on difficult concepts, writing resource units, or have to meet the needs of learners in an inclusive setting. It was essential to recognize this interpretation of the research questions because it helps solidify the research on the hindrance towards technological adoption.

Summary

The study's key findings were based on three research questions and the emergent patterns from interview questions. Based on data collection, I concluded that significant results related to research question 1 were that Indigenous Amerindian preservice

teachers at the Professional Development Center found digital technology for the pedagogical process beneficial for gaining professional support for integrating technological tools despite the institution internal arrangement. For example, IAPTs often expressed the bureaucratic structure for technical support, including access to Wi-Fi, institutions' computers, and opportunities to utilize digital technology strategies. The key findings related to Research Question 2 was the majority of Indigenous Amerindian preservice teachers perceived that individuals, institutions, and the Ministry of Education are -contributors to the integration process of digital technology into the classroom. For example, IAPTs mentioned a lack of basic knowledge, administration, Ministry of Education, content alignment, social connections as contributors to intuitional conflicts as teachers embarked upon integrating digital technology during teaching practice. It lends itself to further breakdown in communication and delay of Indigenous Amerindian preservice teachers' adoption of digital technology. The participants are in full agreement that the Professional Development Center has not looked at training holistically. The key findings related to research question 3 were that IAPTs, motivational tools, professional development, working technological plan, and teacher preparedness support are integrating digital technology strategies into the pedagogical practices for the extension of training. For example, IAPTs often lamented on the importance of continuous professional guidance for trainers and trainees within the context of digital technology. Chapter 5 includes interpretations of the findings, limitations of the study, recommendations for future research, implications, and conclusions.

Chapter 5: Discussion, Conclusions and Recommendations

Introduction

The purpose of this basic qualitative study was to discover the perceptions of Indigenous Amerindian preservice teachers about digital technology integration in the classroom. In order to achieve this purpose, I explored three research questions focused on understanding the perceptions of Indigenous Amerindian preservice teachers on the integration of digital technology, as a pedagogical tool. This study was conducted to expand upon the adoption rate of digital technology among Indigenous Amerindian preservice teachers, as well as to determine if and how the rate of digital technology could have been improved and whether this innovation provided quality pedagogical strategies for Indigenous Amerindian preservice teachers to integrate within the classroom.

Interpretation of the Findings

The perceptions of Indigenous Amerindian preservice teachers about the low adoption of digital technology into the classroom were viewed through Roger's diffusion of innovation theory and Venkatesh and Davis' technology acceptance model (Venkatesh & Davis, 2000). Some of the findings from this study confirmed, disconfirmed, or extended the findings from the literature. I interpreted the results using research literature by research questions.

The first research question enquired about the Indigenous Amerindian preservice teachers' perceptions of the adoption of digital technology in their daily pedagogical practices. Indigenous Amerindian preservice teachers were asked to reflect on their

perception of teaching practice, their exposure to digital technology, and their implementation of digital technology while they were been trained. In this way, many findings confirmed the understanding of the research literature (Morrison et al., 2016). Additional findings extended understanding of the perceptions of integrating digital technology as interpreted below. The occurrence of replies for each emergent pattern for this research question is shown in Tables 2 and 3, with the majority of emergent patterns in alignment with the elements of the diffusion of innovation theory (DOI) and the technology acceptance model (TAM).

Perception of Digital Technology

Research Question 1: Upon inquiring about the Indigenous Amerindian preservice teachers' perceptions of the adoption of digital technology in their daily pedagogical practices, the key findings included the admission that IAPTs found that digital technology is a challenge for learners from remote, riverine areas since territorial separation had impinged on their ability to be a part of the mainstream education. The deficiency of research focused on the perceptions of Indigenous Amerindian preservice teachers and the low adoption of technology, especially the integration of digital technology into the classroom. The findings of this study confirmed, extended, and filled gaps in the published empirical research.

One conclusion which was drawn from the data which related to this research question was that Indigenous Amerindian preservice teachers found that using digital technology as a teaching tool is useful only if the training is provided for teachers to explore skills and strategies associated with the integration process. In a review of the

literature on the adoption of digital technology, the perspectives of Indigenous Amerindian preservice teachers were limited, especially for the pedagogical task. Indigenous Amerindian preservice teachers were accustomed to the social and cultural make-up of their communities (Lazar et al., 2020; Saritas & Kuzminov, 2017; Tissenbaum & Slotta, 2019). This was the primary practice in their methods in educating remote communities (Asino & Pulay, 2019; Elliot & Lashley, 2017; Huang & Liaw, 2018; Shamir, et al., 2018; Prayaga et al., 2017). In this study, Indigenous Amerindian preservice teachers' perceptions of digital technology are echoed across Rogers (2004b) diffusion of innovation theory, while participation in the training was shared, which fills gaps in the literature. In this current literature, Indigenous Amerindian preservice teachers' perceptions were shared about the benchmark for learning digital technology as a pedagogical tool. Indigenous Amerindian preservice teachers reported that in their communities, their classroom setting is not geared for the integration of digital technology.

Three studies which reported on community structure and educational involvement about Indigenous learners engagement in digital technology to bridge the educational gap at the Professional Development Center were researched (Blanc & Hammer, 2018; Rennie et al., 2018; Trimmer et al., 2018). These findings were concomitant with the findings of this study even though they are not based on the understanding of Indigenous Amerindian' preservice teachers' use of digital technology to develop skills at the individual and societal level (Jeong et al., 2019). My study confirms that Indigenous Amerindian preservice teachers knowledge of digital technology as a

teaching tool depends upon the quality of training from the available resources. Also, it extends the previous literature as Indigenous Amerindian preservice teachers discussed the adoption of digital technology as a teaching tool in order to strengthen the dynamics of the Indigenous Amerindian classroom. Additionally, in the literature, one study mentioned the empowerment of Indigenous preservice teachers with new teaching tools in conjunction with digital technology during the training of IAPTs to practice in the classroom (Dornan, 2019). The data from my study confirms that pedagogical structure is vital for Professional Development Centers to infuse so Indigenous Amerindian preservice teachers could develop knowledge and connect to digital technology in the classrooms.

Another conclusion from my study, which was addressed in Key Finding 1, was that Indigenous Amerindian preservice teachers found that learning and human resources for supporting institutional practices during the integration of digital technology were lacking. It may be due to the unstructured delivery of the Educational Technology course's content The literature revealed that resources provide Indigenous Amerindian preservice teachers the time to discover and explore opportunities to manipulate digital technology in the real-world (Jeong et al., 2019). My study confirms that resources are the means of persuading novice preservice teachers to embrace the practicality of digital technology as a pedagogical tool that restructured training. The literature outlines the utilization of Indigenous Knowledge as a precursor to capture Indigenous Amerindian' preservice teachers' interest in a pedagogical process and strengthen the adoptive rate of digital technology in real-time. Findings of my study confirm the integration of digital

technology and adds to that, the understanding of the gap through the perceptions of Indigenous Amerindian preservice teachers accepting digital technology in order to amplify great teaching.

The final conclusion drawn from key findings 1, is that Indigenous Amerindian preservice teachers were impacted by the teaching style and leadership qualities of their lecturers. Such demonstration provided strategies and skills for the teachers to engaged with aspects of digital technology to strengthen training. This was found not only to be pivotal for the success of adoption, but was confirmed and extended by the literature reviewed. The literature also highlighted training in the approach to digital technology (Hansen & Antsanen, 2016; Harrison, 2018; Jennings, 2020; Mangar, 2016; Spence, 2018). The findings of my study indicate that it might also be necessary that IAPTs who are engaged in digital technology practices to have a solid background in Technology. For example, current literature shared that self-discipline is an integral part of training which in itself, provides specific support for Indigenous Amerindian preservice teachers' and lecturers to be collaboratively engaged in meaningful technological practices (Granger, 2017a; Menezes, 2017) and allows for Indigenous Amerindian preservice teachers and lecturers to engage in technological applications (Gill, 2018; Priyadharshini et al., 2018) through meaningful training (Parkinson & Jones, 2018; Rennie et al., 2018) and curriculum inclusivity (Hall & Tandon, 2017). This highlighted a better understanding of the perception of Indigenous Amerindian preservice teachers, and brought clarity in planning while practicing the integration of digital technology in the

classroom. These were key components for adopting digital technology, as suggested by Rogers (2004b) diffusion of innovation.

Perceived Barriers

Research Question 2. dealt with the perceived barriers to the adoption of digital technology by Indigenous Amerindian preservice teachers at three different levels. The teachers were challenged individually, at the institutional level, and at the wider arm of the education sector as they explored and shared experiences associated with the integration process beyond the classroom. It may be due to the induction of digital technology by individual lecturers who appear to have limited knowledge of the process, Also the unstructured delivery of the Educational Technology course's content With a lack of previous research on perceived barriers by the Indigenous Amerindian preservice teachers, by utilizing Rogers (2016) DOI and Venkatesh and Davis (1986) TAM, my study contributes to a deeper understanding of barriers faced by Indigenous Amerindian preservice teachers in training and their willingness to be involved in the integration of technology in the classroom.One conclusion which came from the data related to this research question was that Indigenous Amerindian preservice teachers found that obstacles were authentic, and because they impinged on decisions for implementing digital technology, they were limited. Although researches report that IAPTs using digital technology while in training encountered obstacles like insufficient technology, content, poor administrative structure, and lack of resources (Redmond & Lock, 2019), IAPTs created plans to overcome obstacles to enable the successful integration of digital technology.

Perceived Coping Mechanism

Research Question 3: What are the perceived coping and adapting mechanisms used to overcome obstacles for the integration of digital technology by Indigenous Amerindian preservice teachers?

Key finding 3 from data confirmed the knowledge that Indigenous Amerindian preservice teachers found coping mechanisms to deal with the integration process of digital technology in the classroom (Gavaldon & McGarr, 2019). Participants' experiences also confirmed the research was indicating that Indigenous Amerindian preservice teachers are satisfied with the increase in the quality of the services for the adoption of digital technology (Mitchell et al., 2019). Every Indigenous Amerindian preservice teacher clarified strategies synthesized in the literature review, and this was confirmed by the findings from this study.

Teacher preparation emerged as a major sub-theme, with findings that extended the knowledge in the research literature. Indigenous Amerindian preservice teachers shared that once a coping mechanism was established, significant factors could be used to influence the analysis process. Several Indigenous Amerindian preservice teachers connected struggle and confusion to the integration process of technology. IAPT 1 noted, "The depth of orientation provided by the institution impacts my decision about integrating digital technology, not-with-standing my place of origin." When Indigenous Amerindian preservice teachers originate from areas where technology resources are scarce, they learn to modify tools in their instruction according to the unique needs of individual students, and learn to explore knowledge based on the removal of redundant

instructions in a gradual release of coping strategies, resulting in a collaborative approach to mitigate factors (Jongen et al., 2019).

Owing to the lack of research reflecting coping mechanisms, this researcher utilized Rogers DOI theory and Venkatesh and Davis TAM model (Davis, 1986; & Rogers, 2004b) to show that this study contributed to a new method of preparation for teaching. In the literature, emergent themes have not been previously identified. A plausible suggestion for this is that at the time of the study, the empirical literature on Indigenous Amerindian preservice teachers as digital adopters was not published. For example, early adopters focused on trigging the critical mass and maintaining communication when an innovation is adopted. As Rogers (2004b) shared, at the early majority level, the control for learning shifts from students to administration. When examining Key Results 3 through the lens of a novice indigenous teacher, at the time when the implementation of technology is at the highest, it may be aligned with code and practices of educating teachers who may connect to the emergent themes (Davis, 1986). The conclusion drawn from the data related to this research question was that Indigenous Amerindian preservice teachers at the Innovator's level found digital technology as being supportive of making instructional changes that have professional impacts when technology is used for the improvement of training. My study contributed to a new method of preparation for the usefulness of digital technology as a teaching tool in pedagogical practices Therefore, this study extended what was known about Indigenous Amerindian preservice teachers' perception of the adoption of digital technology into the classroom.

Limitations of the Study

Limitations to trustworthiness in this study were minimal, as I was able to implement all the planned strategies for credibility, transferability, dependability, and confirmability. However, some limitations inherent to the basic qualitative research design interview approach may have affected my study. In using a basic qualitative study design to gather data from groups of people to understand and interpret their perceptions (Merriam & Tisdell, 2016), this research design may have unexpected limitations. Data were limited to the perceptions that participants self-reported, instead of their actual behaviors (Yin, 2017). First, in my study, I acted as the data collection tool, and my bias towards the participants may have influenced the data collection process (Rubin & Rubin, 2012). To identify and mitigate this bias, I relied on feedback from my dissertation committee and conducted regular scrutiny in the research journal (Rubin & Rubin, 2012). Ongoing feedback from my dissertation committee made it possible for me to utilize interview techniques, including peer-reviewed interview questions and data analysis procedures, that minimized the impact of my bias during data collection and analysis.

Another limitation was related to the participants. First, during the recruitment phase of the procedure, accessibility to possible participants to enlist in the interview procedure came in phases due to the institution's policy to gain authorization to contact Indigenous Amerindian preservice teachers who met the inclusion criteria prior to distributing the information to me. Although all participants were ultimately contacted, on the spreadsheet, some participants received reminders via 'WhatsApp' before other participants received their first e-mail solicitation. Due to this unforeseen obstruction

during the recruitment process, most participants whose institution gave permission for their Indigenous Amerindian preservice teachers to be contacted earlier in the recruitment process were included in the interview procedure.

