SELECT COSTA RICAN SECONDARY TEACHERS' PERCEPTIONS OF THEIR

EXPERIENCES ABOUT THE INCORPORATION OF MOBILE DEVICES IN THE

CLASSROOMS

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by

Ana Marcela Montenegro Sánchez

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APPROVED:

Hannah R. Gerber, Ph.D.
Dissertation Director

Lori Haas, Ed.D.
Committee Member

Benita Brooks, Ph.D.
Committee Member

Helen Berg, Ph.D.
Committee Member

George Saltsman, Ed.D.
Committee Member

Stacey L. Edmonson, Ed.D.
Dean, College of Education

DEDICATION

I dedicate this dissertation to my family. Firstly, to parents. My mom is my inspiration of faith to God, humbleness and perseverance through the moments I needed a helping hand and help others. My father was my example of curiosity, generosity and happiness despite of the difficulties of life. He was the first person who introduced me to the wonders of reading a book and I followed his example since then. Without my parents' example, I would have not been able to overcome the challenges I faced in this venture. I am deeply grateful I finished this journey and my parents are still alive to witness it. I just want to let them know, that everything they went through to be where I am at this moment of my life was worth it. Mommy and Daddy, it was worth it.

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ABSTRACT

Montenegro Sánchez, Ana Marcela, *Select Costa Rican secondary teachers' perceptions of their experiences about the incorporation of mobile devices in the classrooms*. Doctor of Education (Literacy), May, 2020, Sam Houston State University, Huntsville, Texas.

In the advent of the digital era, mobile learning has marked a new precedent for traditional educational practices. The use of mobile devices as a technological tool to enhance education has been embraced in different school settings to provide a quality of education to students, and Costa Rica is not the exception. Costa Rica's educational system seeks to incorporate mobile technologies in their teaching practices to meet the expectations of the 21st century. However, it is crucial to know teachers' perceptions and experiences regarding the incorporation of mobile devices in the class to successfully implement these mobile technologies.

This Interpretive Phenomenological study, examined ten secondary Costa Rican teachers' perceptions of their experiences regarding the incorporation of mobile devices in the classroom. The study took place in the northern Pacific cost of Costa Rica. The methodology consisted of semi-structure interviews and Interpretive Phenomenological Analysis was employed to analyze the data obtained from the participants. Findings suggest mixed perceptions regarding the use of mobile devices in the classrooms and the challenges participants expressed to successfully incorporate mobile devices in their teaching practice. These mixed perceptions reflect that mobile devices are helpful for the teaching process if following the appropriate guidelines and providing teachers with necessary professional development to allow them to successfully incorporate the mobile devices in their teaching practice. Implications and recommendations are suggested in discussion of the findings.

KEY WORDS: Mobile devices, Teachers' perceptions, Mobile devices beneficial and

detrimental, Mobile devices guidelines, Professional development, Mobile learning.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter I

Introduction

The implementation of mobile technologies in Costa Rican classrooms is a fairly new phenomenon; however, over the last ten years, the Ministerio de Educación Pública de Costa Rica (MEP) has been making efforts to promote the use of mobile technologies in the classrooms to help students to become more competitive and prepared to fulfill the needs of the changing world's demands (MEP, Fundación Telefónica, & Fundación Omar Dengo, 2017; Zamora, 2012; Zúñiga, 2018). Thus, the MEP has made concerted efforts with private and public institutions to integrate Information and Communication Technologies (ICT's) in the educational system to provide innovative teaching practices for students across different educational levels (The United Nations, Scientific and Cultural Organization [UNESCO], 2016; Núñez, 2018; Zamora, 2012; Zúñiga, 2018).

To this end, Anderson, (2010) defines ICT's as a series of technological tools that enable us to communicate, receive, and exchange information with others. UNESCO (2020) adds that ICT's encompass "computer, internet (websites, blogs, and emails), live broadcasting technologies (radio, television, and webcasting), recorded broadcasting technologies (podcasting, audio and video players and storage devices), and telephony (fixed or mobile, satellite, vision/video conferencing, etc.)" (para. 3).

Computer laboratories, professional development, and the creation of different national programs addressing the incorporation of technologies in the classrooms have been designed to provide schools and communities with contemporary educational practices (MEP et al., 2017; Zamora, 2012; Zúñiga, 2018). Nonetheless, only a few educational institutions have the technological resources and the logistics to make this

feasible (MEP, 2018; UNESCO, 2016). Likewise, even though the MEP has been creating programs to maximize the use of the digital technologies in the classrooms, there is a need to provide more professional training to Costa Rican teachers, so they successfully implement digitally-based pedagogies (Núñez, 2018).

Similarly, MEP stakeholders are also cognizant of the challenges to incorporating mobile technologies into the conventional teaching practices in Costa Rican educational settings (Díaz, 2018; Núñez, 2018). With the advent of the current digital age, the Ministry of Education of Costa Rica's main priority is to provide students with a quality of education that meets the demands of the 21st century (MEP et al., 2017; UNESCO, 2016; Zúñiga, 2018).

My Research Interest in Mobile Devices

I have been part of the Costa Rican educational system for almost 30 years as a student and as an educator. During the 1980s, the incorporation of technology was part of MEP's efforts to engage students in technological practices (MEP et al., 2017; Zúñiga, 2018). I remember when I was in primary school and received computer lessons, where I had to use the mouse and input different commands to create figures with the help a small turtle. During the 1990s, while I was in secondary level, I was involved in innovative learning practices with the use of computers as well. I could access limited number of modern computers, where students had to work in groups. In 2000s, I became a teacher of English as a foreign language, working for the Ministry of Education of Costa Rica, and I witnessed how the technological reforms were evolving and taking place in Costa Rican's educational system. In 2013, as a Costa Rican educator, I experienced the widespread growth of mobile devices within students in different school settings. I

observed that students' communication dynamics had changed; instead of having a verbal communication within their groups as they usually did, they were in a group communicating through their cell phones. This caught my attention.

As part of my doctoral program in literacy, I conducted a book club project in my hometown with secondary students that triggered my interests concerning Costa Rican secondary Spanish teachers' perceptions regarding the use of mobile devices in the classrooms. To conduct this book club, I had to bring the book *Hush, Hush* from Texas, because in my hometown we do not have bookstores with a variety of literature for teenagers. The book students chose to read was not in the public library either. While conducting the book club, the students were engaged in the conversations and I asked them if they brought the books I provided to them. One of the youth participants asked me, why they could not download the digital book and read it with their cell phones. I asked the participants if they read with their mobile phones for pleasure in the classrooms, and they said they did not. Since that book club project, I have become interested in knowing how Costa Rican secondary Spanish teachers perceived the use of mobile devices to facilitate the teaching and learning process within the students in an environment with limited literary resources.

To develop a greater understanding of how mobile devices are implemented in Costa Rican by secondary Spanish teachers, I conducted a pilot study during the Fall of 2017 with twelve Costa Rican high school teachers from an urban technical school located near the northern Pacific coast of Costa Rica. To recruit the participants, I spoke with one principal of a Costa Rican technical high school and explained my research interest. The principal granted me permission to ask the secondary teachers if they were

willing to participate in the study and to provide insights about their perceptions regarding the use of mobile devices in the classrooms. Thus, twelve secondary educators teaching different subjects agreed to be interviewed for my pilot study. The interviews were conducted in Spanish and translated into English.

Based on this experience, the pilot study helped me shaped the research questions and refined the methodology of my present study. The pilot study also allowed me to develop a better understanding of what secondary Spanish teachers perceived regarding the use of mobile devices in the classrooms. Additionally, the pilot study allowed me to improve the interview protocol and determine what was relevant for asking secondary Spanish teachers during the interview process.

Background of the Study

At the time of this writing, Costa Rica is placed as the 42nd country in the world in Internet access across different educational institutions (Schawb, 2017). This is conducive to Costa Rica's educational system to promoting the incorporation of digital technologies the classrooms. Additionally, Costa Rica is ranked 12th country in the world for Internet subscriptions, where 66% of the population is using Internet through their smartphones and mobile devices (Melgar, 2016). Similarly, according to the statistics of iLifebelt (Melgar, 2016), research on the number of Internet users in Central America who connect to Internet using specific digital devices, 94% of the respondents stated they used their smartphone to meet this purpose. Likewise, the Costa Rican population quadrupled the use of Internet from 2013 to 2015.

In this regard, with the advances in telecommunication and cell phones in Costa Rica, the use of mobile devices and smartphones has become one of the main tools for

Costa Rican's citizens to access internet, communicate and engage in daily life activities. MEP's stakeholders are aware of the influence mobile technologies can have on the society and the need to integrate these mobile devices into Costa Rican's educational classrooms (MEP, 2016, 2018).

To this end, MEP has created programs that address the incorporation of mobile technologies in the classrooms (MEP, 2016; MEP et. al., 2017; Zúñiga, 2018). These programs seek to promote and provide a quality and innovative education to Costa Rican citizens with mobile devices. Thus, one of these programs is called *Programa Nacional de Tecnologías Móviles, Tecno@prender* [National Program of Mobile Technologies, Tecno@prender]. This program was created by the *Dirección Recursos Tecnológicos en Educación* [Direction of Technological Resources in Education] of the MEP to support the integration of mobile technologies across the different educational settings of Costa Rica (MEP, 2016; MEP et al., 2017; Zúñiga, 2018).

Along with the creation of programs to incorporate mobile technologies in the classrooms, MEP stakeholders established educational regulations for their successful integration (MEP et al., 2017; MEP, 2018). These new regulations enable educators across Costa Rica to provide a dynamic and innovative learning environment that is more meaningful for the learners (MEP et al., 2017; MEP, 2018). Equally, with these regulations, the MEP sought to provide access to mobile and digital technologies to all Costa Rican educational communities in order to develop cognitive, social, and digital skills to prepare learners face the modern world's demands (Zúñiga, 2018).

Sonia Marta Mora, former Minister of Education of Costa Rica during the period of 2014 to 2018, encouraged the incorporation of the mobile devices in Costa Rican

mainstream classrooms, especially in secondary education (MEP et al., 2017). This resolution was published in the official document DM-005-02-2016: *Lineamientos Generales para el Uso de Dispositivos Móviles Propiedad de los Estudiantes en el Centro Educativo* [General Guidelines for the Use of Mobile Devices Owned by Students in the School] that allowed Costa Rican students to use their personal mobile devices in the classroom settings (MEP et al., 2017).

Additionally, Sonia Marta Mora indicated that the major stakeholders in this initiative are the administrators, teachers, and students. These stakeholders should be working hand-in-hand to achieve the established goals in the current educational policies of the MEP (MEP et al., 2017). In this way, students can maximize the potential of the mobile devices and develop autonomy to learn in a digital and modern society (Díaz, 2018; MEP, 2016).

To this end, the MEP et al. (2017) added that "[the implementation of] mobile devices with [an appropriate] pedagogical mediation and support from administrative stakeholders and teachers can contribute to the development of new skills and competencies for life; [as well as, the development of citizens'] productivity and competitiveness" (p.10).

However, education in Costa Rica presents challenges that can hinder the successful integration of the mobile devices in classrooms. According to Núñez (2018), Costa Rican principals and teachers from primary and secondary schools are key personnel who should receive more professional training relevant to the incorporation of mobile devices. Similarly, it is necessary that Costa Rican public and private educational institutions have the needed resources to provide the classrooms with the appropriate

technological tools to enhance the learning process. Finally, there is scant research regarding the attitudes of teachers and administrators toward the use of mobile devices in the classroom, the impact of the use of mobile devices on academic achievement, or the effective alignment of the educational curricula with the 21st century digital skills when using mobile devices (MEP, 2018; Núñez, 2018; UNESCO, 2016; Zúñiga, 2018).

Statement of the Problem

The effective incorporation of the digital, information, and communication technologies (DICT) in the Costa Rican classroom is one of the main goals of the Ministry of Education of Costa Rica (MEP et al., 2017; MEP, 2018; Núñez, 2018; UNESCO, 2016; Zúñiga, 2018). The use of mobile devices to support the teaching and learning process inside and outside of formal classroom settings is becoming a widespread recommendation by upper-level administration, such as the MEP, in Costa Rica; however, there are challenges such as lack of resources and professional development needed to provide students with a quality and meaningful education (MEP, 2018; Núñez, 2018; UNESCO, 2016; Zúñiga, 2018).