In Chapter 3, I described the techniques I used to address and relieve my likely inclination. The procedures I used were hypothetical triangulation, member checks, and intelligent journaling. I interviewed 10 Indigenous Amerindian preservice teachers in order to confirm and validate the transcriptions of the data analyzed. During data investigation, I utilized triangulation with two conceptual structures, Rogers (2004b) DOI and Davis (1986) TAM. By utilizing the structures, I had the option to direct a more profound information examination while looking at the information through two distinct focal points, which diminished the effects my own inclinations had on the investigation.

I also utilized reflective journaling to minimize presumptions about the information and to scrutinize my interpretations in comparison to the conceptual frameworks. Another limitation of my study was related to the impediment of time. The Indigenous Amerindian preservice teachers who took an interest in my study were engaged in exploring practicum experiences. After two months, they returned to the classroom on the college campus, and I was able to complete the interviews for this study. This variance in time may have resulted in them having forgotten some past experiences based on their current experiences during their participation at the training institution for the integration of digital technology

Recommendations

Recommendations for further research are based on study results and limitations of the study. As my study was one of the first to examine Indigenous Amerindian preservice teachers' perceptions about the integration of digital technology, I recommend that additional studies with Indigenous Amerindian preservice teachers are conducted to confirm and/or disconfirm the findings. In addition to further exploring Indigenous Amerindian preservice teachers' viewpoints, I recommend that studies on this topic be conducted with Indigenous Amerindian inservice teachers to gather viewpoints on the adoption of digital technology beyond the classroom. Therefore, more research is needed to be conducted for the low adoption of digital technology, and to build a deeper understanding of Indigenous Amerindian' preservice teachers' perceptions about the adoption of digital technology for pedagogical growth and professionalism within the education system.

Another recommendation is related to Research Question 2 and the research design utilized in my study. With my study, the use of a basic qualitative research design was to capture the perceptions of Indigenous Amerindian preservice teachers on the low adoption of digital technology and not on the scrutiny of a "phenomenon in depth and within its real-world context" (Yin, 2017, p. 16) or to contribute an "elaborate and copious history concerning a body, system or program" (Patton, 2015, p. 259). Moreover, after conducting my study and learning about the barriers, the level at which Indigenous Amerindian preservice teachers adopt digital technology and what impacts their perceptions for integrating digital technology into pedagogical practices have on the

education process, I recommend that a richer story about those perceptions be examined. This should be done through a case study research design with the Indigenous Amerindian preservice teachers' population at the training institution, in order to gain practical insight into Indigenous preservice teachers' perceptions. I recommend that in addition to gaining practical insight pertaining to capturing Indigenous Amerindian preservice teachers' perceptions that future studies examine categories of barriers to provide a new body of knowledge about the low adoption of digital technology for pedagogical practices.

Another recommendation is related to the key findings linked to research question 3. Prior to conducting this study, no conceptual framework explored the perception of Indigenous Amerindian preservice teachers' low adoption of digital technology. Based on what was learned during this study, I recommend that additional studies explore Rogers (2004b) DOI and Venkatesh and Davis (1986) TAM separately in order to get a deeper perspective of Indigenous Amerindian preservice teachers' ability to adopt digital technology as a pedagogical tool. Therefore, more research needs to be done using the conceptual frameworks as distinct and collective elements at the institutional level to gain a deeper understanding of Indigenous Amerindian preservice teachers' low adoption of digital technology and mechanisms to overcome obstacles beyond training. Additionally, I recommend further research be done with Indigenous Amerindian preservice teachers who are currently receiving training to integrate digital technology into the classroom. As my study showed, the low adoption of digital technology can impinge on Indigenous Amerindian preservice teachers' ability to embrace changes when faced with new

pedagogical tools. With this in mind and knowing that there is a need for understanding the low adoption of digital technology, further research should focus on modified support through digital technology for pedagogical changes.

The last recommendation is related to the limitations of my study. The study was conducted with Indigenous Amerindian preservice teachers at a Professional Development Center in Guyana. Therefore, this study should be replicated using Indigenous Amerindian preservice teachers from the coastal communities of Guyana as the subject of study to determine whether the results would be similar. In expansion, of the fact that I reached saturation with the 10 Indigenous Amerindian preservice teachers interviewed, I would recommend conducting this study with a larger sample size and conduct a second round of interviews with participants from the Satellite Development Centers throughout the Coastal Plain of Guyana to gain a deeper understanding about the low adoption of digital technology as an academic tool.

Implications

My study may contribute to positive social change in several ways, including at the institutional, societal, and individual levels. Firstly, at the institutional level, the findings of my study may contribute to positive social change through improved pedagogical practices. The study indicates Indigenous Amerindian preservice teachers found the adoption of digital technology tedious even though it is useful for professional growth and improvement of pedagogical practices beyond the institution. Synonymous with previous empirical research, my study determines the practicality of providing operative training for trainers and trainees. Through some degree of Indigenous

Amerindian preservice teachers' professional exposures and perceptions, the findings of my study also highlight the importance of providing access to digital technology and support with technological plans when instituting new pedagogical tools within the curriculum. Education stakeholders at regional levels who are looking to reduce the educational gap and improve learning in the school systems should seek continuous professional development, create support based on digital technology where Indigenous Amerindian teachers are placed to provide learning.

Another contribution and implication of my study is that it may provide a more in-depth understanding of the low adoption of digital technology at the societal level. Research in Indigenous education has indicated the growing need for digital technology to support sustainable educational development (Gumbo, 2020); however, prior to embarking on this study, little was known about the low adoption of digital technology for pedagogical practices with regard to Indigenous Amerindian preservice teachers in training. Although this particular study focuses primarily on the perceptions of Indigenous Amerindian's low adoption of digital technology and how it can be integrated as a form of pedagogical practices, technological network may serve as a conduit for providing Indigenous Amerindian preservice teachers' support to integrate digital technology in teaching across the regions. An increasing number of regional education officers, school leaders, and community leaders may help to provide training for the integration of digital technology in classrooms throughout Guyana.

At the individual level, the findings of my study may contribute to positive social changes by addressing the adoption of digital technology as teaching tools for learning

integration for Indigenous Amerindian preservice teachers. The findings specify that digital technology may be beneficial support for engaging Indigenous Amerindian preservice teachers in the context of learning beyond the classroom. In earlier empirical research on different types of digital technology, little information is given on the perceptions of Indigenous Amerindian preservice teachers' adoption of digital technology in relation to the training. The viewpoints shared by Indigenous Amerindian preservice teachers in my study indicate that adequate professional development and support may serve as a valuable education tool to transform learning beyond 'one-size-fits-all' training for the integration of digital technology in the curriculum. These discoveries may have organizational as well as societal impacts.

Conclusion

The problem related to this study was that the low adoption of digital technology in the pedagogical practice among Indigenous Amerindian preservice teachers was not understood. In this basic qualitative study, a variety of factors and interventions were explored to obtain a deeper understanding of the complex process of preparing Indigenous Amerindian preservice teachers increasing the rate of adoption of digital technology in the field of teacher training. The results of data collected for this study yielded 17 themes. Ten of which explicitly related to the preparation of Indigenous Amerindian preservice teachers and five related to the conditions necessary to impact the adoption rate of digital technology at the (training) institutional, individual and societal level. The key finding for this basic qualitative study was that Indigenous Amerindian preservice teachers could be budding adopters of the educational transformation that is

needed to fully integrate digital technology into pedagogical practices and beyond the classrooms.

As Scherer et al. (2018) indicated, it is essential that preservice teachers be trained to acquire 21st-century skills and strategies for integrating digital technology. This study has supported the theory that digital technology can no longer be simply viewed as a personal communication tool, or browsing the web, but must be viewed as useful for Indigenous Amerindian preservice teachers to attain professional guidance and support for integrating instructional tools and strategies for meaningful training practices, of closing the educational gap. Evidence further revealed that the intensive training, which was posited as a boost to teachers' confidence when teaching preservice Indigenous Amerindian learners, provided a platform for positive social change from which policymakers and stakeholders can formulate a much-needed plan of integration. Hence, the growing concern surrounding learning among Indigenous populations which existed as the conception of the study and which in fact still exist today in Guyana, is a very fertile ground for the exploration to conduct similar justifiable endeavors in the field of educational research.

References

Adhabi, E., & Anozie, C. B. (2017). Literature review for the type of interview in qualitative research. *International Journal of Education*, *9*(3), 86-97. https://doi.org/10.5296/ije.v9i3.11483

Adhikari, L., Shrestha, A. J., Dorji, T., Lemke, E., & Subedee, B. R. (2018). Transforming the lives of mountain women through the Himalayan nettle value chain: a case study from Darchula, far west Nepal. *Mountain Research and Development*, *38*(1), 4-14. https://doi.org/10.1659/MRD-JOURNAL-D-17-00074.1

Adnan, H. R., Hidayanto, A. N., Purwandari, B., Kosandi, M., Fitriani, W. R., & Kurnia, S. (2019). Multi-Dimensional Perspective on Factors Influencing Technology Adoption for Open Government Initiatives: A Systematic Literature Review. In *2019 International Conference on Advanced Computer Science and information Systems (ICACSIS)* (pp. 369-374). IEEE.10.1109/ICACSIS47736.2019.8979924

Akçayır, M., & Akçayır, G. (2017). Advantages and challenges associated with augmented reality for education: A systematic review of the literature. *Educational Research Review*, 20, 1-11. http://www.cs.ucf.edu/courses/cap6121/spr17/readings/ARLit.pdf

Alam, K., Erdiaw-Kwasie, M. O., Shahiduzzaman, M., & Ryan, B. (2018). Assessing regional digital competence: Digital futures and strategic planning implications. *Journal of rural studies*, *60*, 60-69.

https://doi.org/10.1016/j.jrurstud.2018.02.009

Alase, A. (2017). The interpretative phenomenological analysis (IPA): A guide to a good qualitative research approach. *International Journal of Education and Literacy Studies*, *5*(2), 9-19. doi: 10.7575/aiac.ijels.v.5n.2p.9

Allen, J. P. (2017). *Technology and inequality*: *Concentrated wealth in a digital world*. Cham, Switzerland: Palgrave Macmillan. Allender, T., Clark, A., & Parkes, R. (Eds.). (2019). *Historical Thinking for History Teachers: A new approach to engaging students and developing historical consciousness*. Routledge

Allender, T., Clark, A., & Parkes, R. (2019). Historical thinking in the Australian classroom. *Teaching History*, *53*(1), 39. https://search.informit.com.au/documentSummary;dn=352075696740275;res=IELHSS> ISSN: 0040-0602

Al Salami, M. K., Makela, C. J., & de Miranda, M. A. (2017). Assessing changes in teachers' attitudes toward interdisciplinary STEM teaching. *Int J Technol Des Educ* 27**,** 63–88 (2017). https://doi.org/10.1007/s10798-015-9341-0

Alvesson, M., & Sköldberg, K. (2017). *Reflexive methodology: New vistas for qualitative research*. Sage. Publication. Inc.

Amador, J. M., Kimmons, R., Miller, B. G.,Desjardins, C. D., & Hall, C. (2019). Preparing preservice teachers to become self-reflective of their technology integration practices. In *Preservice and In-Service Teacher Education: Concepts, Methodologies, Tools, and Applications* (pp. 1298-1325). IGI Global. DOI: 10.4018/978-1-5225-7305-0.ch060

Aman, R. (2017). Colonial Differences in Intercultural Education: on interculturality in the Andes and the decolonization of intercultural dialogue. *Comparative Education Review*, *61*(S1), S103-S120.

Amerindian Act. (2006). Guyana ACT No. 6 of 2006 Amerindian ACT 2006. Retrieved from http://parliament.gov.gy/documents/acts/4680-act_no_6_of_2006.pdf

Anand, A., Singhal, S., & Singh, O. (2018). SDE based generalized innovation diffusion modeling. *International Journal of Mathematical, Engineering and Management Sciences,4*(3) 697-707. doi: 10.33889/IJMEMS.2019.4.3-055

Anderson, P. J., Rennie, J., White, S., & Darling, A. (2019). *Improving Teacher Education for Better Indigenous Outcomes: PREEpared - Partnering for Remote Education ander Experience*. Department of Education and Training. https://ltr.edu.au/resources/SD15-5215_FinalReport_PREEpared_Anderson_2019.pdf

Anderson, R. K., Boaler, J., & Dieckmann, J. A. (2018). Achieving elusive teacher change through challenging myths about learning: A blended approach. *Education Sciences*, *8*(3), 98. https://doi.org/10.3390/educsci8030098

Ankiah-Gangadeen, A., & Nadal, P. (2018). Relocating social justice in the policy-pedagogy research nexus: Insights from the Mauritian language-in-education policy. Paper presented at the South African Educational Research Association Conference, Pretoria, South Africa, *1*(31)22–24 https://doi.org/10.1007/978-981-13-3309-5_54-1

Asiama, K., Bennett, R., & Zevenbergen, J. (2017). Participatory land administration on

customary lands: A practical VGI experiment in Nanton, Ghana, *International Journal of Geo-Information, 6*(7), 186.doi: 10.3390/ijgi6070186.

Asino, T. I., & Pulay, A. (2019). Student perceptions on the role of the classroom environment on computer Supported collaborative learning. *TechTrends, 63*(2), 179-187 https://doi.org/10.1007/s11528-018-0353-y

Ávila, L. V., Beuron, T. A., Brandli, L. L., Damke, L. I., Pereira, R. S., & Klein, L. L. (2019). Barriers to innovation and sustainability in universities: an international comparison. *International Journal of Sustainability in Higher Education.* ", *International Journal of Sustainability in Higher Education*, 20(5), 805-821. https://doi.org/10.1108/IJSHE-02-2019-0067

Awofala, A. O., Olabiyi, O. S., Ogunleye, A., Udeani, U. N., & Fatade, A. O. (2017). School administrators' perceptions of the employability of preservice science, technology, and mathematics teachers through teaching practice in Nigeria. *International Journal of Research in Education and Science, 3*(1), 42-55.

Baeza, A. (2017). One Local Dimension of a Global Project: The Introduction of the Monitorial System of Education in Post-Independent Chile, 1821–1833. *Bulletin of Latin American Research, 36*(3), 340-353. https://doi.org/10.1111/blar.12483

Balbay, S., & Erkan, G. (2018). Perceptions of instructors on using web 2.0 tools in academic english courses. *International Journal of Curriculum and Instruction, 10*(2), 45-60. http://ijci.wcci-international.org/index.php/IJCI/article/view/173/71

Barnidge, E., Stenmark, S., & Seligman, H. (2017). Clinic-to-community models to address food insecurity. *JAMA pediatrics*, *171*(6), 507-508. https://researcherprofiles.org/profile/7220789

Bashan, B., & Holsblat, R. (2017). Reflective journals as a research tool: The case of student teachers' development of teamwork. *Cogent Education*, *4*(1), 1374234. https://doi.org/10.1080/2331186X.2017.1374234

Bates, C. (2017). Some Thoughts on the Representation and Misrepresentation of the Colonial South Asian Labour Diaspora, South Asian Studies, 33:1, 7-22, DOI: 10.1080/02666030.2017.1300372

Bayeh, E. (2016). The role of empowering women and achieving gender equality to the sustainable development of Ethiopia. *Pacific Science Review B: Humanities and Social Sciences*, 2(1), 37-42 https://doi.org/10.1016/j.psrb.2016.09.013

Beach, D., Johansson, M., Öhrn, E., Rönnlund, M., & Per-Åke, R. (2019). Rurality and education relations: Metro-centricity and local values in rural communities and rural schools. *European Educational Research Journal*, *18*(1), 19-33. https://doi.org/10.1177/1474904118780420

Beaton, B., & Carpenter, P. (2016). Digital technology innovations in education in remote first nations.*IN Education*, *22*(1). Retrieved from http://ineducation.ca/ineducation/article/view/266/847

BECTA. (2017). A review of the research literature on barriers to the uptake of ICT by teachers. *International Journal of Education & Literacy Studi*es *3*(2) 26-31 http://hdl.handle.net/10760/28574

Berardinelli, A. L. (2017). Judicial activism in Brazil's constitutional court: Studies in the recognition of Brazilian indigenous tenure rights. *Udayana Journal of Law and Culture, 1*(1), 1-15 https://doi.org/10.24843/UJLC.2017.v01.i01.p01

Bischof, C. (2019). Liberal subjects: elementary education and native agency in the British West Indies, c. 1834–1860. *Slavery & Abolition*, *40*(4), 750-773. https://doi.org/10.1080/0144039X.2019.1591699

Black, G. L., & Hachkowski, C. (2018). Indigenous learners: what university educators need to know. *Journal of Further and Higher Education*, *43*(8) 1092-1108. https://doi.org/10.1080/0309877X.2018.1450495

Blades, D., & Mcivor, O. (2017). Science Education and Indigenous Learners. In: Taber K.S., Akpan B. (eds) Science Education. New Directions in Mathematics and Science Education. Sense Publishers, Rotterdam. https://doi.org/10.1007/978-94-6300-749-8_34

Blair, G., Littman, R., & Paluck, E. L. (2019). Motivating the adoption of new community-minded behaviors: An empirical test in Nigeria. *Science advances*, *5*(3), eaau5175. DOI: 10.1126/sciadv.aau5175

Blanc, H., & Hammer, J. S. (2018). The last of the lost generations? Formal and non-formal education in Ghana during times of economic decline and recovery. http://ftp.iza.org/dp11513.pdf.Blair, G., Littman, R., & Paluck, E. L. (2019). Motivating the adoption of new community-minded behaviors: An empirical test in Nigeria. *Science advances*, *5*(3), eaau5175.doi. 10.1126/sciadv.aau5175

Bloomberg, L. D., & Volpe, M. (2017). *Completing your qualitative dissertation: A*

roadmap from beginning to end. Thousand Oaks, CA: SageBolkan, S., Griffin, D. J., & Goodboy, A. K. (2018). Humor in the classroom: The effects of integrated humor on student learning. *Communication Education*, *67*(2), 144-164. https://doi.org/10.1080/03634523.2017.1413199

Brandt, C. J., Clemensen, J., Nielsen, J. B., & Søndergaard, J. (2018). Drivers for successful long-term lifestyle change, the role of e-health: a qualitative interview study. *BMJ open*, *8*(3), e017466. doi: 10.1136/bmjopen-2017-017466

Bullen, J., & Roberts, L. (2018). Driving transformative learning within Australian indigenous studies. *The Australian Journal of Indigenous Education*, *1*(12). 27-30. https://doi.org/10.1017/jie.2017.40

Burden, K., & Hopkins, P. (2017). Barriers and challenges facing pre-service teachers use of mobile technologies for teaching and learning. In blended learning: concepts, methodologies, tools, and applications. International Journal of Mobile and Blended Learning,*8(2)*1665-1686. doi: 10.4018/IJMBL.2016040101

Bureau of Statistics. (2018). Better data better lives. Guyana labor force survey. https://statisticsguyana.gov.gy/

Burroughs, J. (2017). Three factors leading to the failure of communications in emergency situations. (Doctoral dissertation). Available from ProQuest Dissertation and Theses @Walden University (UMI No 1028282)

Cai, Z., He, Z., Guan, X., & Li, Y. (2018). Collective data-sanitization for preventing sensitive information inference attacks in social networks. IEEE Transactions on Dependable and Secure Computing, 15(4), 577-590.

DOI:10.1109/TDSC.2016.2613521

Canals, L., & Al-Rawashdeh, A. (2019). Teacher training and teachers' attitudes towards educational technology in the deployment of online English language courses in Jordan. *Computer Assisted Language Learning*, *32*(7), 639-664. https://doi.org/10.1080/09588221.2018.1531033

Cardullo, V. M., Wilson, N. S., & Zygouris-Coe, V. I. (2018). *Enhanced student engagement through active learning and emerging technologies. In Student Engagement and Participation: Concepts, Methodologies, Tools, and Applications* (399-417). IGI Global. DOI: 10.4018/978-1-5225-3417-4.ch058.

Caribbean Community. (2018). Communiqué issued at the conclusion of the thirty-seventh regular meeting of the conference of heads of government of the caribbean community. Retrieved from http://caricom.org/media-center/communications/communiques/communique-issued-at-the-conclusion-of-the-thirty-seventh-regular-meeting-of-the-conference-of-heads-of-government-of-the-caribbean-community-caricom-4-6-july-2016-georgetown-guyana

Caron, J., Asselin, H., Beaudoin, J. M., & Muresanu, D. (2019). Promoting perceived insider status of indigenous employees. *Cross Cultural & Strategic Management*. https://www.emerald.com/insight/publication/issn/2059-5794

Castagno, A. E., Garcia, D. R., & Blalock, N. (2016). Rethinking school choice: educational options, control, and sovereignty in Indian country. *Journal of School Choice, 10*(2), 227-248.doi: 10.1080/15582159.2016.1153379

Chance, S. M., Williams, B., Goldfinch, T., Adams, R. S., & Fleming, L. N. (2019).

Guest Editorial Special Issue on Using Enquiry-and Design-Based Learning to Spur Epistemological and Identity Development of Engineering Students. *IEEE Transactions on Education*, *62*(3), 157-164

Chang, Y. W., & Hsu, P. Y. (2019). An empirical investigation of organizations' switching intention to cloud enterprise resource planning: a cost-benefit perspective. *Information Development*, *35*(2), 290-302. https://doi.org/10.1177/0266666917743287

Chappell, K., Hetherington, L., Keene, H. R., Wren, H., Alexopoulos, A., Ben-Horin, O., Nikolopoulos, K, Robberstad, J, Sotirou,F. & Bogner, F. X. (2019). Dialogue and materiality/embodiment in science| arts creative pedagogy: Their role and manifestation. *Thinking Skills and Creativity*, *31*, 296-322.doi.org/10.1016/j.tsc.2018.12.008

Chase, E. (2017). Enhanced Member Checks: Reflections and Insights from a Participant-Researcher Collaboration. *The Qualitative Report*, *22*(10), 2689-2703. https://nsuworks.nova.edu/tqr/ vol22/iss10/11

Choung, C., & Manamela, M. G. (2018). Digital inequality in rural and urban settings: challenges of education and information in South African youth context *Bangladesh e-Journal of Sociology,15*(2), 186-197. DOI: 10.1162/asep.2005.4.3.116

Chuks, O. (2017). Exploring the Urban Digital Divide in Kigali: Spatial Analysis and Institutional Adaptation. (Doctoral Dissertation Twente). https://pdfs.semanticscholar.org/f9a9/d08a3f96e5f4e1eaeecf5f2689a3d918d7a3.p

df

Claessens, L. C., van Tartwijk, J., van der Want, A. C., Pennings, H. J., Verloop, N., den Brok, P. J., & Wubbels, T. (2017). Positive teacher–student relationships go beyond the classroom; problematic ones stay inside. *The Journal of Educational Research*, *110*(5), 478-493. https://doi.org/10.1080/00220671.2015.1129595

Clark-Gordon, C. V., Bowman, N. D., Hadden, A. A., & Frisby, B. N. (2019). College instructors and the digital red pen: An exploratory study of factors influencing the adoption and non-adoption of digital written feedback technologies. *Computers & Education*, 128, 414-426.

Connelly, L. M. (2016). Trustworthiness in qualitative research. *MedSurg Nursing*, *25*(6), 435-437.

Constantinou, C. S., Georgiou, M., & Perdikogianni, M. (2017). A comparative method for themes saturation (CoMeTS) in qualitative interviews. *Qualitative Research*, *17*(5), 571-588. https://doi.org/10.1177/1468794116686650.

Creswell, J. W., & Poth, C. N. (2017). *Qualitative inquiry and research design: Choosing among five approaches*. Sage publications.

Cummings, C., Mason, D., Shelton, K., & Baur, K. (2017). Active learning strategies for online and blended learning environments. In *Flipped Instruction: Breakthroughs in Research and Practice* (88-114). IGI Global. DOI: 10.4018/978-1-5225-1803-7.ch006.

Daher, M., Olivares, H., Carré, D., Jaramillo, A., & Tomicic, A. (2017). Experience and meaning in qualitative research: A conceptual review and a methodological

device proposal. In *Forum Qualitative Sozialforschung/Forum: Qualitative Social Research, 18*(3), 1-25. https://doi.org/10.17169/fqs-18.3.2696

Darling-Aduana, J., & Heinrich, C. J. (2018). The role of teacher capacity and instructional practice in the integration of educational technology for emergent bilingual students. *Computers & Education, 126,* 417-432. https://doi.org/10.1016/j.compedu.2018.08.002

Datta, R. K. (2018). Rethinking environmental science education from indigenous knowledge perspectives: an experience with a Dene First Nation community. *Environmental Education Research*, 24(1), 50-66. https://doi.org/10.1080/13504622.2016.1219980.

Davis, B. A., & Lundgren, L. (2019). Global Broadcasting in the Digital Age. *Global Communication: A Multicultural Perspective*, 179.

Davis, F. D. (1986). A technology acceptance model for empirically testing new end-user information systems: Theory and results. Massachusetts, United States: Sloan School of Management, Massachusetts Institute of Technology. http://hdl.handle.net/1721.1/15192

Delany, C., Doughney, L., Bandler, L., Harms, L., Andrews, S., Nicholson, P., & Ewen, S. (2017). Exploring learning goals and assessment approaches for Indigenous health education: a qualitative study in Australia and New Zealand. *Higher Education*, *75*(2), 255-270. Doi:10.1007/s10734-017-0137-x

Ding, A. C. E., Ottenbreit-Leftwich, A., Lu, Y. H., & Glazewski, K. (2019). EFL teachers' pedagogical beliefs and practices with regard to using

technology. *Journal of Digital Learning in Teacher Education*, *35*(1), 20-39.doi.org/10.1080/21532974.2018.1537816

Dornan, I. (2019). 'Book don't feed our children': Nonconformist missionaries and the British and Foreign School Society in the development of elementary education in the British West Indies before and after emancipation. *Slavery & Abolition*, *40*(1), 109-129. https://doi.org/10.1080/0144039X.2018.1505144.

Dreamson, N., Thomas, G., Lee -Hong, A., & Kim, S. (2016). Culturally-inclusive-learning-for-indigenous-students-in-a-learning-management-system-LMS. Make tomorrow better. Retrieved from file:///C:/Users/ato2341/3D%20Objects/Culturally-Inclusive-Learning-for-Indigenous-Students-in-a-Learning-Management-System-LMS.pdf

Drijvers, P., Monaghan, J., Thomas, M., & Trouche, L. (2017). *Use of Technology in Secondary Mathematics:* Final Report for the International Baccalaureate. [Research Report] International Baccalaureate. <hal-01546747. https://hal.archives-ouvertes.fr/hal-01546747/document.

Elbaz, F. (2018). *Teacher thinking: A study of practical knowledge*. Routledge.

Ellerbrock, C. R., Cruz, B. C., Vásquez, A., & Howes, E. L. (2016). Preparing culturally responsive teachers: Effective practices in teacher education. *Action in Teacher Education, 38(3), 226-239.doi:* 10.1080/01626620.2016.1194780.