To this end, the increasing consumption of mobile devices by Costa Rican citizens, such as smartphones, has allowed Costa Rican citizens across different ages to have more access to information and be digitally connected and entertained (Melgar, 2016). Since the smartphone and cell phones are popular mobile devices within Costa Rican population, stakeholders of the Ministry of Education have viewed them as a powerful learning tool for the learning process (Díaz, 2018; MEP et al., 2017). Additionally, stakeholders stated mobile devices should be employed inside Costa Rican classrooms to help students develop 21st century competencies and skills needed in the

digital era (Melgar, 2016; MEP, 2018; MEP et al., 2017; Núñez, 2018; Zúñiga, 2018).

However, the effective use of mobile devices to enhance teaching and learning practices requires key aspects to be incorporated as successful educational tools in the educational setting (Ertmer, 1999). One essential aspect that should be taken into consideration are teachers' attitudes and perceptions regarding the use of technologies in the classrooms. Acknowledging teachers' perceptions and beliefs are essential when successfully implementing technological practices in formal and informal settings (Ertmer, 1999, 2005; Ertmer & Ottenbreit-Leftwich, 2010). If teachers perceive technology is not appropriate for their teaching style, if teachers have had unfavorable experiences with technology outside their teaching practice, if teachers are not confident with the use of technology, and/or if teachers do not receive the appropriate support from the school administrators, they will likely be more reluctant to incorporate technologies into their teaching practice (Ertmer & Ottenbreit-Leftwich, 2010). In this case, knowing what Costa Rican teachers believe related to these factors about the use of mobile devices, such as smarthphones, in the classrooms is crucial to achieve the projected educational goals established by the MEP regarding the incorporation of the DICTs.

Previous studies in Costa Rica have provided limited perceptions on the use of mobile devices in education. Barrantes (2014) discussed how the mobile devices such as smartphones disrupted the students and hindered the stake testing process in Costa Rican's high schools. Barrantes argued that several teachers expressed students used their mobile device to cheat during the exam and do other activities not related to educational purposes. Additionally, secondary teachers in Costa Rica expressed the use of mobile devices was a distractor and a "headache" since teachers are not allowed to

take away the smartphones to their students (Barrantes, 2014; para. 6). Some of these concerns aligned with what secondary teachers expressed in the interviews during the pilot study I conducted in Fall 2017 in Costa Rica.

To conduct my study, I employed Leech and Onwuegbuzie's (2010) 13-step methodological framework for qualitative resarch. The steps I specifically used for this qualitative reasearch were as follows: (Step 1) determine the goal of my study; (Step 2) formulate my research objective; (Step 3) determine the rationale of my study; (Step 4) determine the research purpose; (Step 5) determine my research questions; (Step 6) select the sampling design; (Step 7) select the research design; (Step 8) determine the collection of data; (Step 9) determine the analysis of the data; and (Step 10) interpret data; (Step 11) legitimate data; (Step12) write research report; and (Step 13) reformulate research question. I explained Step 1 and 2 in the beginning section of this chapter when I set out the rationale and reason for why I am personally interested and invested in studying mobile devices in the Costa Rican educational context.

Philosophical Lens

Step 3: Determine the rationale of my study. The philosophical stance that led this qualitative research is a social constructivist paradigm. One position of social constructivism is that individuals construct knowledge by the social interaction, interpretation, and understanding (Vygotsky, 1962). Likewise, the creation of knowledge is bounded to the social environment where it takes place; in this sense, learning is viewed as an active construction of knowledge (Adams, 2006). Along with this, "constructivism adopts a relativist ontology (relativism), a transactional epistemology, and a hermeneutic, dialectical methodology. Users of this paradigm are oriented to the

production of reconstructed understandings of the social world (Durall & Lincoln, 2017). Understanding what Costa Rican secondary Spanish teachers perceive regarding the incorporation of mobile devices in the classrooms, allowed me to grasp the experiences educators lived and how they socially constructed their perceptions of these experiences depending on their points of view. Furthermore, the collaboration and cultural contexts are key to construct the knowledge of the surroundings we are living in (Adams, 2006). This is significant to bringing about change in the use and implementation of mobile devices and mobile learning in the Costa Rican context.

Purpose of the Study

      Step 4:Determine the research purpose of my study. The purpose of this study was to explore secondary Costa Rican Spanish teachers' perceptions of their experiences regarding the incorporation of mobile devices in the classrooms by conducting semistruture open-ended interviews to select secondary Costa Rican Spanish literature teachers to obtain in-depth information (see Apendix F). The participants of this qualitative study were 12 secondary educators teaching different subjects at an urban high school institution in the northern Pacific coast off of Costa Rica. A snowball sampling approach was employed to recruit the 12 participants. My research illuminates how Costa Rican secondary Spanish literature teachers perceived mobile devices in the clasasrooms.

      Futhermore, by examining the commonalities that my research participants expressed during the in-depth interview process, I determined several strategies that teachers use in the classrooms to effectively implement mobile technologies; however, in addition, I looked at what some of the barriers or challenges secondary Spanish teachers

encountered while implementing digital devices within their teaching practices. Finally, I sought to understand some of the advantages teachers found beneficial when using mobile devices in the classrooms.

Research Questions

       Step 5: Determine my research questions. The research question of this study were as follows:

1.   What are select Costa Rican secondary teachers' perceptions of their experiences regarding the incorporation of mobile devices in the classrooms?

2.   How do these perceptions of their experiences influence their likelihood of using mobile devices in the classrooms?

3.   How do these perceptions of their experiences influence their likelihood of banning (or not supporting) mobile devices in the classrooms?

Theoretical Framework: Unified Theory of Acceptance and Use of Technology (UTAUT)

       The theory that framed this study was The Unified Theory of Acceptance and Use of Technology (UTAUT). I decided to use this theory for the current study because of its comprehensiveness and detailed explanation of technology acceptance. This theory was formulated by Venkatesh, Morris, Davis, and Davis (2003), where they analyzed empirical and conceptual similarities between eight competing behavioral intentional models employed in research regarding technology acceptance. The UTAUT examined eight of the most regularly published theoretical frameworks to grasp the individuals' adoption of technology (e.g. Theory of Reasoned Action (TRA); Technology Acceptance Model (TAM); Motivation Model (MM); Theory of Planned Behavior (TPB); Combined

TAM and TPB (C-TAM-TPB); Model of PC Utilization (MPCU); Innovation Diffusion Theory (IDT); Social Cognitive Theory (SCT) where the most prominent characteristics of these models were comprised together to structure a unified model that explained individuals' technological adoption (Straub, 2009).

However, the UTAUT model has "four determining components and four moderators" (Chao, 2019, p. 3); which are PE, EE, SI, FC. These are the four determining components that were employed to do the discussion of the findings. Additionally, UTAUT encompasses four moderators: (h) age; (i) gender; (j) voluntariness; and (k) experience (Venkatesh et al., 2003). I described the seven first determinant constructs that were the foundation of this qualitative research.

Performance expectancy. "Performance expectancy is described as the degree to which an individual believes that using the system will help him or her to attain gains in job performance" (Venkatesh et al., 2003, p. 447). This is the strongest predictor on intention in both voluntary and mandatory settings, which also are moderated by gender and age. This theoretical point of view is based on extensive research regarding the influence gender and age. For instance, gender schema theory suggests that differences between genders derive from gender roles and socialization processes fostered since birth rather than biological aspects (Bem, 1981).

There are eight strong predictors identified for performance expectancy obtained from the comparison of the eight models of technology acceptance: (a) perceived usefulness; (b) extrinsic motivation; (c) job-fit; (d) relative advantage; (e) outcome expectations. Perceived usefulness is defined as the "The degree to which a person believes that using a particular system would enhance his or her job performance"

(Venkatesh et al., 2003, p. 448).

Effort expectancy. It is defined "as the degree of ease associated with the use of systems" (Venkatesh et al., 2003, p. 450). According to Venkatesh et al. (2003), the effort expectancy construct comprises three salient aspects found in the technology acceptance models such as: perceived ease of use, complexity, and ease of use. In addition, Venkatesh et al. (2003) stated that the effort expectancy construct is present in both voluntary and mandatory contexts. In this case, the effort-oriented constructs are more prominent in the early stages of the new behavior, when individuals need to overcome different challenges while dealing with technological issues; however, this behavior becomes less significant when individuals have to deal with technology for sustained usage periods.

Similarly, age and gender are considered moderators of effort expectancy. For instance, according to different studies the effort expectancy is more prevalent for women than for men and older workers (Bozionelos, 1996; Morris & Venkatesh, 2000; Venkatesh & Morris, 2000). Venkatesh et al. (2003) proposed: "effort expectancy will be more salient for women, particularly those who are older and with relatively little experience with the system" (p. 450).

Social influence. Social influence is defined "as the degree to which an individual perceives that important others believe he or she should use the new system" (Venkatesh et al., 2003, p. 451). Two important factors are at stake in social influence: voluntarily and mandatory contexts; which comprises three constructs obtained from the comparison of the eight models: subjective norm, social factors, and image. When an individual has to use technology in mandatory settings, reliance on other people's opinions influences

their behaviors towards the use of technology, in this case, rewarded or punished actions will affect the use of technology by individuals. To this, Venkatesh et al. (2003) added: "social influences appear to be important only in the early stages of individual experience with the technology, with its role eroding over time and eventually becoming nonsignificant with sustained usage" (p. 452). In addition, gender, age, voluntariness, and experience are moderators of social influence constructs when adopting technological practices.

Facilitating conditions. This construct is defined as "the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system" (Venkatesh et al., 2003, p. 453). Based on the eight models of comparison of technology acceptance, facilitating conditions comprised three core constructs: perceived behavioral control, facilitating conditions, and compatibility. Additionally, empirical results indicated that facilitating conditions influence the usage of technological devices and that technology usage is increased with experience as the users find multiple possibilities to get help and support from a teamwork or organization. Thus, the limitations to sustained technology usage might be reduced (Venkatesh et al., 2003). In addition, organizational psychologists have noted that older workers give more importance to the assistance and support they can get from others, which is a strong determinant of technological usage (Venkatesh et al., 2003).

Constructs theorized not to be direct determinants of intention. Self-efficacy and anxiety are not strong determinants of technology adoption. Venkatesh et al. (2003) expected that self-efficacy and anxiety behaved similar, but they are different from effort expectancy and do not have direct influence on "intention above and beyond effort

expectancy" (p. 455). On the other hand, attitude toward using technology is defined as "an individual's overall affective reaction to using a system" (Venkatesh et al., 2003, p. 455). In addition, Venkatesh et al. (2003) added "we consider any observed relationship between attitude and intention to be spurious and resulting from the omission of the key predictors (specifically performance and effort expectancies)" (p. 455).

Research Methods

The study was a qualitative interpretive phenomenological study. As mentioned prior, I followed Leech and Onwuegbuzie (2010) 13-step methodological framework for qualitative research to facilitate the process. In step 1, I determined the goal of my study was to explore select secondary Costa Rican teachers' perceptions regarding the incorporation of mobile devices in the classrooms. In step 2, I determined the research objective of my study was to ascertain select secondary Costa Rican teachers' perceptions of their experiences regarding the incorporation of mobile devices in the classrooms. In step 3, I established the rationale of the study by connecting my philosophical stance; social constructivism, and the relationship between the tenets of the paradigm with the nature of my study. In step 4, I determined the research purpose, which is to explore select secondary Costa Rican teachers' perceptions of their experiences about the incorporation of mobile devices in the classrooms through in-depth interviews. In step 5, I determined the overarching research questions of my study.

In step 6, I established that a snowball sampling approach was employed with a goal to recruit 10 to 12 participants. According to Noy (2008), snowball sampling technique is one of the most used technique across different social sciences disciplines. This technique is a "safety net or a fall-back alternative" to obtain information. This

technique provides a unique type of knowledge for the nature of recruiting the participants (Noy, 2008, p. 331). Therefore, I employed this technique to have access to different Costa Rican secondary teachers and collect unique information that they could provide for the study.

In step 7, I selected an interpretive phenomenological research design that led this study. The interpretive phenomenological research design seeks to provide a detailed description of the subjects' lived experiences related to the phenomenon studied (Giorgi & Giorgi, 2008). Employing interpretive phenomenological research, I attempted to explore the perceptions of the experiences Costa Rican secondary teachers had when incorporating mobile devices into the classrooms.

In step 8, semi-structure open-ended interviews were conducted with each of the ten participants to collect the data. I employed the semi-structure open interview to gather focused and in-depth data regarding the participants' perceptions of their experiences about the use of mobile devices in the classrooms. Mertler (2016) stated that with semi-structured interviews, the researcher follows a set of pre-established questions in a protocol; however, the researchers have the opportunity to follow up the participants' responses with more questions to obtain in-depth data. Follow-up questions were based on the researcher's perception about what information is most needed from an interviewee.

In step 9, I employed an interpretive phenomenological analysis (IPA), using first and second cycle methods, and themeing the data (Saldaña, 2016; Smith et al., 2009). Eatough and Smith (2008) stated that in IPA the researcher analyses and interprets the data provided by the participants to deeply understand the phenomenon under research.

Along with IPA, I employed the first and second cycle methods and themeing the data to code and analyze the information obtained from the semi-structured interviews (Creswell, 2013; Saldaña, 2016).

In step 10, I determined the form of interpreting the information. In this step, I used Creswell (2013) steps to analyze the information, where the process of analysis was analytic circles. Creswell (2013) described this analysis as a spiral process, where the researcher does not follow a fixed or linear data analysis. To complete this iterative process, I used NVivo12 software to code and visualize the data.

In step 11, I selected validation methods as data saturation, triangulation, member checking, and reflexivity. These validation methods were implemented in the IPA to make it plausible, trustworthy, and credible (Johnson & Christensen, 2014). Likewise, Creswell (2013) stated that validation and accuracy are pivotal for a qualitative study and the researcher, who decides if the data are appropriate for the type of research, gauges the validation methods. Finally, in step 12, I wrote the research report. In step 13, I went over my research questions and reformulated them for future study.

Significance of the Study

The incorporation of digital, information, and communication technologies is one of the main challenges and goals the Ministry of Education of Costa Rica (MEP) has established to provide a quality and meaningful education to the citizens (Zamora, 2012; Zúñiga, 2018). Since the world's societal dynamics are being influenced by the digital era, stakeholders at MEP have seen the necessity to incorporate digital practices in the conventional teaching activities to align the curriculum with the new demands of the 21st century (MEP et al., 2017; Zamora, 2012; Zúñiga, 2018). Consequently, Costa Rican's

teachers play a pivotal role in this quest because they are the facilitators of the

pedagogical mediation in Costa Rican's classrooms. Therefore, understanding the

perceptions of select secondary Costa Rican Spanish teachers had when incorporating

mobile devices in the classrooms, was fundamental to determine the advantages,

challenges, perspectives, and attitudes educators present towards the use of digital

technologies. The information gathered from this study will help stakeholders of the

MEP to continue restructuring and adjusting the Costa Rican curricula to meet the

immediate needs that teachers and students cope with in formal educational settings.

Additionally, the findings that I obtained in this research will assist secondary

teachers to understand other educators' experiences regarding the use of mobile devices

in the classrooms. This will be beneficial for educators who have experienced similar

situations, and who are attempting to successfully incorporate mobile devices in the

classrooms. Likewise, the findings of the study will add to the relatively non-existent

body of research on the perceptions of Costa Rican secondary teachers regarding the use

of mobile devices in the classrooms. The lack of research regarding the attitudes of Costa

Rican teachers towards mobile learning has been a concern that researchers and

stakeholders from the MEP have conveyed in other research findings (UNESCO, 2016).

Limitations

The limitations during the phenomenological study were as follows: (a) political

and economic issues affected teachers' self-perceptions concerning the incorporation of

mobile devices in the classrooms; (b) delayed permission to collect data by the former

departmental chair within the Institution Review Board (IRB) process; (c) findings might

not be transferable for different Costa Rican's population outside of Spanish teachers or

other Costa Rican regions, rurality of the schools, and socioeconomic status of the school (d) self-deception from the participants which could affect the research's findings; (e) researcher's' biases might interfere with the accurate interpretation of participants' perceptions.

Delimitations

Potential delimitations of the study are the selection time to conduct the participants' interviews. I decided the data collection to take place during Spring Break from March 11th until March 17th, 2019; however, because of delays in the IRB approval process, the data collection took place from April 20th until 30th, 2019. During these days, Costa Rican secondary teachers from the institution where I conducted the study were doing administrative duties, since the students from the region were taking Bachillerato make-up tests. Additionally, the study was confined to a secondary institution in a single city located in the northern Pacific Coast of Costa Rica. I chose this population because I have had the experience to work with students and teachers from this location; in this case, I had the opportunity to have access to the participants and collect data.

Definition of Terms

Artificial intelligence. The term is related to the capacity of different software programs to have a technological device develop activities or tasks simulating some characteristics of human intelligence; for instance, reasoning, discovering meanings, generalizing or learning from past experiences. Additionally, computers and other technological devices can control robots to perform projects similar as other human beings by using artificial intelligence (Copeland, 2018).

Blended learning. It is the combination of traditional classroom lessons with lessons that use computer technology by using Internet. This term is generally applied to face-to-face or online teaching experiences. For instance, students can attend to a traditional classroom setting and do online activities, such as: video-recorded lectures and live video and text chats that allow students to learn the content (The Glossary of Education Reform, 2013).

Digital era. Digital era is a term employed to describe today's era, in which digital technologies are used in almost every aspect of life. Users of digital devices connect with wireless technologies on a daily basis. This term also refers to the role that technologies play in today's world, where it controls behaviors, performances, societies, organizations, and individuals (Liyanage, 2012).

Digital technologies. Digital word is derived from the Latin digitus and finger, and it is related to one of the most ancient ways for counting. Digital technology has two processes; the information is stored in a binary combination with digits 0 and 1, which represents words and images. Additionally, digital technologies require of modern devices gadgets such as smartphones, laptop computers, tablets, and personal-digital assistants to perform different tasks such as compressing, transmitting, and processing vast amount of information in forms of bits (Digital Technology, 2020).

Informal learning. This is the type of learning that occurs out of institutions addressed to teach under a curriculum or specific educational objectives. This term can also be referred as self-directed learning and spontaneous learning that happens on the go. For instance, informal learning can take place at the jobs or a person's daily life activities without any premeditated intention. Informal learning is also associated to lifelong

learning and continuous learning, which are two important aspects of today's informed society (Guth & Petrucco, 2009).

Microblogging. This term refers to the brief and constant posting online on social media sites such as Twitter or Facebook. This is different than a traditional blog that are usually hosted on a custom website (Christensson, 2014).

Mobile device. This term is defined as any piece of electronic equipment such as a mobile phone, a laptop, and a computer that is portable and carry to different places (Cambridge Dictionary, 2020).

Mobile learning or m-learning. This refers as the learning that takes place with use of hand held and wireless devices such as mobile phones, tablets, laptops, or personal digital assistants (O'Malley et al., 2005).

Lifelong learning. This concept means the learning that happens in all the stages of life. This is the type of learning that is constant and that is embedded in different contexts of a person's life such as home, job place, and the community (Laal, 2011).

On-demand. When using mobile technologies, this term is employed to let users know that information can be accessed anytime and anywhere and as needed depending on the circumstances the individual presents (Cambridge Dictionary, 2020).

Online platforms. A range of services available on the Internet including marketplaces, search engines, social media, creative content outlets, app stores, communications services, payment systems (OECDiLibrary, 2020).

Techno-centric concept. This term refers to the emphasis and promotion of the value of technology. This term is used to describe individuals who are focused on technology as a means to do their different daily activities (English Oxford Living

Dictionaries, 2020).

       Ubiquitous learning. This phrase is regularly used in conjunction with learning when individuals access an array of information employing digital devices access anywhere and anytime. The new technologies and constant connectivity allow for learning opportunities to take place across different spaces and time (Merriam-Webster, 2020).

       Wireless technology. Wireless is a term that contains different technologies and devices that transmit data over the air rather than over wires, including cellular communications, networking between computers with wireless adapters and wireless computer accessories (Pinola, 2018).

Organization of the Study

This study is organized into six chapters as it follows: Chapter I: Introduction; Chapter II: Review of the Literature; Chapter III: Methodology; Chapter IV: Methodological Procedures in Context; Chapter V: Findings; and Chapter VI: Implications and Discussion. Additionally, I employed Leech and Onwuegbuzie's (2010) 13-step methodological framework to guide my study. In Chapter I, I used Steps one through five. In Chapter II, I conducted a comprehensive literature review, and I described the methodology I used to conduct the literature review step, which was based on the seven steps to a comprehensive literature review stated by Onwuegbuzie and Frels (2016). Subsequently, this allowed me to comprehensively analyze the literature related to my research purpose. In Chapter III, I used Steps 6: Sampling and Setting the Population; Step 7: Research Method; Step 8: Data Collection Procedures. In Chapter IV, I wrote the Methodological Procedures in Context in detail based on Gerber's (2019) ten recommended considerations, describing the process of the (a) IRB process; (b) getting permission to conduct the research in the institution; (c) recruiting participants; (d) interviewing participants; (e) translation and transcription of the interviews; (f) socio-political context of Costa Rica. Chapter V encompassed Step 9: Analyze Data. In Chapter VI, I employed Steps 10: Interpret Data; Step 11: Validating and Legitimating Data; 12: Research Report; and Step 13: Reformulate Research Questions that discussed the findings and stated possible future implications of the study.

Summary

Chapter I described in detail the following aspects: (a) Introduction of the study; (b) Background of the study; (c) Statement of the problem; (d) Philosophical lens; (e) Purpose of the study; (f) Research questions; (g) Theoretical framework; (h) Research methods; (i) Significance of the study; (j) Limitations; (k) Delimitations; (l) Definition of terms; and (m) Organization of the study.

Chapter II

Review of the Literature

Introduction

In the comprehensive review of literature chapter, I describe how I conducted the literature review following the seven steps for a comprehensive literature review (Onwuegbuzie & Frels, 2016). I described how I initiated the search that informed the process to obtain, classify, and determine which academic journals I used in my study. Additionally, I explained the process I implemented to obtain the themes and subthemes that helped me organize my literature review. Finally, I described in detail, each theme and subtheme I found regarding the topic under research.

Comprehensive Literature Research

In order to conduct a rigorous, exhaustive, and transparent literature review for my research, the seven steps recommended by Onwuegbuzie and Frels (2016) for a comprehensive literature review were used. In this process, different aspects were taken into consideration such as the quality of the databases, quantitative, qualitative, and mixed-method research, and the use of multimodal texts (MODES). According to Onwuegbuzie and Frels (2016), MODES stand for M: media; O: observations; D: documents; E: experts in the field; and S: secondary data. The seven steps to the comprehensive literature review are explained in detail in this introduction. Even though this method is presented in steps, the process for this literature review was not linear; instead, a circular and iterative process was implemented, where reflexivity, synthesis, and constant comparison of the research was applied (Onwuegbuzie & Frels, 2016).

Initiating the research. The steps followed to conduct the literature review were (a) Step 1: "exploring the beliefs and topics"; (b) Step 2: "initiating the search"; (c) Step 3: "storing and organizing the information"; (d) Step 4: "selecting and deselecting information"; (e) Step 5: "expanding the searches" (MODES); and (f) Step 6: "analyzing, synthesizing information" (Onwuegbuzie & Frels, 2016, p.54). Initially, the purpose of the literature review was established to begin the search. The focus of the literature review was to inform the audience about the topic under research.

Some keywords that I used in my searches regarding teachers' perceptions of their experiences about mobile devices in the classrooms included: (a) high school teachers' perceptions AND mobile learning; (b) high school teachers' beliefs AND mobile devices; (c) high school teachers' perceptions AND mobile devices AND Latin America; (d) high school teachers' perceptions AND developing countries; (e) high school AND mobile learning; mobile learning AND teachers' training AND Latin America; (f) high school teachers' beliefs AND mobile learning. Some terms not included are: NOT Higher Education, NOT Elementary School Level.

The conditions used to conduct the revision of the literature addressed the following aspects: (a) peer reviewed and non-peer reviewed articles; (b) quantitative, qualitative, and mixed methods studies; (c) educational contexts across selected areas, and current research. Databases used for the audit trail process comprised: (a) Education Resources Information Center (ERIC); (b) Humanities Full Text; (c) Academic Search Complete; (d) Education Source, Professional Development Collection; (e)Academic Search Complete in Spanish; (f) Teacher Reference Center; (g) Fuente Académica Premier; (h) Sage Journals; and (i) Jstor. In Table 1, the initial hits are displayed and the

number of the sample needed for review is listed for an appropriate synthesis of the

literature, based on sampling theory as outlined by Krejecie and Morgan (1970).