Elliot, V., & Lashley, L. (2017). The effectiveness of Interactive Radio Instruction (IRI) within selected primary schools in region number four (4). *Social Science Learning Education Journal*, *2*(9). doi: http://dx.doi.org/10.15520/sslej.v2i9.38

Elliott, S., & Davis, J. M. (2018). Challenging Taken-for-Granted Ideas in Early Childhood Education: A Critique of Bronfenbrenner.Ts Ecological Systems Theory in the Age of Post-humanism. Springer International Handbooks of Education, https://doi.org/10.1007/978-3-319-51949-4_60-2

Ennis, G. (2019). *Remediating Endangerment: Radio and the Animation of Memory in the Western Amazon* (Doctoral dissertation). http://hdl.handle.net/2027.42/151586

Evers, A. T., van der Heijden, B. I., Kreijns, K., & Vermeulen, M. (2016). Job demands, job resources, and flexible competence: the mediating role of teachers' professional development at work. *Journal of Career Development*, *43*(3), 227-243.

Ezedike, E. U. (2019). Multi-Culturalism in Education: A Critical Assessment of the Impact of Colonization and Globalization on Indigenous Africa Values. *AFRREV IJAH: An International Journal of Arts and Humanities, 8*(2), 11-17.DOI: http://dx.doi.org/10.4314/ijah.v8i2.2

Farjon, D., Smits, A., & Voogt, J. (2019). Technology integration of pre-service teachers explained by attitudes and beliefs, competency, access, and experience. *Computers & Education*, *130*, 81-93. https://doi.org/10.1016/j.compedu.2018.11.010

Fier, D. L., & Auld, M. C. (2017). The Effect of Indian Residential Schools on Height and Body Mass Post-1930. University of Victoria 1-47. https://www.uvic.ca/socialsciences/economics/assets/docs/discussion/DDP1703.p

Fitznor, L. (2019). Indigenous Education: Affirming Indigenous Knowledges and

Languages from a Turtle Island Indigenous Scholar's Perspective: Pikiskēwinan (Let Us Voice). In *Perspectives on Indigenous writing and literacies* (pp. 29-66). Brill. https://doi.org/10.1163/9789004298507_004.

Fleming, M. J., & Grace, D. M. (2017). Beyond aspirations: addressing the unique barriers faced by rural Australian students contemplating university. *Journal of Further and Higher Education*, *41*(3), 351-363. https://doi.org/10.1080/0309877X.2015.1100718

Fogarty, W., Lovell, M., Langenberg, J., & Heron, M. J. (2018). Deficit discourse and strengths-based approaches: changing the narrative of Aboriginal and Torres Strait Islander health and wellbeing. *Deficit Discourse and Strengths-based Approaches: Changing the Narrative of Aboriginal and Torres Strait Islander Health and Wellbeing*, viii. https://ncis.anu.edu.au/_lib/doc/ddih/Deficit_Discourse_and_Strengths-based_Approaches_FINAL_WEB.pdf

Foulger, T. S., Wetzel, K., & Buss, R. R. (2019). Moving toward a technology infusion approach: Considerations for teacher preparation programs. *Journal of Digital Learning in Teacher Education*, *35*(2), 79-91.https://doi.org/10.1080/21532974.2019.1568325

Friedmann, J. (2018). *The active community: toward a political-territorial framework for rural development in Asia*. *In Life Space and Economic Space* (. 216-247). Routledge.

Galla, C. K. (2018). Digital realities of Indigenous language revitalization: A look at

Hawaiian language technology in the modern world. *Language and Literacy*, *20*(3), 100-120. https://doi.org/10.20360/langandlit29412

Gamage, S., & Tanwar, T. (2017). Strategies for training or supporting teachers to integrate technology into the classroom. Strategies for training or supporting teachers to integrate technology into the classroom. Retrieved from http://r4d.dfid.gov.uk/

Gavaldon, G., & McGarr, O. (2019). Exploring pre-service teachers' future intentions to use technology through the use of comics. *Teaching and Teacher Education*, *83*, 99-109. https://doi.org/10.1016/j.tate.2019.04.004

Gbongli, K., Xu, Y., & Amedjonekou, K. M. (2019). Extended Technology Acceptance Model to predict mobile-based money acceptance and sustainability: a multi-analytical structural equation modeling and neural network approach. *Sustainability*, *11*(13), 3639. https://doi.org/10.3390/su11133639.

Geng, J., Jong, M. S. Y., & Chai, C. S. (2019). Hong Kong teachers' self-efficacy and concerns about STEM education. *The Asia-Pacific Education Researcher*, *28*(1), 35-45. https://doi.org/10.1007/s40299-018-0414-1

Genger, P. (2018). "The British Colonization of Australia: An Exposé of the Models, Impacts and Pertinent Questions," Peace and Conflict Studies: 25(1), Article 4. Available at: https://nsuworks.nova.edu/pcs/vol25/iss1/4

Gill, B. I. (2018). *The Role of Christ and the Black Church as Central Agents in Parenting Urban Black Students Toward School Success* (Doctoral dissertation, The Claremont Graduate University).

Gillan, K., Mellor, S., & Krakouer, J. (2017). *The Case for Urgency: Advocating for Indigenous voice in education*. *Australian Council for Educational Research,* 9781742864792. https://www.acer.org/au/aer

Gillan, K. P., Mellor, S., & Krakouer, J. (2017). The case for urgency: Advocating for Indigenous voice in education. https://research.acer.edu.au/aer/16/

Girardi, P., & Chiagouris, L. (2018). The digital marketplace: early adopters have changed. *Journal of Marketing Development and Competitiveness*, *12*(1), 84-95. DOI: https://doi.org/10.33423/jmdc.v12i1.1412.

Goktas, Y., Yildirim, S., & Yildirim, Z. (2016). Main barriers and possible enablers of icts integration into pre-service teacher education programs. *Educational Technology & Society*, *12*(1), 193–204. https://www.learntechlib.org/p/75176/.

Góngora-Mera, M. (2017). *Transregional Articulations Of Law And Race In Latin America*: A legal genealogy of inequality. In *Global Entangled Inequalities* (42-58). Routledge.

Granger, D. (2019b). Education is the key to empowerment and development. Public information Guyana. https://dpi.gov.gy/educa+tion-is-key-to-employment-and-development/

Granger, L. A. (2017a). Encouraging the Use and Activation of Heritage Languages in the Broader Educational System. In Trifonas, P. P., & Aravossitas, T. (Eds.). *Handbook of research and practice in heritage language education*. Springer International Publishing. Handbooks of Education. Springer, Cham. doi https://doi.org/10.1007/978-3-319-44694-3_16

Grant, S. (2016). From reconciliation to rights: Shaping a bigger Australia. Paper presented at the Wallace Wurth Lecture. Sydney, NSW: UNSW. https://newsroom.unsw.edu.au/stan-grant-wallace-wurthlecture-reconciliation-rights

Greenhow, C., & Askari, E. (2017). Learning and teaching with social network sites: A decade of research in K-12 related education. *Education and information technologies*, *22*(2), 623-645.doi: https://doi.org/10.1007/s10639-015-9446-9

Griffith, G. (2018). '*This is London calling the West Indies': the BBC's Caribbean voices. In West Indian Intellectuals in Britain*. Manchester University Press.

Guenther, J., Osborne, S., Arnott, A., & McRae-Williams, E. (2017). Hearing the voice of remote Aboriginal and Torres Strait Islander training stakeholders using research methodologies and theoretical frames of reference. *Race Ethnicity and Education*, *20*(2), 197-208. https://doi.org/10.1080/13613324.2015.1110294.

Guest, G., Namey, E., & McKenna, K. (2017). How many focus groups are enough? Building an evidence base for nonprobability sample sizes. *Field methods*, *29*(1), 3-22. https://doi.org/10.1177/1525822X16639015.

Guetterman, T. C. (2017). What distinguishes a novice from an expert mixed methods researcher? *Quality & Quantity*, *51*(1), 377-398.doi: https://doi.org/10.1007/s11135-016-0310-9

Gumbo, M. T. (2020). Teaching Food Technology in a Secondary Technology Education Classroom: Exploring Ideas in Indigenous Contexts. In *Food Education and Food Technology in School Curricula* (283-295). Springer, Cham.

Gyamfi, S. A. (2017). Preservice teachers' attitude towards information and communication technology usage: *International Journal of Education and Development using Information and Communication Technology*, *13*(1), 52-69. https://eric.ed.gov/?id=EJ1142267

Habiyaremye, A., Kruss, G., & Booyens, I. (2019). Innovation for inclusive rural transformation: the role of the state. *Innovation for development*, 1-14. DOI:10.1080/2157930X.2019.1596368

Halili, S. H., & Sulaiman, H. (2017). Exploring the use of information and communications technology (ict) in education for adolescents in urban poverty. *The Online Journal of Distance Education and e-Learning*, *4*(2), 31. https://doi.org/10.1016/j.kjss.2017.12.022

Hall, B. L., & Tandon, R. (2017). Decolonization of knowledge, epistemicide, participatory research and higher education. *Research for all*, *1*(1), 6-19. https://doi.org/10.18546/RFA.01.1.02

Hamidi, H., & Chavoshi, A. (2018). Analysis of the essential factors for the adoption of mobile learning in higher education: A case study of students of the University of Technology. *Telematics and Informatics*, *35*(4), 1053-1070. https://doi.org/10.1016/j.tele.2017.09.016

Handayani, R. A. D., Wilujeng, I., & Prasetyo, Z. K., & Triyanto, T. (2019). Building an indigenous learning community through lesson study: challenges of secondary school science teachers. *International Journal of Science Education*, *41*(3), 281-296.https://doi.org/10.1080/09500693.2018.1548789

Haneem, F., Kama, N., Taskin, N., Pauleen, D., & Bakar, N. A. A. (2019). Determinants of master data management adoption by local government organizations: An empirical study. *International Journal of Information Management*, *45*, 25-43. https://doi.org/10.1016/j.ijinfomgt.2018.10.007

Hansen, J. G., & Antsanen, R. (2016). An elder on sea ice: an interview with aipilik inuksuk of igloolik, Nunavut. *International Indigenous Policy Journal*, 7(1), 1-17. https://doi.org/10.1111/j.1541-0064.2010.00342.x

Harrison, K. (2018). Language education policy and teachers in Puerto Rico: implications for identity, sovereignty, and community in a context of displacements. *Journal for Educators, Teachers and Trainers*, *9*(1). https://jett.labosfor.com/index.php/jett

Hart, A. E. (2018). Exploring the interpersonal dynamics of the supervisory triad of preservice teacher education: A Qualitative Meta-Synthesis (2018). .Doctor of Education in Teacher Leadership Dissertations. 23. https://digitalcommons.kennesaw.edu/teachleaddoc_etd/23

Hartley, J. (2017). Uses of youtube digital literacy and the growth of knowledge. In *The Uses of Digital Literacy* (pp. 110-131). Routledge.

Haynes, C. A., & Shelton, K. (2018). Beyond the classroom: a framework for growing school capacity in a digital age, *Journal of Research on Technology in Education*, DOI: 10.1080/15391523.2018.1451791

Heinert, S. B. (2016). Describing characteristics of and best practices in entrepreneurship education for exemplary school-based agricultural education programs: A

multiple case mixed methods study (Doctoral dissertation, University of Florida).

Hernández, J. R., & Bravo, J. L. (2019). Quality of Life from the South, Local Knowledge, Socio-Ecological Relationships, and Citizen Participation in Times of Global Climate Change. In *Quality of Life*. IntechOpen. DOI: 10.5772/intechopen.88953.

Hobongwana-Duley, H. Y. (2015). Exploring indigenous knowledge practices concerning health and well-being: a case study of isiXhosa-speaking women in the rural Eastern Cape. (Thesis). University of Cape Town , Faculty of Humanities, School of Education. Retrieved from http://hdl.handle.net/11427/15555

Hogden, A., Foley, G., Henderson, R. D., James, N., & Aoun, S. M. (2017). Amyotrophic lateral sclerosis: improving care with a multidisciplinary approach. *Journal of multidisciplinary healthcare*, *10*, 205. doi: 10.2147/JMDH.S134992

Hohlfeld, T. N., Ritzhaupt, A. D., Dawson, M. K., & Wilson, L. (2017). An examination of seven years of technology integration in Florida schools: Through the lens of the levels of digital divide in schools. *Computers & Education, 1* (13), 135- 161 https://doi.org/10.1016/j.compedu.2017.05.017

Holland, A. A. (2019). Effective principles of informal online learning design: A theory-building metasynthesis of qualitative research. *Computers & Education*, *128*, 214-226. https://doi.org/10.1016/j.compedu.2018.09.026

Huang, H. M., & Liaw, S. S. (2018). An Analysis of Learners' Intentions Toward Virtual Reality Learning Based on Constructivist and Technology Acceptance Approaches. *International Review of Research in Open and Distributed*

Learning,19(1),1-25. DOI: 10.19173/irrodl.v19i1.2503

Hughes, C. (2017a). Technology and teacher education international conference 2008 (pp. 5227-5234). Chesapeake, VA: AACE . http://www.editlib.org/p/28108.

Hughes, C. (2018b). Govt signs contract for ICT needs assessment project in rural, hinterland areas. Ministry of Public Telecommunications. Retrieved from http://gina.gov.gy/govt-signs-contract-for-ict-needs-assessment-project-in-rural-hinterland-areas/.

Huson, T. F. (2019). Educator Mindsets and the Impacts to the Teacher-Student Relationship: An Exploratory Case Study. Education Dissertations. 38. https://digitalcommons.spu.edu/soe_etd/3

Ismagilova, E., Dwivedi, Y. K., & Slade, E. (2020). Perceived helpfulness of eWOM: Emotions, fairness and rationality. *Journal of Retailing and Consumer Services*, *53*.

Jacob, M. M., Sabzalian, L., Jansen, J., Tobin, T. J., Vincent, C. G., & LaChance, K. M. (2018). The Gift of Education: How Indigenous Knowledges Can Transform the Future of Public Education. *International Journal of Multicultural Education*, *20*(1), 157-185. https://ijme-journal.org/index.php/ijme/article/view/1534

Jacob, M. M., Sabzalian, L., Johnson, S. R., Jansen, J., & Morse, G. S. N. (2019). "We need to make action NOW, to help keep the language alive": Navigating tensions of engaging Indigenous educational values in university education. *American journal of community psychology*, *64*(1-2), 126-136. https://doi.org/10.1002/ajcp.12374

Jawarneh, A. Y. (2017). Improving effectiveness of mobile learning technology for use in higher education: a comparative study of the uk and Jordan.[Cardiff Metropolitan University]. https://repository.cardiffmet.ac.uk/handle/10369/9214

Jayita, P., Bijan, S., & Shyamalendu, K. (2017). Impact of ICT in rural development: perspective of developing countries. *American Journal of Rural Development*, *5*(4), 117-120. DOI: 10.12691/ajrd-5-4

Jeffery, L. (2019). Preservice Teachers' Perceptions of Readiness for Teaching in a 1: 1 Classroom. https://digitalrepository.unm.edu/educ_teelp_etds/291

Jennings, Z. (2020). Social Inclusion in Education in the Commonwealth Caribbean. *Handbook on Promoting Social Justice in Education*, 747-782.

Jeong, H., Hmelo-Silver, C. E., & Jo, K. (2019). Ten years of computer-supported collaborative learning: A meta-analysis of CSCL in STEM education during 2005–2014. *Educational Research Review*, *28*, 100284. https://doi.org/10.1016/j.edurev.2019.100284

Jerotich, F., Kurgat, S. J., & Kimutai, C. K. (2017). Teacher preparedness in the implementation of the integrated business studies curriculum in public secondary schools in Kenya. *Journal of Education and Practice*, *8*(14), 105-111.

Jita, T. (2018). Exploring pre-service teachers' opportunities to learn to teach science with ICTs during teaching practice. *Journal of Education*, 71, http://journals.ukzn.ac.za/index.php/joe doi: http://dx.doi.org/10.17159/2520-9868/i71a05

Johnson, C. C. (2019). *Digital game based learning: an exploratory analysis of perceived*

educational benefits at a junior high school level (Doctoral dissertation). http://ukzn-dspace.ukzn.ac.za/handle/10413/18393

Johra, K. F., Ghandforoush, P., Khan, M., & Masico, R. D. D. (2017). "Role of innovativeness and self-efficacy in tourism m-learning", *Tourism Review,72*(3), 344-355. https://doi.org/10.1108/TR-02-2017-0019

Jongen, C. S., Langham, E., Bainbridge, R., & McCalman, J. (2019). Instruments for measuring the resilience of indigenous adolescents: an exploratory review. *Frontiers in public health, 7*, 194.https://doi.org/10.3389/fpubh.2019.00194

Kaarsholm, P. (2020). From abolition of the slave trade to protection of immigrants: Danish colonialism, German missionaries, and the development of ideas of humanitarian governance from the early eighteenth to the nineteenth century. *Atlantic Studies*, *17*(3), 348-374. https://doi.org/10.1080/14788810.2019.1710088

Karunaratne, T., Peiris, C., & Hansson, H. (2018). Implementing small scale ICT projects in developing countries – how challenging is it? *International Journal of Education and Development using Information and Communication Technology (IJEDICT*), *14*(1), 118-140. https://www.learntechlib.org/p/183556/

Khan, A. (2018)."Protest and Punishment: Indo-Guyanese Women and Organized Labour." *Caribbean Review of Gender Studies*, 12(3) 269-98.

Khan, A., Masrek, M. N., & Mahmood, K. (2019). The relationship of personal innovativeness, quality of digital resources and generic usability with users'

satisfaction: A Pakistani perspective. *Digital Library Perspectives*. *35*(1), 15-30. https://doi.org/10.1108/DLP-12-2017-0046

Kim, H., Sefcik, J. S., & Bradway, C. (2017). Characteristics of qualitative descriptive studies: A systematic review. *Research in nursing & health*, *40*(1), 23-42.https://doi.org/10.1002/nur.21768

Kinkead-clark, Z. (2018). School readiness at the nexus between poverty and education: The insights of two Jamaican teachers. *Journal of Curriculum, Teaching, Learning and Leadership in Education*, *3*(1), 37. 3 : Iss. 1, 36-42 https://digitalcommons.unomaha.edu/ctlle/vol3/iss1/7

Kivunja, C., & Kuyini, A. B. (2017). Understanding and applying research paradigms in educational contexts. *International Journal of Higher Education*, *6*(5), 26-41. https://doi.org/10.5430/ijhe.v6n5p26

Kovach, M. (2017). Doing indigenous methodologies. *The Sage handbook of qualitative research*

Kumar, B. T. S., & Basavaraja, M. T. (2016). Computer access and use: understanding the expectations of Indian rural students", *Quality Assurance in Education*, *24*(1), 56-69.

Kuru Gönen, S. İ. (2019). A qualitative study on a situated experience of technology integration: reflections from pre-service teachers and students. *Computer Assisted Language Learning*, *32*(3), 163-189.doi.org/10.1080/09588221.2018.1552974

Kurup, P. M., Li, X., Powell, G., & Brown, M. (2019). Building future primary teachers' capacity in STEM: based on a platform of beliefs, understandings and

intentions. *International Journal of STEM Education*, *6*(1), 10. https://doi.org/10.1186/s40594-019-0164-5.

Lamb, A. J., & Weiner, J. M. (2018). "Extending the research on 1:1 technology integration in middle schools: A call for using institutional theory in educational technology research," *Middle Grades Review: 4*(1), 1 7: https://scholarworks.uvm.edu/mgreview/vol4/iss1/3

Lawn, S., Zhi, X., & Morello, A. (2017). An integrative review of e-learning in the delivery of self-management support training for health professionals. *BMC medical education*, *17*(1), 183.

Lawson, C., Salter, A., Hughes, A., & Kitson, M. (2019). Citizens of somewhere: Examining the geography of foreign and native-born academics' engagement with external actors. *Research policy*, *48*(3), 759-774. https://doi.org/10.1016/j.respol.2018.11.008

Lazar, I. M., Panisoara, G, Panisoara, I. O. (2020). Digital technology adoption scale in the blended learning context in higher education: Development, validation and testing of a specific tool. PLOS ONE 15(7): e0235957. https://doi.org/10.1371/journal.pone.0235957

Lee, C. C., Hao, Y., Lee, K. S., Sim, S. C., & Huang, C. C. (2019). Investigation of the effects of an online instant response system on students in a middle school of a rural area. *Computers in Human Behavior*, *95*, pp.217-223 https://doi.org/10.1016/j.chb.2018.11.034.

Lee, K. W., & James, C. C. (2018). Exploring a transformative teacher professional

development model to engender technology integration in the 21st century ESL language classrooms. *International Journal of Computer-Assisted Language Learning and Teaching (IJCALLT)*, *8*(4), 13-31.

Lenkaitis, C. A., Calo, S., & Venegas Escobar, S. (2019). Exploring the intersection of language and culture via telecollaboration: Utilizing videoconferencing for intercultural competence development. *International Multilingual Research Journal*, *13*(2), 102-115 https://doi.org/10.1080/19313152.2019.1570772

Levitt, H. M., Bamberg, M., Creswell, J. W., Frost, D. M., Josselson, R., & Suárez-Orozco, C. (2018). Journal article reporting standards for qualitative primary, qualitative meta-analytic, and mixed methods research in psychology. American Psychologist 73(1),26-46. https://doi.apa.org/fulltext/2018-00750-003.html

Li, X., Chen, W., & Straubhaar, J. D. (2018). Concerns, skills, and activities: Multilayered privacy issues in disadvantaged urban communities. *International Journal of Communication* 12, 1269–1290. https://ijoc.org/index.php/ijoc/article/viewFile/7044/2298.

Li, Y. (2016). Is teacher professional development an effective way to mitigate generational digital gap? Result from a 3-year statewide teacher professional development. *Journal of Education and Training Studies*, *4*(2), 193-197. DOI: https://doi.org/10.11114/jets.v4i2.1253

Liebenberg, J., Benadé, T., & Ellis, S. (2018). "Acceptance of ICT: applicability of the unified theory of acceptance and use of technology (UTAUT) to South African students," *The African Journal of Information Systems*: *10*(3), Article

1.https://digitalcommons.kennesaw.edu/ajis/vol10/iss3/1

Lindlof, T. R., & Taylor, B. C. (2017). *Qualitative communication research methods*. Sage publications.

Lindstrom, D. L., & Niederhauser, D. S. (2016). Digital literacies go to school: A cross-case analysis of the literacy practices used in a classroom-based social network site. *Computers in the Schools*, 33(2), 103-119. doi: 10.1080/07380569.2016.1179025.

Litz, D., & Scott, S. (2017). Transformational leadership in the educational system of the United Arab Emirates. *Educational Management Administration & Leadership*, 45(4), 566–587. https://doi.org/10.1177/1741143216636112

Louise, S. (2020). A review of research exploring teacher preparation for the digital age, Cambridge Journal of Education, 50:1, 37-56, DOI: 10.1080/0305764X.2019.1625867

Lovett, R. (2017). Indigenous children's resilience: the role of demographics, relationships, achievement and culture. In *Indigenous Children Growing Up Strong* (pp. 287-308). Palgrave Macmillan, London.

Maguire, M., & Delahunt, B. (2017). Doing a thematic analysis: A practical, step-by-step guide for learning and teaching scholars. *All Ireland Journal of Higher Education*, *9*(3).3351-33514 http://ojs.aishe.org/index.php/aishe-j/article/view/335

Mangar, T. C. (2016). *The evolution of an education system in 19th century colonial British Guiana:* From the Dutch to British Compulsory Education Ordinance of

1876.Marshall, K. (2018). Global education challenges: Exploring religious dimensions. *International Journal of Educational Development, 62*(c), 184-191. DOI: 10.1016/j.ijedudev.2018.04.005

Martell, C. C., & Stevens, K. M. (2019). Culturally sustaining social studies teachers: Understanding models of practice. *Teaching and Teacher Education*, *86*, 102897. https://doi.org/10.1016/j.tate.2019.102897

Mason, L. (2018). A critical metaphor analysis of educational technology research in the social studies. *Contemporary Issues in Technology and Teacher Education*, *18*(3), 538-555. https://www.learntechlib.org/p/174375/.

McDonald, N., Schoenebeck, S., & Forte, A. (2019). Reliability and inter-rater reliability in qualitative research: Norms and guidelines for CSCW and HCI practice. Proceedings of the ACM on Human-Computer Interaction, 3(CSCW), 1-23. https://doi.org/10.1145/3359174

McGregor, H. E. (2017). One classroom, two teachers? Historical thinking and Indigenous education in Canada. *Critical Education*, *8*(14). https://doi.org/10.14288/ce.v8i14.186182

Meguid, E. A., & Collins, M. (2017). Students' perceptions of lecturing approaches: traditional versus interactive teaching. *Advances in medical education and practice*, *8*, 229-241. doi: 10.2147/AMEP.S131851.

Menezes, M. N. (2017). '*The* Amerindian of Guyana: original lords of the soil'. América Indígena *28*(2): 353-375.

Menzies, K. (2019). Forcible separation and assimilation as trauma: The historical and

socio-political experiences of Australian Aboriginal people. *Social Work & Society*, *17*(1). https://socwork.net/sws/article/view/596/1179

Merriam, S. B., & Tisdell, E. J. (2016). *Qualitative research: A guide to design and implementation* (4th ed.). San Francisco, CA: Jossey-Bass.

Mervold, D. (2019). Creating Opportunities for Entry into the Trades: Using a Blended Classroom. In J. Theo Bastiaens (Ed.), *Proceedings of EdMedia + Innovate Learning* (pp. 1579-1584). Amsterdam, Netherlands: Association for the Advancement of Computing in Education (AACE).https://www.learntechlib.org/primary/p/210272/

Milian, M., & Walker, D. (2019). Bridges to bilingualism: Teachers' roles in promoting Indigenous languages in Guatemala. In *FIRE: Forum for International Research in Education* (Vol. 5, No. 3).doi.org/10.32865/fire201953138

Min, S., So, K. K. F., & Jeong, M. (2019). Consumer adoption of the Uber mobile application: Insights from diffusion of innovation theory and technology acceptance model. *Journal of Travel & Tourism Marketing*, *36*(7), 770-783.