Table 1

Databases Used to Retrieved Information

Databases	Results	Sample Needed Selection
Academic Search Complete in Spanish	5	5
Humanities Full Text	7	7
Teacher Reference Center	8	8
Fuente Académica Premier	11	11
Education Resources Information Center (ERIC)	102	80
Professional Development Collection	108	80
Academic Search Complete	117	90
Education Source	220	132
Jstor	238	152
Sage Journals	980	274
Total	**1441**	**839**

Based on Onwuegbuzie and Frels' (2016) seven steps to a comprehensive

literature review, the table for "sample needed" (p.102) was used to obtain a

representative number of abstracts to read. Eight hundred and thirty-nine articles were

sampled and integrated in the summary table based on the sample needed for the article

selection. From the 839 articles sampled, 67 were selected using discrete criteria for

inclusion in the literature review. I employed the following criteria to select and deselect

the literature that consisted of the following:

- Mobile learning implementation in high school educational settings across

  different parts of western countries.

- Teachers' perceptions regarding the implementation of information communication technologies and mobile learning.

- Mobile learning salient characteristics and definitions.

- Mobile learning implementation in Latin America countries.

- Teachers' beliefs about technology integration in Latin America countries.

- Teachers' beliefs of digital technologies.

Other criteria I considered were that the articles were peer reviewed and recent regarding articles the topic under research. In this sense, the main volume of articles selected for the literature review were between the years of 2012 and 2018. However, I still included seminal articles and other articles that traced back to the beginning of mobile learning. Based on the aspects to select and deselect the information, 839 articles were scrutinized and 67 were eventually selected to be used for the comprehensive literature review. In the search process, I added several articles to support the themes I came across in the revision of the literature. This resulted in a total of 174 peer-reviewed articles, blogs, videos, and digital media sources used to create the comprehensive literature review.

To obtain the themes for the literature review, the abstracts of the articles were analyzed using Concept Coding. According to Saldaña (2016), "Concept Coding… has been referred to as "analytic coding" …Concept codes assign meso- or macro-levels of meaning to data or to data analytic work in progress" (p. 119). Next, the articles were categorized by themes and entered in a database for a better organization. Likewise, different types of documents were used in the process of the literature review, such as: (a)

dissertations; (b) conference proceedings; (c) books; (d) blogs; and (e) governmental

documents.

Themes that emerged from my analysis of the literature that are covered in detail

in the comprehensive literature review are: Overview of mobile learning, definition, and

salient characteristics; mobile devices implementation in formal and informal settings,

technology integration in the 21st century, teachers' pedagogical beliefs, teachers'

perceptions regarding mobile learning in western and Latin America countries.

Theoretical Framework

United theory of acceptance and use of technology (UTAUT). The advent of

new technologies has shifted the traditional educational paradigms, providing innovative

ways of learning (Traxler, 2013). The technological advances in todays' societies

provide opportunities for educators to implement digital practices in formal and informal

settings through the incorporation of technological gadgets (Khaddage, Müller, &

Flintoff, 2016). Along with this, teachers' acceptance of technologies has been crucial to

successfully integrate the information communication technologies (ICT's) in the

mainstream classrooms (AlTameemy, 2017).

Nonetheless, teachers' positive or negative beliefs about the incorporation of

technologies have resulted in successful or challenging outcomes when blending

traditional educational practices with new technological advances (Ertmer, 2005; Ertmer

& Ottenbreit-Leftwich, 2013, 2010; Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, &

Sendurur, 2012). Therefore, for the purpose of this research, the theoretical framework

that will be used to analyze the adoption of new technologies in the teaching practice is

United Theory of Acceptance and Use of Technology Theory (UTAUT) (Venkatesh et al., 2003).

The UTAUT models explains the users' technological acceptance (Straub, 2009). Over a decade ago the UTAUT examined eight of the most regularly published theoretical frameworks to grasp the individuals' adoption of technology (e.g. Theory of Reasoned Action (TRA); Technology Acceptance Model (TAM); Motivation Model (MM); Theory of Planned Behavior (TPB); Combined TAM and TPB (C-TAM-TPB); Model of PC Utilization (MPCU); Innovation Diffusion Theory (IDT); Social Cognitive Theory (SCT) where the most prominent characteristics of these models were comprised together to structure a unified model that explained individuals' technological adoption (Straub, 2009).

After a systematic and rigorous comparison among the eight models, UTAUT model "explains 70% of the variance in user intention" (Chao, 2019, p. 3); which makes the UTAUT model appropriate to investigate technology acceptance. The UTAUT comprises six main constructs of usage behavior and user behavior; for instance: (a) performance expectancy (PE); (b) effort expectancy (EE); (c) social influence (SI); (d) facilitating conditions (FC); (e) behavioral intention to use the system; and (f) usage behavior. Likewise, three other constructs are theorized as not direct determinants of intention such as: (e) attitude toward using technology; (f) self-efficacy; and (g) anxiety. These constructs "influenced behavioral intention to use a technology, while behavioral intention and facilitating conditions determine technology use" (Venkatesh, Thong, & Xu, 2016).

Four determinants were addressed in the discussion of the findings: performance expectancy, effort expectancy, social influence and facilitating conditions; which influenced the behavior of intention and usage behavior of teachers towards the incorporation of mobile devices in the teaching practice. The UTAUT model also included four moderators: age, gender, experience, and voluntariness. Each of these aspects rationalizes the adoption of technology and will be explained as follows.

Performance expectancy. First, performance expectancy is "the degree to which an individual believes that using the system will help him or her to attain gains in job performance" (Venkatesh et al., 2003, p. 447). This construct is one of the strongest predictors of behavior either in voluntarily or mandatory settings (Venkatesh et al., 2003). Coupled with this assumption, this accounted for the relationship between the teachers' beliefs and the incorporation of technologies for their teaching practice. In Ertmer et al. (2012) research, teachers' beliefs were predictors of teachers' technology adoption; if teachers perceived technology was not useful for their teaching practice, they were more reluctant to incorporate innovative practices in their instructions.

Out of the eight technology acceptance models, five constructs are the salient factors that describe performance expectancy (Venkatesh et al., 2003): perceived usefulness, extrinsic motivation, job-fit, relative advantage, and outcome expectations. First, perceived usefulness is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Venkatesh et al., 2003, p. 448). Thus, by using a technological device or a system, effectiveness, productivity and job-performance would increase. Likewise, Venkatesh et al. (2003) stated that gender and age factors moderated the relationship between performance expectancy and

intention, where gender and age's effect will be stronger for men, especially younger men. To this, Ertmer et al. (2010) stated that age plays a crucial role in teachers' beliefs when using technology that can also be supported by research where the successful incorporation of mobile technologies were influenced by the age of participants (O'Bannon & Thomas, 2014).

The second construct within performance expectancy is extrinsic motivation. This is defined as follows: "the perception that users will want to perform an activity because it is perceived to be instrumental in achieving valued outcomes that are distinct from the activity itself, such as improved job performance, pay or promotions" (Venkatesh et al., 2003, p. 448). Thus, this relates to the compensation technology users can receive if they implement any technological activity to perform a task.

Third, job-fit is defined as "how the capabilities of a system enhance an individual's performance" (Venkatesh et al., 2003, p. 448). In this case, the relationship between how effective can be any technological system to perform a job, might influence a user whether to implement it or not. Fourth, relative advantage is defined as "the degree to which using an innovation is perceived as being better than using its precursor" (Venkatesh et al., 2003, p. 449). This construct explains the relationship between the effectiveness and usefulness that a technological device or a system has to perform an activity. This has to do with the benefits that a technological gadget can provide to the users to make their jobs easier and productive. Finally, outcome expectations construct is related "to the consequences of the behavior. Based on empirical evidence, they were divided into performance expectations (job-related) and personal expectations (personal expectations)" (Venkatesh et al., 2003, p. 449). The usage of technology is conditioned

by the results that a technological gadget or a system might bring to the users' job or personal related tasks.

Effort expectancy. Effort expectancy is defined as "the degree of ease associated with the use of system" (Venkatesh et al., 2003, p. 450). The authors explained that effort expectancy is central in voluntary and usage contexts; however, Venkatesh et al. (2003) stated this construct is more salient in the early stages of a new behavior. When the adoption process involves difficulties in their adoption, the implementation tends to be eclipsed by instrumentality concerns.

Venkatesh and Morris (2000) established that this characteristic is more predominant for women than men. Gender roles and age could be predictors that influence the effort expectancy, especially for women (Venkatesh & Morris, 2000; Venkatesh et al., 2000) and older workers (Morris & Venkatesh, 2000). Thus, Venkatesh et al. (2003) stated that three elements were crucial in effort expectancy: gender, age and experience. Venkathesh et al. (2003) added: "we propose that effort expectancy will be most salient for women, particularly those who are older and with relatively little experience with the system" (p. 450).

Additionally, in effort expectancy there are three aspects that provide support: perceived ease of use, complexity, ease of use. Perceived ease of use is "the degree to which a person believes that using a system would be free of effort" (Venkatesh et al., 2003, p. 451). This is related to the users' notions related to the interactions with a technological device; for instance, learning to operate a device would be easy for the person, or, if a user would have the capabilities to interact with the technological gadget. Second, complexity is defined as: "the degree to which a system is perceived as relatively

difficult to understand and use" (Venkatesh et al., 2003, p. 451). This is related to the knowledge a user has to implement when using different technological devices. Finally, the ease of use is defined as "the degree to which using an innovation is perceived as being difficult to use" (Venkatesh et al., 2003, p. 451). This construct has to do difficulties and efforts it would take to interact with the different systems or technological devices.

Social influence. Social influence is defined as "the degree to which an individual perceives that others believe he or she should use the system" (Venkatesh et al., 2003, p. 451). The authors expounded that social influence is a determinant of a behavioral intention; in this case, Venkatesh et al. (2003) stated that none of the social influences constructs from the eight theoretical models were significant in voluntary contexts, but they became significant in mandatory contexts. To this, the social influence role in technology is an intricate phenomenon nuanced by different contingencies, where three mechanisms such as compliance, internalization, and identification affect social influence aspect.

Three constructs described social influence: subjective norm, social factors, and image. First, subjective norm is defined as "the person's perception that most people who are important to him think he should or should not perform the behavior in question" (Venkatesh et al., 2003, p. 452). In this construct, the affiliation that a person has to respected or cherished individuals would influence the behavior to fulfill others' expectations. Second, social factors construct is defined as "the individuals' internalization of the reference group's subjective culture, and specific interpersonal agreements that the individual has made with others, in specific social situations"

(Venkatesh et al., 2003, p. 452). This is related to the support and the degree other users

give to implement technological devices. If there is support, organization, and

management, the user would likely tend to use technological devices. Finally, image is

defined as "the degree to which use of an innovation is perceived to enhance one's image

or status in one's social system" (Venkatesh et al., 2003, p. 452). This is related to the

prestige a person might perceive he would obtain if he uses technological devices.

Additionally, this is connected to status and power that a user might reflect to others if

using technology.

Facilitating conditions. Fourth, the facilitating conditions aspect is defined as the

"degree to which an individual believes an organizational and technical infrastructure

exists to support use of the system" (Venkatesh et al., 2003, p. 453). This aspect is

comprised of three constructs: perceived behavioral control construct, facilitating

conditions, and compatibility. In perceived behavioral construct, concerns regarding

internal and external perceptions are involved. For instance, self-efficacy, resource

facilitating conditions, and technology facilitating conditions are contained in this

construct. Pertaining to facilitating conditions, the provision of technological gadgets

make observers agree that implementing them is an easy act to do. Finally, compatibility

is related to the potential adopters' perceptions regarding an innovation and its alignment

with existing values, needs, and experiences.

Additionally, Venkatesh et al. (2003) theorized that there are direct determinants

of intention, which are not related to self-efficacy and anxiety. However, these two

constructs are not determinants for intention; consequently, the authors expected these

two aspects would behave similarly; in other words, they are different from effort

expectancy without direct effect on intention beyond effort expectancy. Attitude, which is also a construct theorized not to be direct determinants of intention, is defined "as an individual's overall affective reaction to using a system" (Venkatesh et al., 2003, p. 455). This aspect includes attitude toward behavior, intrinsic motivation, affect toward use, and affect. Finally, the behavioral condition is seen as critical predictor of intentional use.

Mobile Learning History Overview

Mobile learning is a relatively new phenomenon that has emerged over the last decade (Crompton, 2013). This phenomenon has been gaining importance in the educational arena because of the revolution of learning and teaching practices that have occurred in the different educational settings during the last years, such as: (a) collaborative groups (b) iPads use, (c) drill and practice implementing applications; (d) digital game-based learning, (e) video recordings, (f) online research, (g) digital story creations; and (h) augmented reality (Crompton, 2013; Sharples & Spikol, 2017; Wishart, 2018). According to Pegrum, Oakley, and Faulkner (2013), mobile learning (sometimes called m-learning) is one of the fields of the information communication technologies (ICT's) that has quickly grown in the last years. Indeed, the increased use, affordability, and accessibility of mobile devices around the globe has afforded mobile learning relevance in the educational arena (Crescente & Lee, 2011).