Mina, L. W. (2019). Analyzing and theorizing writing teachers' approaches to using new media technologies. *Computers and Composition*, *52*, 1-16.https://doi.org/10.1016/j.compcom.2019.01.002

Ministry of Education. (2018). Guyana secondary education improvement project Amerindian. Retrieved from planipolis.iiep.unesco.org/.../Guyana/Guyana_Amerindian_Peoples_Plan

Ministry of Indigenous Affairs. (2019). Indigenous peoples in Guyana

https://www.iwgia.org/en/guyana/3400-iw2019-guyana

Mital, M., Chang, V., Choudhary, P., Papa, A., & Pani, A. K. (2018). Adoption of internet of things in india: a test of competing models using a structured equation modeling approach. *Technological Forecasting and Social Change*, *136*, 339-346. DOI: 10.1016/j.techfore.2017.03.001

Mitchell, C., Friedrich, L., & Appleget, C. (2019). Preservice teachers' blogging: collaboration across universities for meaningful technology integration. *Teaching Education*, *30*(4), 356-372.https://doi.org/10.1080/10476210.2018.1486815

Mohajan, H. K. (2017a). Two criteria for good measurements in research: Validity and reliability. Annals of "Spiru Haret*". Economic Series*, *17*(4), 59. https://mpra.ub.uni-muenchen.de/83458/

Mohajan, H. K. (2018b). Qualitative research methodology in social sciences and related subjects. *Journal of Economic Development, Environment and People, 7*(1), 23-48

Morningstar, M. E., Lombardi, A., Fowler, C. H., & Test, D. W. (2017). A college and career readiness framework for secondary students with disabilities. Career development and transition for exceptional individuals, *Sage Journal. 40*(2), 79-91. https://doi.org/10.1177/2165143415589926

Morrison, G. R., Morrison, J. R., & Ross, S. M. (2016). *A review of the research literature on the infusion of technology into the school curriculum*. Baltimore, MD: Johns Hopkins University, Center for Research and Reform in Education. Retrieved from

http://education.jhu.edu/research/crre/_object_includes/A%20Review%20of%20the%20Research%20Literature%20on%20the%20Infusion%20of%20Technology%20into%20the%20School%20Curriculum.4.4.2016.pdf.

Moser, A., & Korstjens, I. (2018). Series: Practical guidance to qualitative research. Part 3: Sampling, data collection and analysis. *European Journal of General Practice*, *24*(1), 9-18. https://doi.org/10.1080/13814788.2017.1375091

Murphy, M. K., Burke, P. J., & Haider, S. (2017). A qualitative application of diffusion of innovations to adolescents' perceptions of long-acting reversible contraception's attributes. *Journal of pediatric and adolescent gynecology*, *30*(4), 484-490. DOI: 10.1016/j.jpag.2016.11.005

Mustafina, A. (2016). Teachers' attitudes toward technology integration in a Kazakhstani secondary school. *International Journal of Research in Education and Science*, *2*(2), 322-332. https://www.ijres.net/index.php/ijres

Mwanda, G., Odundo, P., & Midigo, R. (2017). Towards adoption of constructivist instructional approach in learning biology in secondary school students in Kenya: Addressing learner attitude. *International Journal of Secondary Education*,5(1), 1-11. doi: 10.11648/j.ijsedu.20170501.11

Mxunyelwa, M. (2016). Information communication technology (ICT) as a management tool for small and medium tourism enterprises (SMTEs). *African Journal of Hospitality, Tourism and Leisure*, *5*(3), 1-15. Retrieved from http//: www.ajhtl.com

Nachtigal, P. M., & Director, P. N. (2019). *Rural education: In search of a better way*.

Routledge

Nasruddin, F. A. (2018). “The Spirit of Turbulence”: East Indian Political Imaginaries in Early 20th Century British Guiana". Honors Projects. 183. https://digitalcommons.bowdoin.edu/honorsprojects/183

National Center for Educational Resource Development. (2018a). Education in Guyana. (NCERD) Retrieved from http://www.ncerd.org

National Development Strategy. (2017). Constraints to Guyana’s development. Retrieved from http://www.guyana.org/NDS/chap20.htm

Neiterman, E., & Zaza, C. (2019). A Mixed Blessing? Students' and Instructors' Perspectives about Off-Task Technology Use in the Academic Classroom. *Canadian Journal for the Scholarship of Teaching and Learning*, *10*(1), n1.

Nelson, D., Low, G., & Hammett, R. (2017). Twenty first century skills for achieving education, life, work success. *American Journal of Educational Research, 5*(2), 197-206.doi: 10.12691/education-5-2-15.

Norton, S. (2019). Middle school mathematics pre-service teachers’ content knowledge, confidence and self-efficacy. *Teacher Development*, *23*(5), 529-548. https://doi.org/10.1080/13664530.2019.1668840

Nyirenda, D., Makawa, T. C., Chapita, G., Mdalla, C., Nkolokosa, M., O’byrne, T., & Desmond, N. (2018). Public engagement in Malawi through a health-talk radio programme ‘Umoyo nkukambirana’: A mixed-methods evaluation. *Public Understanding of Science*, *27*(2), 229-242. DOI: 10.1177/0963662516656110

O'Kane, P., Smith, A., & Lerman, M. P. (2019). Building transparency and trustworthiness in inductive research through computer-aided qualitative data analysis software. *Organizational Research Methods*, 1094428119865016.

Okonji, P. E., & Ogwezzy, D. C. (2019). Awareness and barriers to adoption of assistive technologies among visually impaired people in Nigeria. *Assistive Technology*, *31*(4), 209-219. https://doi.org/10.1080/10400435.2017.1421594

Oladeinde, B. H., Omoregie, R., Odia, I., & Osakue, E. O. (2017). Public knowledge of HIV/AIDS in three rural communities of Nigeria. *Social work in public health*, *32*(2), 131-140., doi: 10.1080/19371918.2016.1230083

O'Leary, Z. (2017). *The essential guide to doing your research project*. Sage publication

Oliver, R., & Exell, M. (2020). Identity, translanguaging, linguicism and racism: the experience of Australian Aboriginal people living in a remote community. *International Journal of Bilingual Education and Bilingualism*, 1-14. https://doi.org/10.1080/13670050.2020.1713722

Ossiannilsson, E. (2018). Ecologies of Openness: reformations through open pedagogy. *Asian Journal of Distance Education, 13(2),* 103-119. http://www.AsianJDE.org

Pagán, F. J. B., Martínez, J. L., & Máiquez, M. C. C. (2018). Internet use by secondary school students: A digital divide in sustainable societies?. *Sustainability*, *10*(10), 3703.; doi:10.3390/su10103703Panina-Beard, N. (2018). A Pedagogy of Powerful Communication: Youth Radio and Radio Arts in the Multilingual Classroom, Minding the Media: Critical Issues for Learning and teaching;. 10 177-180 https://doi.org/10.1080/10749039.2017.1416144

Panina-Beard, N. (2018). A Pedagogy of Powerful Communication: Youth Radio and Radio Arts in the Multilingual Classroom, Minding the Media: Critical Issues for Learning and teaching; Vol. 10, Mind, Culture, and Activity, *Taylor & Francis Online* 25(2), 177-180, DOI: 10.1080/10749039.2017.1416144

Papazoglou, M. E., & Spanos, Y. E. (2018). Bridging distant technological domains: A longitudinal study of the determinants of breadth of innovation diffusion. *Research Policy*.47 (9), 1713-1728.

Park, S., Freeman, J., & Middleton, C. (2019). Intersections between connectivity and digital inclusion in rural communities. *Communication Research and Practice*, *5*(2), 139-155.https://doi.org/10.1080/22041451.2019.1601493

Parkinson, C., & Jones, T. (2018). Aboriginal people's aspirations and the Australian Curriculum: a critical analysis. *Educational Research for Policy and Practice, 18*(1), 75-97.

Parkman, S., Litz, D., & Gromik, N. (2018). Examining pre-service teachers' acceptance of technology-rich learning environments: A UAE case study. *Education and Information Technologies 23*(3) 1253-1275. https://doi.org/10.1007/s10671-018-9228-4

Patton, M. Q. (2015). *Qualitative research and methods: Integrating theory and practice*. Sage publications.

Pettersson, F. (2018). On the issues of digital competence in educational contexts – a review of literature. Educ Inf Technol 23, 1005–1021. https://doi.org/10.1007/s10639-017-9649-3.

Philip, L., & Williams, F. (2019). Remote rural home based businesses and digital inequalities: Understanding needs and expectations in a digitally underserved community. *Journal of Rural Studies, 68*, 306-318. https://doi.org/10.1016/j.jrurstud.2018.09.011

Pincus, K. V., Stout, D. E., Sorensen, J. E., Stocks, K. D., & Lawson, R. A. (2017). Forces for change in higher education and implications for the accounting academy. *Science Direct* 40.1-18 https://doi.org/10.1016/j.jaccedu.2017.06.001

Porter, R. (2017). *Forked tongue: The politics of bilingual education*. Routledge.

Pramanik, J., Sarkar, B., & Kandar, S. (2017). Impact of ICT in Rural Development: Perspective of Developing Countries. *American Journal of Rural Development*, 5(4), 117-120.

Prayaga, P., Rennie, E., Pechenkina, E., & Hunter, A. (2017). Digital literacy and other factors influencing the success of online courses in remote Indigenous communities. *In Indigenous Pathways, Transitions and Participation in Higher Education* (189-210). Springer, Singapore.

Priyadharshini, S. K., Ganesh, L. S., & Kondaveeti, B. (2018). Personality, culture and career assessment: The need for an indigenous tool in India. *Psychology and Developing Societies*, *30*(2), 262-285.

Rahamat, R. B., Shah, P. M., Din, R. B., & Aziz, J. B. A. (2017). Students' readiness and perceptions towards using mobile technologies for learning the English language literature component. *The English Teacher*, 16.

Rakshit, R. (2019). *Community-powered local energy planning and transitioning in off-*

grid northwestern Ontario First Nation communities (Doctoral dissertation). http://knowledgecommons.lakeheadu.ca:7070/handle/2453/4526

Raman, R., & Vachharajani, H., & Achuthan, K. (2018). Students motivation for adopting programming contests: Innovation-diffusion perspective. *Education and Information Technologies.* 23(5) 1919-1932

Ramsey, E., & Deana, B. (2018). "Feeling like a fraud: Helping students renegotiate their academic identities." College & Undergraduate Libraries 25.1 (2018): 86-90.

Ravitch, S. M., & Carl, N. M. (2016). Qualitative research: *Bridging the conceptual, theoretical, and methodological.* Thousand Oaks, CA: Sage

Ray, D., & Poonwassie, D. (2017). *Education and cultural differences: New perspectives*. Routledge.

Raza, S. A., Umer, A., Qazi, W., & Makhdoom, M. (2018). The effects of attitudinal, normative, and control beliefs on m-learning adoption among the students of higher education in Pakistan. *Journal of Educational Computing Research, 56*(4), 563-588. https://doi.org/10.1177/0735633117715941

Redmond, P., & Lock, J. (2019). Secondary pre-service teachers' perceptions of technological pedagogical content knowledge (TPACK): What do they really think?. *Australasian Journal of Educational Technology*, *35*(3)45-54. https://doi.org/10.14742/ajet.4214

Rennie, J., White, S., Anderson, P., & Darling, A. (2018). Preparing Teachers to Work with and for Remote Indigenous Communities: Unsettling Institutional Practices. *In Teacher Education In and For Uncertain Times* 113-127. Springer, Singapore.

Rogers, E. M. (1995a). *Diffusion of Innovations.* The Free Press, New York.

Rogers, E. M. (2004b). *Diffusion of innovations* (5th ed.). New York, NY: Free Press.

Rogers, S. E. (2016). Bridging the 21st century digital divide. Association for educational communications and technology. *Tech Trends* 60(3):197–199. doi: 10.1007/s11528-016-0057-0

Rose, J., & Johnson, C. W. (2020). Contextualizing reliability and validity in qualitative research: toward more rigorous and trustworthy qualitative social science in leisure research. *Journal of Leisure Research*, 1-20.https://doi.org/10.1080/00222216.2020.1722042

Rubin, H. J., & Rubin, I. S. (2012). Qualitative interviewing: The art of hearing data (3rd ed.). Thousand Oaks, CA: SAGE.

Sadaf, A., & Johnson, B. A. (2017). Teachers' Beliefs About Integrating Digital Literacy Into Classroom Practice: An Investigation Based on the Theory of Planned Behavior. Journal of Digital Learning in Teacher Education, 33,129-137. DOI:10.1080/21532974.2017.1347534

Sai, A. A. (2018). An exploratory study of innovation adoption in Estonia. *Open Journal of Business and Management*, *6*(4), 857.

Saldaña, J. (2016*). The coding manual for qualitative researchers.* Thousand Oaks, CA: Sage

Sánchez, P. A., de Haro-Rodríguez, R., & Martínez, R. M. (2019). Barriers to student learning and participation in an inclusive school as perceived by future education professionals. *Journal of New Approaches in Educational Research (NAER*

Journal), *8*(1), 18-24. https://www.learntechlib.org/p/207145/

Salemink, K., Strijker, D., & Bosworth, G. (2017). Rural development in the digital age: A systematic literature review on unequal ICT availability, adoption, and use in rural areas. *Journal of Rural Studies*, *54*, 360-371.

Sánchez-Prieto, J. C., Hernández-García, Á., García-Peñalvo, F. J., Chaparro-Peláez, J., & Olmos-Migueláñez, S. (2019). Break the walls! Second-Order barriers and the acceptance of mLearning by first-year preservice teachers. *Computers in Human Behavior*, *95*, 158-167.https://doi.org/10.1016/j.chb.2019.01.019

Sánchez-Prieto, J. C., Huang, F., Olmos-Migueláñez, S., García-Peñalvo, F. J., & Teo, T. (2019). Exploring the unknown: The effect of resistance to change and attachment on mobile adoption among secondary pre-service teachers. *British Journal of Educational Technology*, *50*(5), 2433-2449. https://doi.org/10.1111/bjet.12822

Sandelowski, M. (2000). Focus on research methods-whatever happened to qualitative description? *Research in nursing and health*, *23*(4), 334-340.