The mobile world has permeated social, cultural, and educational practices (Ally & Prieto-Blázquez, 2014; Crompton, 2013; Khaddage, Christensen, Lai, Knezek, Norris, & Soloway., 2015; Merchant, 2012), revolutionizing and challenging conventional teaching approaches established more than a century ago, where the educator was seen as the content expert who transmitted the knowledge in mainstream classrooms;

nonetheless, this role has changed (Khaddage et al., 2015). Today's learners have access

to vast stores of information almost immediately through the use of handheld devices and

without the supervision of an instructor (Khaddage et al., 2015; Ramsay & Terras, 2015).

According to Sharples (2005), the re-conceptualization of the teaching practice in

the mobile era alters the idea of having a classroom restrained by wall boundaries, a set

curriculum, and transmission of knowledge or knowledge construction into a "cybernetic

process of learning through continual negotiation and exploration" (p. 6). As a result, a

new learning paradigm has surfaced, where users of the new mobile technologies benefit

from digital devices to learn, communicate, and interact across variety of contexts at

anytime and anywhere (Baran, 2014; Crescente & Lee, 2011; Merchant, 2012; O'Malley

et al., 2005; Traxler, 2007; Sharples & Spikol, 2017).

In the early 21st century, advances in global wireless technology, computer

innovations, and satellite systems have brought about countless possibilities for

individuals to be connected around the world (Ally & Prieto-Blázquez, 2014; O'Malley

et al., 2005). Poushter (2016) reported that the global median average rate ownership of

mobile devices in advanced economies is 88%, which suggests that a great number of

users who have access to information would result in more opportunities to interact and

learn in innovative ways. Regarding this matter, UNESCO, (2013b) have stated "mobile

learning has the potential to transform educational opportunities and outcomes" (p. 8),

promoting social and economic development within a variety of communities. Likewise,

Kemp (2018) asserted that in today's world over half of the population of the planet is

connected online. In 2018, the number of internet users was over 4 billion, with

projected increases of 7% each year (Kemp, 2018).

Based on current world demands, the educational curricula from diverse school settings should prepare learners to acquire and develop digital skills necessary to cope with the technological and societal changes (Sharples, 2005; Sheninger, 2015; Zhao, Zhang, Lei, & Qiu, 2015). Schawb (2016) stated that humankind is facing a technological revolution that will change people's lives, work, and inter-personal relations. Equally, Schwab (2016) mentioned that this revolution is characterized by "a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres" (para. 2). Indeed, the powerful mobile information communication technologies are an accessible resource that could support the rapid societal advances by leveraging its potentialities with educational purposes.

Technology has the capacity to connect places, people, and societies. It enables learners to obtain and create knowledge through devices, to fabricate new products with innovative digital systems, and to take advantage of artificial intelligence to serve individual's purposes (Schwab, 2016). According to Zhao et al. (2015), schools in the 21st century need to prepare digital citizens who are technologically literate, independent, critical thinkers, risk-takers, and innovators who can understand the nature of the evolving and changing digital world in which they live. In this case, the world's current demands require digitally skilled individuals (Schwab, 2016).

Definition of Mobile Learning

The concept of mobile learning is still developing, so there is still not a consensus definition for mobile learning (Crompton, 2013; Khaddage et al., 2015; Laouris & Eteokleous, 2005; Traxler, 2007). Some of the early attempts to define mobile learning was the conjunction of "e-learning with computational devices" (Quinn, 2000, para 1).

Quinn (2000) stated that the use of available technological resources with the capacity to search for information at different times and locations to support effective learning was considered mobile learning. One of the first pioneers to examine the potential of the use of mobile devices for educational purposes was the MOBIlearn project (O'Malley et al., 2005). This project defined mobile learning as "learning that takes place via such wireless devices as mobile phones, personal digital assistants (PDAs), or laptop computers" (O'Malley et al., 2005, p. 6).

Another early definition of mobile learning proposed by Laouris and Eteokleous (2005) contended that mobile learning is not simply the use of technological devices to have learning take place anywhere and anytime. For these authors, the definition of mobile learning involves a series of elements that conform the learning environment such as the learner, teachers, access to knowledge, curriculum and its learning activities, and the learner as part of a learning community. Additionally, the authors suggested that mobile learning should encompass the human, cultural, learning, and societal spectrum (Laouris & Eteokleous, 2005).

In the same fashion, Traxler (2005) defined mobile learning as educational conditions with the use of handheld or palmtop devices to lead the learning process. Nonetheless, Traxler also stated that the users and learners' perspectives were relevant to have a clearer idea of what mobile learning is rather than focusing only on a techno-centric concept (Traxler, 2005). Additionally, UNESCO (2013a) defined mobile learning as

The use of mobile technology, either alone or in combination with other

information and communication technology (ICT), to enable learning anytime

and anywhere. Learning can unfold a variety of ways: people can use mobile

devices to access educational resources, connect with others, or create content,

both inside and outside classrooms. (p. 6)

Khaddage, et al, (2016) defined mobile learning as "Mobile learning

accommodates and supports personal agency of the learner in a way that the learner can

decide when, where, and how he or she will learn; as such, mobile learning is

instrumental just in time and on demand learning" (p. 16). The authors expanded on

Crompton, Muilenburg, and Berge's m-learning definition that stated mobile learning

occurs through a variety of contexts, where social and content interactions take place with

handheld devices (Crompton et al. as cited in Crompton, 2013). For Kukulska-Hulme

and Traxler (2005) mobile learning is referred to as learning on the move while using

mobile wireless devices, such as: (a) cell phones; (b) smartphones; (c) palmtops; (d)

handheld computers; and (e) tablets. These varied definitions of m-learning have made it

difficult for researchers to adequately and accurately capture a clear definition of mobile

learning.

The beginning of mobile learning from 1970 to 2011. Before the incorporation

of mobile devices in education, technological devices, such as desktop computers,

allowed teachers and students to utilize these tools to support their learning and teaching

process (Crompton, 2013). According to Crescente and Lee (2011), the first wave of

educational technology began in the 1970s where there was only one computer for many

users. The second wave followed in the 1980s where there was one computing device

per user. The third wave came in the 1990s where handheld devices began to appear,

thus allowing collaboration, creation, and communication among users. Finally, the

fourth wave of the educational technology occurred in the new millennium. Here

wireless connectivity occurs amid digital devices that allowed users to access an array of

information and be in touch, surpassing the limitation of being in a fixed location and

different zone times (Crescente & Lee, 2011).

       The idea of mobile learning traces back to the Dynabook Project that began in the

early 1970s by the Learning Research Group at Xerox Palo Alto Research (Kay &

Goldberg, 1977). Administrators of the Dynabook Project foresaw the possibility that

every individual could own a portable device the size of a book that contained a realm of

information to be used for self-learning purposes. The Learning Research Group at

Xerox Palo Alto Research (Kay & Golberg, 1977) envisioned a device that could store

information to be useful for the learning of each individual who had one. However, the

technology to make the Dynabook Project possible was not available in the 1970s, nor

was there educational demand to develop these types of devices (Sharples, 2000).

       From the 1970s until 2000s, the implementation of mobile learning in educational

settings was scant (Chiang, Zhu, Wang, Cui, Cai, & Yu, 2016). According to Chiang et

al. (2016), most of the patents related to mobile learning the 1970s through the early

2000s belonged to enterprises that focused on students as their main target, as well as

educational supervisors, and service providers at schools. In these cases, the use of

mobile devices in the classrooms was not the dominant method of instruction, but

involved more out-of-class learning activities with the use of handheld devices. Chiang

et al. (2016), stated that from 2000 to 2004, it was an exploratory period, where research

centered attention on theory and early uses of mobile learning in the education process.

From 2005 to 2011, mobile learning applications in the educational fields experienced an

upsurge, where mobile technologies were used more for teaching and learning purposes, both inside and outside the classroom. This allowed the incorporation and investigation of the use of mobile devices for learning purposes (Chiang et al., 2016).

In the early 2000s, Sharples anticipated that because of the rapidly changing world, lifelong learning processes were not required to be tied to a specific location. Individuals could also study at a distance using on-line connection and broadcast media. Coupled with the lifelong learning concept, Sharples (2000) highlighted the role of the new technologies for learning to take place; he stated that "as learning has become more individualized and learner-centered, so too have the new digital technologies become increasingly personalized" (p. 179). The connection of the new technological advances was developing a new horizon for education and creating a new emerging concept: mobile learning.

Mobile learning from 2012 until the present. Currently, mobile learning is characterized by the applications and systems that support the education (Cosío, Khadagge, León, Bringas, & Cota, 2018). The applications contained in mobile devices are tools that can facilitate the process of teaching and learning process in different educational environments. Some of these applications have different functionalities that can serve to (a) interact and communicate with the students; (b) provide content; (c) have learners be engaged in the classroom activities; and (d) provide immediate feedback (Cosío et al., 2018; Durall-Gazulla, Gros-Salvat , Maina, Johnson, & Adams, 2012). Mobile learning might be advantageous to provide a meaningful learning to a wide range of students if implemented effectively across different educational contexts. However, the need to provide professional development to teachers who are reluctant to use

technology in their teaching practice, or who might lack of the technological skills to incorporate these digital tools in their classrooms, is crucial for their successful implementation (Ertmer & Ottenbreit-Leftwich, 2013).

According to Durall-Gazulla et al. (2012), the development of digital literacy skills is pivotal for any profession. In this case, the knowledge about mobile technologies for education is relevant in today's educational institutes to enable learners to use a variety of technological tools that may equip them to meet the needs of the digital era (Durall-Gazulla et al., 2012). Likewise, in the current mobile learning arena, the massive consumption of mobile devices coupled with the constant technological advances, requires education to (a) restructure the educational systems incorporating the use of digital technologies in the classrooms; (b) promote the development of the digital competencies in educators and students; (c) identify mechanisms that help teachers innovate their teaching practice implementing the ICT's; and (d) help students be critical about using the digital devices for their own learning (Durall-Gazulla et al., 2012; García-Valcárcel Muñoz-Repiso, & Martín del Pozo, 2016).

Salient characteristics of mobile learning. One of the basic premises of mobile learning is to provide the opportunity for the learner to gain information and assimilate it anywhere and at any time. The mobility and ubiquity that mobile devices provide allow users to assimilate content on-demand and at convenient environments (Peng, Su, Chou, & Tsai, 2009). Traxler's (2007) ideas resembled those of Peng et al. (2009), where he describes mobile learning as personalized, contextualized, and situated learning that allows the user to interact, collaborate, and retrieve information regardless of time and space. Additionally, Traxler and Kukulska-Hulme (2005) posited that some of features

of mobile devices that can support learning are: (a) portability; (b) connectivity; (c) storing information from device to device; (d) location awareness; and (e) accessibility.

In this fashion, the use of mobile devices has been gaining popularity in different educational settings because of the opportunities mobile learning offers when it comes to access to information, personalized learning, contextualized instruction, and learning that is "unrestricted by personal and special constraints" (Crompton, 2013, p. 47).

Mobile learning is ubiquitous and spontaneous thanks to the use of mobile devices. Vavoula and Sharples (2009) stated the use of digital devices allowed unplanned knowledge assimilation, where a number of activities like reading, writing, and discussing might happen in a non-fixed learning environment. Likewise, the size of the mobile devices promotes portability. In this case, learners can effortlessly carry their devices in their pockets to be used at their convenience. Mobile technologies can be used in a blended approach, where teachers can integrate them in their face-to-face class and informal settings (Khaddage et al., 2016). Additionally, Ozdamli, and Cavus (2011) stated that mobile learning has the characteristic of being private. Users of mobile technologies can handle their devices in a reserved way, independently from other learners, permitting a more personalized learning approach (Traxler, 2007, 2005). The interactivity between users and gadgets is relevant for mobile technologies (Ozdamli & Cavus, 2011). Learners are constantly connecting with other users who have digital devices, which is part of the new dynamics that modern technologies have brought about in today's societies (Merchant, 2012). Additionally, mobile learning devices are collaborative tools (Corbeil & Valdes-Corbeil, 2007). Not only can teachers and students collaborate using mobile devices, but they also have the facility to connect and interact

with other users, allowing for communication between people, who have the same work or learning interests or goals. Finally, mobile devices permit an immediate retrieval of information (Ozdamli & Cavus, 2011).