Sarfo, F. K., Amankwah, F., & Konin, D. (2017). Computer self-efficacy among senior high school teachers in Ghana and the functionality of demographic variables on their computer self-efficacy. *Turkish Online Journal of Educational Technology-TOJET*, *16*(1), 19-31.

Saritas, O., & Kuzminov, I. (2017). Global challenges and trends in agriculture: impacts on Russia and possible strategies for adaptation. *Foresight*, *19*(2), 218-250.

Sarker, M. N. I., Wu, M., Cao, Q., Alam, G. M., & Li, D. (2019). Leveraging Digital Technology for Better Learning and Education: A Systematic Literature Review.

International Journal of Information and Education Technology, 9(7), 453–461.doi.org/10.18178/ijiet.2019.9.7.1246.

Sauers, N. J., & McLeod, S. (2017). Teachers' technology competency and technology integration in 1:1 schools. *Journal of Educational Computing Research*, 56(6), 892-910. https://doi.org/10.1177/0735633117713021

Scheerder, A., van Deursen, A., & van Dijk, J. (2017). Determinants of internet skills, use and outcomes: A systematic review of the second and third level digital divide. *Telematics and informatics*, *34*(8), 1607-1624. doi: 10.1016/j.tele.2017.07.007

Scherer, R., Siddiq, F., & Tondeur, J. (2019). The technology acceptance model (TAM): A meta-analytic structural equation modeling approach to explaining teachers' adoption of digital technology in education. *Computers & Education*, *128*, 13-35. https://doi.org/10.1016/j.compedu.2018.09.009

Scherer, R., Tondeur, J., Siddiq, F., & Baran, E. (2018). The importance of attitudes toward technology for pre-service teachers' technological, pedagogical, and content knowledge: Comparing structural equation modeling approaches. Computers in Human Behavior, 80, 67-80. doi: 10.1016/j.chb.2017.11.003

Schou, J., & Pors, A. S. (2019). Digital by default? A qualitative study of exclusion in digitalised welfare. *Social Policy & Administration*, *53*(3), 464-477. https://doi.org/10.1111/spol.12470

Schuck, S., Aubusson, P., & Burke, P. F. (2018). Teachers' technology adoption and practices: Lessons learned from the IWB phenomenon AU—Kearney, Matthew. Teacher Development, 22(4), 481–

496.https://doi.org/10.1080/13664530.2017.1363083

Seidman, I. (2013). *Interviewing as qualitative research*. New York: Teachers College Press

Sellars, M., Fakirmohammad, R., Bui, L., Fishetti, J., Niyozov, S., Reynolds, R., Thapliyal, N., Smith, Y., & Ali, N. (2018). Conversations on critical thinking: can critical thinking find its way forward as the skill set and mindset of the century? *Education Sciences*, *8*(4), 2-29, doi: 10.3390/educsci8040205 www.mdpi.com/journal/education

Serdyukov, P. (2017). Innovation in education: what works, what doesn't, and what to do about it? *Journal of Research in Innovative Teaching & Learning,10*(1). pp. 4-33. https://doi.org/10.1108/JRIT-10-2016-0007

Shamir, B., & Eilam-Shamir, G. (2018). "*What's your story?" A life-stories approach to authentic leadership development. In Leadership Now: Reflections on the Legacy of Boas Shamir* (51-76). Emerald Publishing Limited.

Shapiro, H. B., Lee, C. H., Roth, N. E. W., Li, K., Çetinkaya-Rundel, M., & Canelas, D. A. (2017). Understanding the massive open online course (MOOC) student experience: An examination of attitudes, motivations, and barriers. *Computers & Education*, *110*, 35-50.https://doi.org/10.1016/j.compedu.2017.03.003

Showalter, D., Hartman, S. L., Johnson, J., & Klein, B. (2019). Why Rural Matters 2018-2019: The Time Is Now. A Report of the Rural School and Community Trust. *Rural School and Community Trust*. http://www.ruraledu.org/

Siefert, B., Kelly, K., Yearta, L., & Oliveira, T. (2019). Teacher perceptions and use of

technology across content areas with linguistically diverse middle school students. *Journal of Digital Learning in Teacher Education*, *35*(2), 107-121. https://doi.org/10.1080/21532974.2019.1568327

Signori, P., Flint, D. J., & Golicic, S. L. (2017). Constrained innovation on sustainability in the global wine industry. *Journal of wine research*, *28*(2), 71-90. https://doi.org/10.1080/09571264.2017.1302413

Singer, E., & Couper, M. P. (2017). Some methodological uses of responses to open questions and other verbatim comments in quantitative surveys. *Methods, data, analyses: a journal for quantitative methods and survey methodology (mda)*, *11*(2), 115-134. https://doi.org/10.12758/mda.2017.01

Smillie, I. (2017). The retirement project of George Stuart Atkins: development radio in the time of cybernetics. *Development in Practice*, *27*(8), 1133-1140 https://doi.org/10.1080/09614524.2017.1363872.

Snyder, K. (2018). *The Iraqw of Tanzania: negotiating rural development*. Routledge.

Solomon, K. (2017). *Teachers and 1: 1 technology in classroom activities: A quantitative study comparing perceptions and stage of adoption*. (Doctoral Dissertation, University of Tennessee at Chattanooga).Retrieved from https://scholar.utc.edu/cgi/viewcontent.cgi?article=1693&context=theses7

Spence, D. O. (2018). *Salt water in the blood: Race, indigenous naval recruitment and British colonialism, 1934–41*. In A new naval history. Manchester University Press.

Spicer, Z., Goodman, N., & Olmstead, N. (2019). The frontier of digital opportunity:

Smart city implementation in small, rural and remote communities in Canada. *Urban Studies*, 0042098019863666. https://doi.org/10.1177/0042098019863666

Spiteri, M., & Rundgren, C. (2018). Literature review on the factors affecting primary teachers' use of digital technology. *Technology, Knowledge and Learning* 1-14. https://doi.org/10.1007/s10758-018-9376-x

Spiteri, M., & Rundgren, S. N. C. (2020). Literature review on the factors affecting primary teachers' use of digital technology. *Technology, Knowledge and Learning*, *25*(1), 115-128. https://doi.org/10.1007/s10758-018-9376-x

Stake, R. E. (2005). Qualitative case studies. In N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research* (3rd.ed.) (pp. 443-466). Thousand Oaks, CA: Sage

Stewart, H., Gapp, R., & Harwood, I. (2017). Exploring the alchemy of qualitative management research: Seeking trustworthiness, credibility and rigor through crystallization. *The Qualitative Report*, *22*(1), 1-19.

Strauss, A., & Corbin, J. (1998). *Basics of qualitative research techniques*. Thousand Oaks, CA: Sage publications.

Sun, P. (2019). Pengchun Chang's Contributions to International Human Rights in Global Governance. *Human Rights Quarterly*, *41*(4), 982-1002. 10.1353/hrq.2019.0070

Swartz, R. (2019). 'The Gift of Education': Emancipation and Government Education in the West Indies, Britain and Beyond. In *Education and Empire* (pp. 35-72). Palgrave Macmillan, Cham. doi.org/10.1007/978-3-319-95909-2_2

Tajeddin, Z., & Alemi, M. (2019). Effective Language Teachers as Persons: Exploring Pre-Service and In-Service Teachers' Beliefs. *TESL-EJ*, *22*(4), n4.

Tan, C. T. (2017). Enhancing the quality of kindergarten education in Singapore: policies and strategies in the 21st century. ICEP *11*(7). https://doi.org/10.1186/s40723-017-0033-y

Tassel-Baska, J. V., & Hubbard, G. F. (2016). Classroom-based strategies for advanced learners in rural settings. *Journal of Advanced Academics*. 27 (4), 285–310. Doi.10.1177/1932202X16657645.

Taysum, A., & Abery, V. M. (2017). Shifts in education policy, administration and governance in Guyana 1831–2017. Seeking ‘a political’ agenda for equity and renewal. *Italian Journal of Sociology of Education*, 9(2)55-87.doi. 10.14658/pupj-ijse-2017-2-4

Thorne, S. (2016). *Interpretive description: Qualitative research for applied practice* Routledge.

Tikly, L. (2019). Education for sustainable development in Africa: a critique of regional agendas. *Asia Pacific Education Review*, *20*(2), 223-237. https://doi.org/10.1007/s12564-019-09600-5

Timar, T., Carter, A., & Ford, N. (2018). The Network Solution: How Rural District Networks Can Drive Continuous Improvement. *Policy Analysis for California Education, PACE*. https://eric.ed.gov/?id=ED591090

Tissenbaum, M., & Slotta, J. D. (2019). Developing a smart classroom infrastructure to support real-time student collaboration and inquiry: A 4-year design

study. *Instructional Science*, *47*(4), 423-462. https://doi.org/10.1007/s11251-019-09486-1

Tojo, H., & Takagi, A. (2017). Trends in qualitative research in three major language teaching and learning journals, 2006–2015. *International Journal of English Language Teaching*, *4*(1), 37-47. https://doi.org/10.5430/ijelt.v4n1p37

Tormala, Z. L., & Rucker, D. D. (2018). Attitude certainty: Antecedents, consequences, and new directions. *Consumer Psychology Review*, *1*(1), 72-89. https://doi.org/10.1002/arcp.1004

Torres, R. A. (2017). Transforming Indigenous Curriculum in the Philippines through Indigenous Women's Knowledge and Practices: A Case Study on Aeta Women Healers. In *Inclusive Education in African Contexts* (173-189). Brill Sense

Townsend, L., Wallace, C., Fairhurst, G., & Anderson, A. (2017). Broadband and the creative industries in rural Scotland. *Journal of rural studies*, *54*, 451-458. https://doi.org/10.1016/j.jrurstud.2016.09.001

Trimmer, K., Ward, R., & Wondunna-Foley, L. (2018). Retention of indigenous pre-service teachers enrolled in an Australian regional university. *Teaching and Teacher Education*, *76*, 58-67.doi. 10.14221/ajte.2016v41n6.9

Tsai, Y. S., Poquet, O., Gašević, D., Dawson, S., & Pardo, A. (2019). Complexity leadership in learning analytics: Drivers, challenges and opportunities. *British Journal of Educational Technology*, *50*(6), 2839-2854. https://doi.org/10.1111/bjet.12846

Tyler-Wood, T. (2018). Historical invention kits: A comparison of the achievement gains

of high and low performing students in rural Texas, EduLearn 2018 Conference Proceedings, International Conference on Education and New Learning Technologies, Palma de Mallorca, Spain.

Tyler-Wood, T. L., Cockerham, D., & Johnson, K. R. (2018). Smart Learn. *Environ.* 5(22). 2-16. https://doi.org/10.1186/s40561-018-0073-y

Uduji, J. I., & Okolo-Obasi, E. N. (2017). Multinational oil firms' CSR initiatives in Nigeria: The need of rural farmers in host communities. *Journal of International Development*, 29(3), 308–329. https://doi.org/10.1002/jid.3243

United Nations. (2018). Human development report launched in Guyana. Retrieved from http://www.gy.undp.org/content/guyana/en/home/presscenter/pressreleases/2014/07/25/2014-human-development-report-launched-in-guyana.

United Nations Educational, Scientific and Cultural Organization. (2018a). Information and communication technology (ict) in education in Asia A comparative analysis of ICT integration and e-readiness in schools across Asia

United Nations Educational, Scientific and Cultural Organization. (2019b). UNESCO ICT competency framework for teachers. Retrieved from http://www.unesco.org/new/en/communication-and-information/access-to-knowledge/unesco-ict-competency-framework-for-teachers/

Vaismoradi, M., Jones, J., Turunen, H., & Snelgrove, S. (2016). Theme development in qualitative content analysis and thematic analysis. 10.5430/jnep.v6n5p100

Valadez, J. (2018). *Deliberative Democracy, Political Legitimacy, and Self-determination In Multi-cultural Societies.* Routledge.

Van Mele, P., Okry, F., Wanvoeke, J., Barres, N. F., Malone, P., Rodgers, J., & Salahuddin, A. (2018). Quality farmer training videos to support South–South learning. *CSI Transactions on ICT*, *6*(3-4), 245-255.

van Wyk, M. (2017). An e-portfolio as empowering tool to enhance students' self-directed learning in a teacher education course: A case of a South African university. South African Journal of Higher Education. 31. 10.20853/31-3-834.

Varanasi, R. A., Kizilcec, R. F., & Dell, N. (2019). How Teachers in India Reconfigure their Work Practices around a Teacher-Oriented Technology Intervention. *Proceedings of the ACM on Human-Computer Interaction*, *3*(CSCW), 1-21. https://doi.org/10.1145/3359322

Varier, D., Dumke, E. K., Abrams, L. M., Conklin, S. B., Barnes, J. S., & Hoover, N. R. (2017). Potential of one-to-one technologies in the classroom: teachers and students weigh in. *Educational technology research and development*, *65*(4), 967-992. doi.org/10.1007/s11423-017-9509-2

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. Management Science, 46, 186–204. https://doi.org/10.1287/mnsc.46.2.186.11926

Venkatesh, V., Thong, J. Y., & Xu, X. (2016). Unified theory of acceptance and use of technology: A synthesis and the road ahead, 17(5): 328-376. DOI:10.17705/1jais.00428

Verger, A., Altinyelken, H. K., & Novelli, M. (Eds.). (2018). *Global education policy and international development: New agendas, issues and policies*. Bloomsbury

Publishing.