Implementation of Mobile Devices in Formal and Informal Settings

When examining the concepts of mobile learning, two important aspects emerge: informal and formal learning (O'Malley et al., 2005; Milrad et al., 2013). For Milrad et al. (2013), a formal learning context refers to the setting and the classroom dynamics that are controlled by the teacher. Informal learning occurs individually, where the learner becomes responsible for assimilating and accessing the knowledge anywhere with electronic devices without the direction or help of a teacher or formal classroom space (Khaddage et al., 2016). Traxler (2007) indicated that mobile learning attributes such as the unique learner's experiences, device ownership, informal use of devices and context of the use are strongly connected to informal learning, which differs from formal learning. For instance, some electronic learning (also known as e-learning) can be considered formal learning where electronic devices support the traditional educational practices (Crompton, 2013). The author explained that students are anchored to one context, either synchronous or asynchronous, to learn organized and structured information contained in online platforms that learners can access. However, Quinn (2013) conceptualized mobile learning as taking courses through a mobile device is rather restricted. Mobile learning conceptualization is related to the learners' performance and the ability to acquire different information individually using the potentialities of a mobile device across different spaces and time (Quinn, 2013).

The idea of blending formal and informal learning practices with mobile technologies has brought about a new learning ecology, where the benefits of bridging out-of-school and in-school learning activities may empower students' learning development (Barron, 2006; Lai, Khaddage, & Knezek, 2013). Research indicates that learners in informal contexts have the opportunity to access a variety of resources that the information and communication technologies (ICT) offer in today's societies (Furlong & Davies, 2012). Thus, Furlong, and Davies (2012) remarked that students have adopted learning practices that are not normally used in the mainstream classrooms, that in turn could be valuable tools to enhance and enrich students' skills and knowledge inside the school setting. According to the National Science Teachers Association (NSTA, 2012) Website, informal learning environments comprised different contexts, where learners access knowledge and interact with it. Some examples of these contexts are: (a) after-school programs; (b) aquariums; (c) museums; (d) zoos; (e) playgrounds; (f) libraries; and (g) students' homes.

As a result, teachers can use mobile devices across different settings (Gao, Luo, & Zhang, 2012; Waller, 2010). The findings of Gao et al. (2012) and Waller (2010) revealed how students engaged in microblogs like Twitter within different environments. The use of technology enabled students to have a wider perspective to witness that literacy practices do occur in the mainstreams classrooms, and these digital activities can blend with their everyday lives and routines (Khaddage et al., 2016; Lai et al., 2013; Merchant, 2012). However, a gap still exists between bridging formal and informal learning activities, preventing teachers from taking advantage of the new technological resources in their teaching practice (Khaddage et al., 2016).

Another example of how mobile devices can bridge learning across informal and formal environments is reflected in Sandberg, Maris, and de Geus' (2011) research. In this study, three groups of fifth grade students from diverse schools participated in this quasi-experimental pre-posttest design research conducted in the United States. One group of students received English language classes provided by the school, and the second and third groups received instruction with the same program using a mobile application specifically developed for this study. The application consisted of five different games that had various activities to assess the students' knowledge of 25 animals that inhabit in different continents. Students in fifth grade were provided with different T-mobile Pulse smartphones that included diverse features to run the mobile application to use at home and in school. It is noteworthy to state that the fifth-grade students had the opportunity to visit a zoo, where they had to use the mobile application.

Pre and posttests were administered; questionnaires and game logs were also used to collect data. In the first phase of the research, the authors administered a three-phase vocabulary pretest to the three groups, classifying the words into passive and active items. Results from the post-test revealed that the use of mobile devices was not more effective than the learning instruction, but the researchers reported children leveraged their learning process using mobile applications at home by playing the game in their free time. The authors stated that the fifth graders were highly engaged when playing with the mobile application (Sandberg et al., 2011). This study concurred with the findings of Pegrum et al. (2013), where school students from different elementary schools in Australia engaged in literacy practices using iPads. The participants had flexible

classrooms and did not have fixed desks, which allowed for collaboration and communication between the students and teachers.

Pimmer, Linxen, and Gröhbiel (2012) drew attention to the role of digital technologies in higher education contexts in a developing country to engage learners in formal and informal learning practices through social network sites (SNSs). This project took place in Nepal with university students enrolled in a nursing program and faculty members. The main purpose of this research was to understand the meaning that Facebook and mobile devices played in the participants' private lives for their learning and competence development. Data collections methods included focus groups with students and faculty members, and the analysis of a Facebook page focused on clinical matters. The researchers acknowledged they could not observe participants' private behaviors using the SNSs application while learning in informal environments; however, Pimmer et al. (2012) stated the interview analysis allowed for a deeper understanding of the teaching and learning practices between students and faculty members using digital technologies.

The results of Pimmer et al. (2012) revealed that students used Facebook regularly with their mobile phones to engage, communicate, and entertain. Regarding the learning aspect, Facebook contributed as a learning tool for the students, where they engaged in discussions about medical and clinical topics. Additionally, the participants took quizzes, shared medical cases, and exchanged media resources that helped them visualize and assimilate the content being discussed on the Facebook page. A noteworthy aspect is that the participants expressed that using Facebook was an interactive tool for learning and communicating, which allowed them to expand on their knowledge regarding medical

topics and other matters. However, according to the researchers, participants invested a majority of their time for social reasons, sometimes for informal learning and never for formal teaching. Nonetheless, according to the website analysis, Pimmer et al. (2012) found a high exchange of academic content, learning resources, and educational discussions in the different forums. The results of this study mirrored Khaddage et al. (2016) and Al-Hunaiyyan, Alhajri, and Al-Sharhan's (2016) statements regarding the potential that different applications and mobile devices have to enhance learning in informal and formal contexts.

Advantages of using mobile devices in formal and informal learning. Mobile devices have been used in different educational settings as powerful educational tools to enhance and enrich the learning and teaching practice (Crescente & Lee, 2011; Kukulska-Hulme & Traxler, 2007; Sheninger, 2015). For instance: (a) mobile devices allow teachers to be connected; (b) have access to an array of information; (c) enrich the learning process; (d) respond and react to the environment; (e) customize students' learning and teaching practices; and (f) be involved in an authentic culture of knowledge (Traxler, 2011). According to Ponners and Asim (2016), "the adoption of educational technology as part of designed learning environments has the capability to develop deep, interconnected learning content through the use of twenty-first century skills" (p. 63).

Some examples that reflect the previous statements are stated in UNESCO report in 2013. UNESCO (2013a) highlighted some of the positive benefits of mobile devices to tackle illiteracy in different underprivileged regions of the world by launching several projects like: (a) UNESCO Mobile Literacy Project; (b) the Ecosystems Mobile Outdoor Blended Immersion Learning Environments; and (c) Proyecto GEMA. These projects

contributed to the education of people across different countries with the use of mobile devices taking into consideration some of the most important educational issues lower socio-economic illiterate people confronted (UNESCO, 2013a).

In the same fashion, in 2009, the Nokia Life project was launched in several countries in Asia and Africa, bringing opportunities to a variety of societal groups to receive and have access to digital knowledge regarding health, education, agriculture, and entrepreneurship. These projects dealt with some of the most prominent social, environmental, and economic issues people from these regions were facing. The Nokia Life project consisted of providing innovative and personalized services to urban and rural consumers including children, teenagers, and adults, using Nokia cell phones with service at a very low cost. This made digital content highly affordable and accessible to ensure that different populations could be informed and make better decisions for their lives (Pshenichnaya & Clause, 2013; UNESCO, 2013a).

Another example of the value of mobile learning is Kukulska-Hulme and Traxler's (2005) analysis of 12 international case studies that shed light on three important aspects regarding mobile learning. In these studies, mobile technologies were incorporated in different teaching and learning experiences, where the authors identified those information and learning resources crucial for digital practices in and out-of-the classrooms. Additionally, the exploration of revolutionary practices in the teaching and learning process was another positive aspect throughout the case studies' process. Finally, the authors stated that the alignment of mobile practices with institutional and business goals was stressed in these studies (Kukulska-Hulme & Traxler, 2005). Equally, Attewell and Savill-Smith (2004) analysis of 27 reports including the incorporation of

mobile learning in the classrooms had similar findings as Kukulska and Traxler's analysis report (2005); however, this report provided more insights and recommended changes in the teaching and learning aspect.

Mobile learning advantages have been acknowledged in a number of studies. Including a variety of the advantages of mobile learning are the collaborative learning between students and teachers, narrowing communication barriers, blending mobile technologies into the e-learning approach, making learning more accessible to a large extended population (Hwang & Wu, 2014; Kukulska-Hulme & Traxler, 2005; Parsons & Adhikari, 2016; UNESCO, 2012). Some of the pertinent studies from several meta-analyses will be described in this review.

Baran (2014) conducted a meta-analysis of 37 journal articles addressing the implementation of mobile learning in teacher education from 2000 until 2014. The results indicated that mobile technologies were beneficial in teachers' educational contexts. For instance, mobile learning provided the potential to create a more contextualized, individualized, collaborative, and interactive teaching and learning environment that can equip teachers and students with innovative pedagogies. Similarly, in Crompton, Burke, and Gregory (2017) stated 62% of the 113 research studies of learning outcomes when using mobile devices in K-12 grades revealed positive academic gains. These results also resembled the findings of Cristol and Gimbert (2013), where the overall effect of using mobile gadgets on students' performance over standardized assessment was highly positive across different grade levels in the United States.

Koutromanos and Avraamidou (2014) conducted a meta-analysis addressing the use of mobile games in informal and informal learning environments to explore learners'

achievement and attitudes. The meta-analysis' findings revealed key aspects that were

perceived as beneficial for the learners' academic performance and teaching practices.

Across 11 studies that took place in Greece, specifically in primary and high school

environments from 2000 until 2013, handheld devices were used to play games to learn

and interact with a variety of content areas. Results indicated that mobile games were

highly engaging, provided a variety of learning opportunities and hands-on activities,

promoted collaboration and interaction between teachers and students, and developed

learning skills, such as creating arguments and debating. To this regard, researchers have

reported the use of mobile devices in the instruction increased motivation and

engagement among students, improved learners' academic performance, and allowed

knowledge construction via handheld devices (Ciampa, 2014; Hwang & Wu, 2014; Looi

et al., 2014; Pegrum et al., 2013; Sung, Chang, & Liu, 2016)

     Sung et al.'s (2016) meta-analysis and research synthesis about the impact of

mobile devices on students' learning performance shed light on some learning advantages

of mobile learning. These authors analyzed 110 experimental and quasi-experimental

journal articles published from 1993 to 2013 in varied recognized databases. The overall

mean effect size of the use of mobile devices for education was moderate. Among the

advantages of these technological devices in the teaching practice was that using mobile

devices in the classroom was better than using desktop computers. In this sense, inquiry-

oriented activities, game-based learning, self-directed learning, and cooperative learning

were more effective with the use of handheld devices rather than desktop computers.

Likewise, informal learning environments resulted as more advantageous than formal

learning environments. Another advantage that Sung et al. (2016) reported was self-

directed learning, such as learning vocabulary or using word-writing processors. The use of mobile gadgets concerning cognitive achievement had a moderate effect size; in other words, 69.95% of the learners outperformed the students who did not use mobile devices in their learning practice. Sung et al. (2016) stressed that using mobile technologies in the classrooms is more effective than applying traditional educational methods using pen-and-paper or desktop computers. According to Sung et al. (2016), the use of mobile learning eased the facilitation of affective learning outcomes within the students. The authors attributed this result as the opportunity to implement innovative teaching and learning experiences between different scenarios and experiences within and outside the classrooms.

Other researchers have supported the use of mobile devices for teaching content. For instance, Herro, Kiger, and Owens (2013) described a course for technical education credit in a Midwestern school district comprised of 5,200 students located in the United States. Two district teachers and a network technician attended a two-day online workshop that dealt with the creation of mobile games using Augmented Reality Interactive Storytelling (ARIS) developed by the University of Wisconsin-Madison. Mobile devices were funded by a local computer company, which also allowed the high school students to create their own apps using MIT App Inventor. During the creation of ARIS games and apps in the teaching process, students developed a variety of hands-on learning activities. These activities included the creation of a game to gain more knowledge about a local museum, uploading images, tagging places on Google Maps, and designing apps that comprised variety of digital and innovative features, where the students applied computer science concepts. Results from this case study suggested that

students and teachers could successfully create their apps and ARIS games resulting in innovative learning opportunities, as well as meaningful interactions between mobile devices and students' learning process. This case study resonated with the mobile learning characteristics that authors have previously mentioned, which relate mobile learning to a personalized, interactive, and collaborative learning and teaching experience (Ozdamli & Cavus, 2011; Traxler, 2007, 2005).