Verma, P., & Sinha, N. (2018). Integrating perceived economic wellbeing to technology acceptance model: The case of mobile based agricultural extension service. *Technological forecasting and social change*, *126*, 207-216.https://doi.org/10.1016/j.techfore.2017.08.013

Vicary, S., Young, A., & Hicks, S. (2017). A reflective journal as learning process and contribution to quality and validity in interpretative phenomenological analysis. *Qualitative Social Work*, *16*(4), 550-565. https://doi.org/10.1177/1473325016635244

Waisbord, S. (2018). The elective affinity between post-truth communication and populist politics, Communication Research and Practice, 4:1, 17-34, doi: 10.1080/22041451.2018.1428928

Walid, N., Noor, N. L. M., Ibrahim, E. N. M., & Ang, C. S. (2017). *Potential motivational factors of technology usage for indigenous people in Peninsular Malaysia*. In Proceedings - 2016 4th International Conference on User Science and Engineering, *i-USEr 2016* (pp. 259-264). [7857971] Institute of Electrical and Electronics Engineers Inc. doi: 10.1109/IUSER.2016.7857971

Wang, X., Yuen, K. F., Wong, Y. D., & Teo, C. C. (2018). An innovation diffusion perspective of e-consumers' initial adoption of self-collection service via automated parcel station. *The International Journal of Logistics Management*. ISSN: 0957-4093

Weuffen, S. (2019). Surveying the landscape five years on: An examination of how

teachers, and the teaching of Australia's shared-history, is constructed within Australian academic literature. *Teaching and Teacher Education, 78,* 117-124. Doi:10.1016/j.tate.2018.11.010

Winter, J., & Boudreau, J. (2018). Supporting self-determined indigenous innovations: Rethinking the digital divide in Canada. *Technology Innovation Management Review*, *8*(2). doi.org/10.22215/timreview/1138

Woodside, J. M., Augustine, F. K., Jr., & Giberson, W. (2017). "Blockchain Technology Adoption Status and Strategies," *Journal of International Technology and Information Management, 26*(2)1-30: http://scholarworks.lib.csusb.edu/jitim/vol26/iss2/4

World Bank. (2016a). World development report: Attacking poverty 2001. Retrieved from: http://www.ssc.wisc.edu/~walker/wp/wp-content/uploads/2012/10/wdr2001.pdf

Yazan, B. (2015). Three approaches to case study methods in education: Yin, merriam, and stake. *The qualitative report,* 20(2). Retrieved from http://nsuworks.nova.edu/tqr/vol20/iss2/12/

Yeh, E., & Wan, G. (2019). Media Literacy Education and 21st Century Teacher Education. *The International Encyclopedia of Media Literacy*, 1-18. https://doi.org/10.1002/9781118978238.ieml0230

Yekinni, O. T., Ladigbolu, T. A., Adeniyi, R. T., & Adebisi, G. L. (2019). Benefits Derived from the Use of Information and Communication Technologies among Rural Farmers in Northeast Nigeria. *Journal of Agricultural Extension*, *23*(3),

117-125. DOI: 10.4314/jae.v23i3.10

Yin, R. K. (2017). *Case study research and applications: Design and methods*. Sage publications.

Zarhin, D. (2018). Conducting joint interviews with couples: Ethical and methodological challenges. *Qualitative health research, 28*(5), 844-854. https://doi.org/10.1177/1049732317749196

Zayyad, M. A., & Toycan, M. (2018). Factors affecting sustainable adoption of e-health technology in developing countries: an exploratory survey of Nigerian hospitals from the perspective of healthcare professionals. *PeerJ* 6: e4436; DOI 10.7717/peerj.4436

Zeng, Y., Dong, P., Shi, Y., & Li, Y. (2018). On the disruptive innovation strategy of renewable energy technology diffusion: An agent-based model. *Journal of Energies, 11*(1), 1-22. https://doi.org/10.3390/en11113217

Appendix A: Interview Questions

RQ1-What are Indigenous Amerindian preservice teachers' perceptions of the adoption of digital technology in their daily pedagogical practices?

RQ2-What are the perceived barriers to the adoption of digital technology by Indigenous Amerindian preservice teachers?

RQ3-What are the perceived coping and adapting mechanisms used to overcome the barriers to integration of digital technology by Indigenous Amerindian preservice teachers?

Semistructured Questions

1. Describe your perception about using digital technology in your teaching practice.
2. How has the delivery of instruction influenced how you perceive the use of digital technology in your teaching practice?
3. How is the training you are getting to prepare you to integrate digital technology into the classroom?
4. What are your experiences with integrating digital technologies in the classroom?
5. As a preservice Indigenous Amerindian teacher, what barriers do you face when integrating digital technology in the classroom?
6. When using digital technology in your training, what are some of the advantages and disadvantages of its use to you as a student?
7. Do these barriers play a significant role in your decision to adopt or reject digital technology?

8. What kind of challenges did you encounter from interacting with either the administration, lecturer or anywhere else when you tried to utilize the newly acquired technological skills and knowledge?
9. What skills and knowledge do you think you lack that might be affecting your use of digital technology?
10. Using 'Rogers Theory' as a base, into which category of adopter do you see yourself; as (a) an innovator or venturesome who is obsessed with applying complex and technical knowledge; (b) early adopter or respecter – having the ability to speed up diffusion via a missionary approach; (c) early majority or deliberator – encouraging peers to use an innovation , never the one to try an innovation first; (d) late majority, or skeptical - motivating others to try new innovations before they are adopted; (c) laggards or traditional - making decisions based on previous experiences.

    Tell me more about your choice.
11. Describe the biggest pedagogical barrier(s) that you encounter as an Indigenous preservice teacher in training when integrating digital technology in your classroom.
12. What changes would you like to see in the teacher training program for Indigenous Amerindian preservice teachers to help them become adopters of digital technology?
13. In your view, what are the most significant factors that may promote or hinder the adoption of digital technology by Indigenous teachers in training?

Unstructured Questions

14. Tell me about the current state of digital technology in your teaching practice.

15. Share your usage pattern of digital technology in the teacher training college for classroom purposes (such as grades, curriculum implementation, multi-media presentation etc.…)
16. Describe in detail how digital technology is used at the teachers' training college for classroom purposes (such as grades, curriculum implementation, multi-media presentation etc.…)
17. Describe your challenges in your local community when an attempt is made to integrate digital technology into the classroom?
18. Please provide any additional comments.

Appendix B Letter of Invitation

Hello,

I hope this note finds you well.

My name is Volda Elliott, and I am a PhD student at Walden University. I am currently planning my final research study that precedes writing my dissertation, and the purpose of my study is to discover the perceptions of Indigenous Amerindian preservice teachers about digital technology integration in the classroom.

I am seeking Indigenous Amerindian preservice teachers that originate from hinterland, remote, riverine communities to participate in my dissertation study. Much research has been done in the area at the primary secondary levels among other ethnic groups, but very little has been done at the tertiary level especially with regards to Indigenous Amerindian teacher perceptions about the adoption of digital technology. This study will contribute to a growing body of knowledge that can help support stakeholders improve educational practices at the teachers' training institution.

Your participation in this study is completely voluntary and involves one interview session that can occur in person face to face or via virtual conference call technology. After our interview, I will send you the transcript of our conversation and the analysis of the interview data via email for your verification.

Please let me know if you would be able to participate. You can contact me by phone at (592) 601-1926 or e-mail at volda.elliott@waldenu.edu if you have any questions.

Thank you, Volda Elliott.

Appendix C: Coding transcripts

Examples of how the coding of Interview Transcripts were Conducted

Emergent Themes	Content Descriptions (with citations)	Inclusion Criteria
Perceptions	They must be able to communicate effectively without any objections for mutual understanding (Rogers, 2003, p34); "Focuses on the character because of the newness of the tool. It emphasizes understanding through multiple channels and opposed to narrow focus" (Rogers, 2003, p. 82)	IAPTs mentions openness of dissemination of technology information (i.e., doesn't have a clean sense of computers and other technological tools). IAPTs have shared experiences (i.e., socio-economic; status, workload; lack of information for the institution)
Skills and Knowledge	They must be able to demonstrates the integration of previous knowledge through collaboration and educational practices (Rogers.,2003, p.325)	IAPTs mentions technology skills and knowledge, strengths and weakness to meet them beyond the classroom. IAPT mentions strategies for understanding technology IAPTs are open to creativity, collaboration and connectivity.
Initial Reaction	They must be able to reflect on their exposure and perception (Rogers, 2003, p.224). It emphasizes state of mind of accepting an innovation as opposed to rational	IAPTs mentions the use of terminology / meaningful application often support their reaction IAPT has an extrinsic outlook (i.e., doesn't know new methods and materials)
Approach of Lecturers	They must be able to portray attributes that are logical and sound. Focuses on benefits adopters receives (Rogers, 2002, p.230).	IAPT mentions openness of to teaching practice (i.e., provide materials and strategies to become improved practitioners) Lecturers provide guidance to shift the instruction.

Previous Knowledge	They must be able to demonstrates the acquisition technological skills in stages (TAM Davis'2004). Focuses on the utilization of new technology to achieve knowledge.	IAPT has shared experiences (i.e., technology instructions, strategies and skills) that don't support novice practitioners, IAPT mentions transfer of knowledge to improve training
Basic Knowledge	They must be able to involve themselves fully without any bias in new innovation (Davis, 2004, p. 320). Focuses on being able to access and process information for decision making (TAM	IAPT mentions knowledge to transform instruction. IAPT mentions strategies to proficient training
Individual Barriers	They must be able to reflect on past experiences with cultural values (Rogers, 2003, p.241). "Focusses on strong norms, values dealing with potential adoption.by carefully describing them.	IAPT has shared experiences (i.e., personal characteristics at all sphere) that were support during training. IAPT mentions meaningful strategies of integrating new tools. IAPT mentions procedural sustenance for professional growth (i.e., digital technology).
Quality of Teaching	"They must reflect on procedures into logically sound theories" Focuses on practice as opposed to inadequate teaching (Roger's, 2003, p.412)	Lecturers uses knowledge to meet the goals of teacher training, IAPT is open to try new strategies to improve quality education. IAPT mentions openness to teacher improvement.
Decisions to Adopt or Reject DT	They must be able to use these theories to make decisions and think critically" (Rogers, 2003, p. 239); "Focuses on mandate for people to change their behavior within a system" (Roger's ,2003, p.	IAPT has shared (i.e., lack of resources, knowledge) the impact of decision making for professional growth. IAPT mentions the process of technology integration for professional growth
Empowerment	They must be able to use these theories to reaffirm their practical	IAPT mentions the support for planning for strategy integration.

	application (Davis, 1989, p.); "Focuses on action intention for people or system to be determine their willingness and ability to be robust in the process" (Davis, 1989, p…)	Lecturer engages in providing strategies from the lecturers to the trainers.
Support for Training	They must be able to create concepts that integrate their thought into logical sound theories, (Roger, 2003, p.415); "Focuses on being involved in changes and dealing with individual experiences in a personal way. It emphasizes changes opposed to rejection (roger, 2002, p. 399)	Lecturer facilitates strategies and support for meaning training. IAPT mentions openness of technical knowledge with digital tools.
Current State of DT	They must be able to reflect fully on roles and practices without contradiction (Roger, 2003, p.404) "Focuses on the authority structure instead on the positions"	Lecturer supports novice teachers for changing pedagogical practices. IAPT mentions administrator support for implementing digital technology.
Community Barriers	They must be able to reflect on structure and their interactions for multiple viewpoints (Rogers, 2003, p.175) "Focuses on understanding the problems and conditions by carefully describing them. It emphasizes reinforcement as opposed to	IAPT shared that (core values, beliefs, culture) community practices support IAPT mentions communication to community involvement in technology.
Teaching Preparation	"They must be able to use these theories to resist negative characteristics from	Lecturers use knowledge to transform pedagogical practices.

	many lenses" (Davis, 1989, p..); "Focuses on development of new skills. It emphasizes practical applications as opposed to achieving special outcomes" (Davis, 1989)	Lecturers has shared experiences (i.e., content area; final year with practical strategies) that were supportive during pedagogical practices.
Working Technology Plan	"They must be able to measure from first knowledge to time of conformation (Rogers' 2003, p.213) Focuses on using realistic ideas and methods. It emphasizes knowledge as a rapid rate of awareness as opposed to misuse of information (Roger's, 2003, p.214)	IAPT has shared technology plan (i.e., computer skills; strategies) for curriculum improvement. IAPT mentions technology readiness for program alignment and integration
Constant Professional Development	"They must be able to use these theories to make decisions to resolve problems" (Davis, 1989, p..); Focuses on actively involve dialogue, action learning with an emphasis on creating a culture of leaning within the organization "	Lecturer use knowledge of educational goal to address IAPTs weakness and strengthen previous knowledge. Lecturer has shared practices that support the integration of digital technology.
Motivational Tool	They must be able to create concepts that integrate their skills from multiple lenses (Rogers, 2003, p. 263) "Focuses on using system such as organizations, systems-level and critical mass. It emphasizes societal changes as opposed to institution	IAPT mentions strategies for technology motivational structure. IAPT is open to try structure new path to integrate digital technology.
Adopters	They must be able to involve themselves fully without extrinsic not	IAPT mentions characteristics to adopt digital technology

intrinsic force (Rogers,2004, p268; Focuses on systems on the bases of conveniences within a social setting. It emphasizes on overt behavioral changes as opposed to cognitive or attitudinal change" (Rogers, 2003, p.32.	IAPT mentions lecturers provided strategies that supports adoption Lecturers support potential adopters in reflecting on their training experiences.