De-Marcos et al. (2010) conducted research to assess improvement and motivation in the learning process using a mobile application assessment tool. Three experimental groups and three control groups participated in this study: four high school groups from physics and technology courses ranging from 48 to 50 participants and two nursing courses with 28 participants from the third year of a Life Science degree at college level. The investigators created a web-based system to support mobile self-assessment for a mainstream class-based learning. This system had three main characteristics that consisted of a web server to administer and evaluate tests; a mobile application for students to have access to surveys and complete them, and a web-based front-end that provided necessary functions for teachers and students to use the system. The researchers tested the mobile application with a variety of cell phones that had different qualities; this application was suitable for students' phones. However, the mobile application only supported multiple-choice tests. In this case, the system was used to complement an existing learning action. Results from the study indicated an improvement in student achievement across the three experimental groups, suggesting that the incorporation of a new digital tool in the learning process may improve academic students' achievement (de-Marcos et al., 2010).

Challenges of using mobile devices in formal and informal learning. In formal and informal settings, knowing the various challenges within the application of mobile technologies for teaching and learning purposes is important for the appropriate implementation of mobile learning in the educational process (Khaddage et al., 2016). Khaddage et al. (2015) acknowledged four common challenges in their investigation of mobile technologies across both in school and out-of-school settings. These challenges are related to pedagogical, technological, research, and policy issues. In the pedagogical challenge, the authors stated that it is crucial in the instructional approach, where teachers and students get to know the potentialities of mobile technologies to support the education process. Also, Khaddage et al. (2016) indicated that teachers should be appropriately trained to maximize students' learning experiences, which will allow learners to transfer the digital skills to informal and formal settings and vice versa (Pegrum et al., 2013). Additionally, Khaddage et al. (2016) recommended that the curriculum be aligned to the current social needs, where the pedagogies enable students to think critically, solve problems, and act accordingly to the global and digital demands.

In the same fashion, different authors have indicated that the incorporation of mobile learning technologies in formal and informal settings requires a well-planned and well-developed curriculum. Curricula should promote blended educational approaches that support the new and changing technologies (UNESCO, 2013a, 2013b). For instance, Liu, Navarrete, and Wivagg (2014) implemented the use of iPods to improve language skills in English Language Learners in a two-year program implementation at a large school district in the United States. Additionally, the authors asserted that teachers' professional training was crucial to effectively implement mobile technologies for

educational purposes. Thus, primary and middle school students used the provided iPods to practice the target language and learn new content in class and at home. Nevertheless, teachers had to find the time to learn how to use the devices and plan activities that would allow students to use the iPods effectively. This method increased the work load for the teachers, who also had to deal with the technical issues the students encountered during the two-year mobile learning program implementation (Liu et al., 2014).

Other challenges that arise from the use of mobile technologies include the students' dependency on their digital gadgets (Leung, 2017). For instance, the use of social media among users, especially teenagers, has increased over the years (Lin, Zhang, Jung, & Kim, 2013). According to Sharples (2002), learners have been disrupted by the use of mobile devices in classrooms, diverting their attention from the learning purpose. Sharples, (2002) indicated that students create a communication state with the outside world that does not align to the teachers' practices and the curriculum. Consequently, this situation might create a conflict between what teachers expect students to do in class and what students actually do in the school setting (Sharples, 2002).

Relevant to this phenomenon is cognitive salient theory, which purports that students think about their phones and constantly check them even though they are not using them (Shuib, Shamshirband, & Ismail, 2015). Thus, some teachers have perceived the use of mobile devices as a distractor rather than an advantage for their teaching practice. For instance, 733 teenagers in Hong Kong participated in a mixed-method study regarding their dependency on their mobile phones (Leung, 2017). Participants in this research attended three secondary institutions serving students from 11 to 17 years of age. The adolescents completed a questionnaire on mobile phone dependency and some

of the teenagers were randomly selected to participate in focus group interviews regarding the effects of mobile phones. Three main results were derived from the confirmatory factor analysis. These results included: compulsive text messaging, making and receiving phone calls, and obsessive thinking about their phones. A noteworthy finding was that female participants presented a higher mobile phone dependency than males.

Along with the previous results, Terras and Ramsay (2012) investigated the psychological effects of the use of mobile devices on learners. In their findings, five central psychological challenges users might face when using the technological gadgets for mobile learning were revealed. The first aspect the authors mentioned was the "the context-dependent nature of memory" (Terras & Ramsey, 2012, p. 824). This psychological challenge states that mobility might interrupt the context awareness of learners, which may reduce encoding and recalling information; therefore, the authors highlighted the importance of the use of mobile devices in a cultural frame. The second psychological aspect is the limitation of the human cogntive resources. Terras and Ramsay (2012) conveyed that since learners are exposed to a wide variety of stimuli while interacting with mobile devices, they might deviate their attention that may prevent them from retaining information (Liu, Lin, Tsai, & Paas, 2012). Hence, Terras and Ramsay (2012) suggested learners should develop a control mechanism that helps them be focused on the activities they develop when using digital gadgets. For instance, if learners are skillfully controlled, they will not be distracted by the massive audio and visual stimuli they receive from the digital gadgets.

The third psychological aspect mentioned by the Terras and Ramsay (2012) is the distributed cognition and situated learning challenge. In this case, the authors explained the mobile users are interconnected and cognition is shared across artefacts, networks, and representation (Liu et al., 2012). Learners should be judicious when interacting with the vast content they might find in the virtual world. They should keep important infortmation and discard information that is irrelevant. Likewise, learners should take advantage of the distributed cognitive nerwork that mobile devices allow. The fourth psychological aspect is the metacognition skills needed for mobile learning (Terras & Ramsay, 2012). It is necessary that learners know how to control and be aware of their actions when using mobile devices.

Human executive functions play an important role when using mobile devices because they allow learners to master, be critical, and manage the behaviors while perfoming different tasks (Kane & Engle, 2002). Finally, Terras and Ramsey (2012) stated that the learners individualities are relevant when dealing with mobile learning. Learners do not have the same preferences and perspectives when using mobile devices. Consequently, learners may not have the same ideas about the use of mobile devices for learning purposes, which might hinder academic success for all of the users of mobile gadgets (Terras & Ramsey, 2012).

Regarding the technological challenge, Khaddage et al. (2015) identified some major limitations concerning the use of mobile technologies for educational purposes. First, there is a lack of technological infrastructure to seamlessly incorporate mobile learning in formal and informal school settings. Schools and learners may lack wireless connections to support all the learning tasks students and teachers may develop through

mobile devices (Khaddage et al., 2015). De-Marco et al. (2010) reported that one of the challenges while implementing web-based assessment through digital devices was technical issues related to connectivity, and the gadgets' limited capacities to fulfill the required tasks through the virtual space. To solve these issues, the researchers provided mobile phones with advanced features and technical support to run the application used in the study. Nonetheless, de-Marco et al. (2010) stated that this was an extra cost that learners were likely unable to afford. Likewise, in Barbour, Grzebyk, and Eye's (2014) case study with 11 high school students enrolled in an online course using their own mobile phone devices, they found that the students did not have the sufficient time and technological features to support the use of the Mobl21 application. Instead, these participants had to use desktop computers, where they could access an AP European History course provided by a virtual school in Turkey.

In the same fashion, Jahnke, Svendsen, Johansen, and Zander (2014) found a gap between what the teachers expect from the application of digital activities in their classrooms and the reality that occurs in practice due to technical problems (Ertmer, 1999, 2005; Ertmer & Ottenbreit-Leftwich, 2010; Ertmer et al., 2012). Teachers from Denmark who participated in the integration of the technology program experienced breakdowns while using tablets with their students such as interconnectivity and usage malfunctions. These problems hampered the workflow of tasks and promoted more complex tasks during the class' development. Janhke et al. (2014) reported teachers could make the students go back to their learning activities when they became troubleshooters and fixed the technical difficulties. However, other critical issues arose while the teachers were solving these problems such as students being off-task due to

checking social media and being distracted by playing video games (Leung, 2017).

Additionally, even though teachers perceived tablets as tools to enhance the teaching and

learning practice, they also were concerned about the importance to effectively handle

technical difficulties while using mobile devices (Khaddage et al., 2015). This is due to

the great complexity that technology adds to the teaching experience while using mobile

technologies *in situ* (Jahnke et al., 2014).

Other technical limitations that mobile technologies present are related to

usability. For instance, the small screen size, type of keyboard, device's capacity, and

short battery life are some drawbacks that can challenge the effective use of mobile

learning in formal and informal environments (Hwang & Wu, 2014; Kukulska-Hulme,

Sharples, Milrad, Arnedillo-Sánchez, & Vavoula, 2009; Kukulska-Hulme, 2012). These

limitations could be adverse when teachers try to combine mobile devices with their

teaching practice, preventing instructors from effectively incorporating mobile

technologies for learning purposes (Jahnke et al., 2014).

Technology Integration in the 21st Century Curriculum

Technologically enhanced pedagogies are the baseline that have provided the

framework for the incorporation of the mobile learning and teaching practices into the

contemporary classrooms. Leveraging from a series of ICT's frames, mobile learning

pedagogies have evolved into a more digital and mobilized educational concept. For that

reason, it is crucial to tap into some of the current technological educational approaches

that embody some principles to incorporate innovative digital practices in mainstream

school settings.

The new learning ecology concept. Today's schools require new educational paradigms to meet the increasing demands of the digital age (Lee, Spires, Wiebe, Hollebrands, & Young, 2015). Spires, Wiebe, Young, Hollebrands, and Lee (2012) proposed the emerging concept that combines computational activities with educational practices as a "new learning ecology" (p. 5). Due to the rapid technological advances, the education process is influenced by these new digital trends. The facility and constant access to vast stores of information, allow teachers and students to explore the world and different areas of knowledge with technological devices and internet connectivity (Spires et al., 2012). Hence, the concept of a new learning ecology views learning and teaching as multimodal and multidirectional model, where a complexity of activities can be carried out inside and out-of-school with the use of digital devices (Lee et al., 2015). "The new learning ecology provides new learning opportunities for students; greater understanding is possible as technologies are leveraged for ongoing learning actions" (Lee et al., 2015, p. 80).

This new learning ecology encompasses four important conditions for the teaching and learning process and describes the new learning ecology as follows: (a) immediate and constant access to information and a global community; (b) intensity, relevance, and personalization of learning; (c) highly developed student dispositions for self-direction, self-monitoring, creativity, and curiosity; and (d) highly developed teacher capacities for facilitation, improvisation, consulting, and mentoring (Spires, Oliver, & Corn, 2011). In this regard, it can be inferred that teachers are facilitators, where technological gadgets are the means to acquire the necessary information for the learning and teaching process. In addition, students should be enabled to use and develop digital

skills navigating from real to digital worlds, where they have the opportunity to solve

complex problems and become decision makers. In brief, Spires et al. (2011) added "this

type of ecology, which is dynamic rather than static, provides a range of learning contexts

for students as technological affordances are leveraged for ongoing learning actions" (p.

64). The curriculum also plays a crucial role, where the technological activities and

teachers' and students' needs meet the required digital demands from today's world.

        The technological pedagogical and content knowledge model (TPACK).

Likewise, another facet of pedagogy with digital aspects is the technological pedagogical

and content knowledge framework that determines the skills teachers should have to

integrate technology in an effective way (Sheninger, 2015). This model intertwines three

important forms of knowledge: content, pedagogy, and technology. This model

highlights the interconnection between the different bodies of knowledge that are

represented as: PCK (pedagogical content knowledge), TCK (technological content

knowledge), and TPK (technological pedagogical knowledge) (Koehler & Mishra, 2009).

Koehler and Mishra (2009) used these areas in the development of the TPACK model,

which provides a method to successfully integrate technology in the classrooms. This

model requires that educators grasp teaching as an interplay between their pedagogical

content knowledge and the application of this pedagogical content knowledge into the

unique circumstances of their classrooms or contexts using technologies and digital

practices. The authors also indicated that there is not "one best way" to integrate

technological activities in the classrooms; instead, an "integration of efforts should be

creatively designed or constructed for particular subject matter ideas in specific

classrooms contexts" (Koehler & Mishra, 2009, p. 62). Koehler (2012) concisely

explained the seven components of TPACK model as the following.

- Content Knowledge (CK): This is related to the subject matter teachers should

  learn or taught. The knowledge every teacher possesses differs from their

  teaching levels. In this case, teachers should have knowledge of theories,

  concepts, and ideas related to the content they teach in the different grade levels.

- Pedagogical Knowledge (PK): This construct is related to the methodologies,

  resources, educational processes and practices, and teaching and learning

  assumptions that teachers have.

- Technology Knowledge (TK): This concept is related to the knowledge of

  working with technology, tools and resources in educational settings; and the way

  these elements should be applied successfully at work and everyday life.

- Pedagogical Content Knowledge (PCK): This concept traces back originally to

  Shulman's (1986) thoughts of the pedagogy that is necessary to teach a specific

  content. Shulman also stated that teachers are the ones who tailor the content they

  teach to the students, adapting it to students' prior knowledge, educational

  contexts, instructional material and resources (1986). In brief, PCK encompasses

  teaching, learning, curriculum, and assessment.

- Technological Content Knowledge (TCK): This is related to the knowledge of

  technology and the way teachers should bridge the new technological practices

  with the subject matter they are teaching. Teachers should be cognizant of the

  best digital activities that suit their students' learning needs and styles, and

  successfully adjust them to reach that purpose.

- Technological Pedagogical Knowledge (TPK): This aspect describes how the teaching practice can change when using particular technologies in certain ways. This also involves knowing the technological affordances and limitations of the technological tools when adapting them to the learning activities and strategies.

- Technological Pedagogical Content Knowledge (TPACK): This concept is related to the skillful use of technology in the teaching and learning practice. The instructor needs to have a deep understanding of the technological concepts and their applications, and comprehend how they can be incorporated into teaching practice.

Teachers' Pedagogical Beliefs and Teaching Practice

Teachers' pedagogical beliefs play a pivotal role in their teaching practice (Ertmer, 2005). Richardson (1996) stated that beliefs are delineated by the psychological perceptions, principles, or assumptions that are considered true by an individual. Pajares (1992) also proposed that individuals' beliefs shape their world's views. In this case, when connecting beliefs along with pedagogical practice, Thornton (1989) stated that teachers are the ones who act as gatekeepers, controlling the educational activities, and the content developed in class. Likewise, Thornton (1989) added that these scholastic decisions are made based upon a system of beliefs and contextual factors that intervene in the different educational settings. Teachers' pedagogical belief systems filter new information and experiences according to the meaning and relevance educators add to them (Kagan, 1992). These viewpoints are strongly tied to teachers' personal and cultural milieu and cognitive constructs (Pajares, 1992). Pajares (1992) also stated that

teachers' beliefs affect their behavior in the classrooms, their understanding of teaching practices, and the criteria used to evaluate the teaching and learning process.

According to Ertmer and Ottenbreit-Leftwich (2010), teachers' pedagogical belief systems are complex and multi-layered, encompassing a "mix of rules of thumbs, generalizations, opinions, values, and expectations grouped in a more or less structured way" (Hermans, Tondeur, van Braak, & Valcke, 2008, p. 1500). However, core beliefs are stable and the most difficult to change because of their multiple connections to other assumptions and viewpoints (Richardson, 1996). Ertmer (2005) also stated that beliefs regarding the teaching and learning practice are difficult to change because they have been developed over several years of teaching experience and under educators' strong authority and consensus. This influences the way teachers design the pedagogical activities and the classroom dynamics, which in turn can be reflected in students' academic performance. Kagan (1992) found research-based evidence that supported how teachers' beliefs influenced their pedagogical practice. The findings of these empirical studies demonstrated that teachers' beliefs aligned with their teaching style and were frequently exhibited across different classrooms levels (Kagan, 1992).

When referencing teachers' beliefs, knowledge also plays a vital role (Ertmer & Ottenbreit-Leftwich, 2010). Calderhead (1996) stated that teachers' beliefs, knowledge, and thinking are incorporated in the concept of teachers' cognition; nonetheless, the author made a clear distinction between beliefs and knowledge. Calderhead (1996) categorized belief as a supposition, commitments, and ideologies; whereas, knowledge was explained as factual constructs and understanding. For example, teachers might gain knowledge about how to create and use spreadsheets to keep track of students' progress,

but it does not guarantee that they believe spreadsheets are effective for this educational purpose (Ertmer, 2005). In this regard, when there is a connection between the affective and the evaluative aspects regarding individuals' beliefs, different authors have concluded that beliefs tend to be more convincing than knowledge, particularly when organizing and defining tasks and problems (Kagan, 1992; Nespor, 1987; Pajares, 1992).

There is evidence that teachers' beliefs do not always translate into their teaching practice (Calderhead, 1996; Ertmer, 2005). Different studies demonstrate that teachers are inconsistent in the relationship between their beliefs and instructional practices (Phipps & Borg, 2009). For instance, in Phipps and Borg's (2009) research, three practicing English teachers working in a preparatory school in a medium-sized, private English-speaking Turkish university and they taught English grammar to young adults over a period of 18 months. The researchers observed and interviewed the participants, and their findings revealed that teachers' in-class grammar practices were not aligned with their beliefs regarding teaching English grammar. Some of the inconsistencies between educators' beliefs and practices were attributed to students' expectations and preferences, and classroom management (Phipps & Borg, 2009).

In Shifflet and Weilbacher's study (2015), inconsistent teaching belief and practice were evidenced. Results from the research revealed that two social studies teachers from Illinois differed in what they thought about the implementation of technology in the classrooms and what in reality they were doing when using technological activities for their classes. The authors concluded that the social studies teachers' beliefs were not strong motivators to overcome different barriers teachers perceived when incorporating innovative practices in the classrooms. This case study

research aligns with similar findings regarding discrepancies of what teachers believe should be educational practices developed in the classrooms and what they perform in reality (Chen, 2008; Kukulska-Hulme, Sharples, Milrad, & Arnedillo-Sánchez, 2006; Liu, 2011).

Teachers' Pedagogical Beliefs and the Integration of Mobile Learning in the Classrooms

In this new educational scenario that is characterized by the integration of ICT's in the classrooms and the pervasiveness of the use of mobile devices at a large scale, teachers have become agents of change in these digitized societies (Navaridas, Santiago, & Tourón, 2013). Teachers should be able to adopt innovative and revolutionary educational practices that align to the digital demands occurring inside and outside educational settings (Navaridas et al., 2013). However, Harris, Mishra, and Koehler, (2009) stated that incorporation of the ICT's in the classrooms is complex and involves multilayered connections between technology, pedagogy, and content knowledge. In this sense, digital practices are not likely to be successfully integrated by teachers if they still perceive that technological and curricular practices are disconnected (Hutchison & Reinking, 2011).

Additionally, Ertmer (2005) affirmed that whether or not and how to incorporate technology in the classrooms depends on teachers' will. If classrooms practices are to change, it solely depends on teachers' assumptions regarding the connection between teaching, learning, and technology use. Drawing on the assumptions, it is relevant to know how teachers' beliefs are at stake when integrating digital technologies in formal

and informal settings (Shuib et al., 2015) to understand their potential and overcome the barriers for their effective implementation (Khlaif, 2018; Makoe, 2013; Prestridge, 2012).

First and second order barriers to integrate technologies in the classrooms. In order to better understand teachers' perceptions regarding the implementation of mobile technologies, first and second order barriers for the integration of technology will be described. Ertmers' (1999, 2005) investigations about teachers' beliefs and technology integration has provided insights regarding how educators have faced challenges when incorporating new technologies into the classrooms. Ertmer (1999) classified first and second order barriers teachers encounter when incorporating technology in the curriculum, which also have nuanced their beliefs and teaching practices. Ertmer stated that teachers might acknowledge the importance of embracing technology in the classroom, but they also have to tackle fears, technical and logistical issues, and organizational and pedagogical concerns to integrate technologies in their curriculum. These barriers can be categorized as internal and external factors that influence the innovation and implementation efforts in the teaching practice.

According to Ertmer (1999), the first order barriers constitute the external obstacles that influence the incorporation of technology in the classrooms. For instance, the first order barriers are the resources teachers need to use technological devices such as equipment, time, training, and support. The second order barriers are the internal barriers related to the teachers' perceptions about the teaching, learning, and knowledge regarding the incorporation of technology in the classrooms (Ertmer, 1999). For Ertmer et al. (2010) the successful infusion of technologies in the classroom is related to a shift of teachers' mindsets. Ertmer stated that teachers should regard technology not only as

an educational tool that can enhance their teaching practice, but they also need to grasp that "effective teaching has to do with the incorporation of effective technology use" (Ertmer et al., 2010, p. 256). Thus, teachers should be able to know how to apply technology and its constructs to take advantage of its benefits to maximize the students' learning process. It is also necessary that teachers connect information to their real-life situations to promote meaningful learning environments.

Teachers' Perceptions about the Adoption of Technologies in the Classrooms

Tondeur, Braak, Ertmer, and Ottenbreit-Leftwhich (2017) synthesis of 14 qualitative study findings regarding the connection between teachers' pedagogical beliefs and technology integration provided a greater understanding of the interrelation and importance of beliefs and technology integration. Five synthesis statements from this research are described.

- Researchers found a bi-directionality between pedagogical belief and technology use. First, rich technology experiences undertaken by teachers were considered as enablers to change teachers' pedagogical beliefs towards the incorporation of digital practices in their curriculum. Teachers shifted their paradigms from a teacher-centered approach to a more student constructivist-driven approach. Second, teachers who had a more student-centered constructivist view were more likely to incorporate technologies in their practice.

- Teachers' with more traditionalist teaching practices tended to perceive technological practices less valuable for their teaching practice. As a result, the teachers' pedagogical beliefs and perceived barriers to the incorporation of technology in the classrooms limited the adoption of digital practices.

- Teachers' pedagogical beliefs regarding teaching practice aligned to the use of technology in the classrooms. Teachers who had a more student-centered view in their classrooms used technology for that purpose; whereas teachers who had a more teacher-centered practice used technology in more traditional ways.

- Professional development was a determining factor that allowed for the incorporation of technologies in the classrooms and had better understanding of the use of technology for their teaching practice.

- The context played a crucial role in teachers' adoption and use of technologies. Some school characteristics were determinant for teachers' integration of technologies such as policy, planning, technological and peer support, and school culture.

These statements align with Ertmers' (1999) first and second order barriers for technology integration, and should be taken into consideration when teachers integrate the new technological practices in their instruction.

Along with the previous assertions, Vongkulluksn, Xie, and Bowman (2018) stated that teachers' value of technology for their teaching practice is crucial for the effective technological adoption in the classrooms. Teachers who highly value the use of technology to support students' learning and classroom teaching improvement, will be more likely to maximize the resources and look for innovative teaching methods to overcome the first order barriers, rather than teachers who perceive technology as limitation for their teaching practice (Vongkulluksn et al., 2018). However, the impact of the first-order barriers (Ertmer, 1999) has prevented teachers from integrating technology in their classrooms effectively and has also influenced teachers' beliefs about the

incorporation of digital practices in the teaching practice (Ertmer et al., 2012; Kopcha, 2012; Miranda & Russell, 2012). Yet, once the first-order barriers are overcome, the second-order barriers become salient. Teachers' knowledge, skills, attitudes and beliefs play a crucial role in the quantity and quality of classroom technology integration (Ertmer et al., 2012; Vongkulluksn et al., 2018).

In Vongkulluksn et al. (2018) study, researchers examined how the school support for technology integration (first-order barriers) is internalized by teachers and how teachers relayed this support into their classroom technology integration practice (second-order barriers). The population consisted of 624 sixth graders to 12th-grade teachers and 20 administrators from various schools throughout a mid-western state in the United States. The participants were asked to complete an online survey regarding available technology resources, organizational resources, administrative leadership, and school culture that support classroom technology integration. The results revealed that teachers' values and beliefs moderated how teachers translated the school support into perceptions of supported on first-order barriers. Teachers' values and beliefs moderated and mediated the relationship between how teachers' perceptions and first-order barriers impacted the quantity and quality of technology integration. Indeed, teachers who believed technology was valuable tended to maximize the technological use in the classrooms and gave less significance to access constraints (Vongkulluksn et al., 2018).

Using survey research, Liu (2011) investigated the connection between pedagogical beliefs and teacher activities in conjunction with technology integration. 1139 Taiwanese elementary teachers were administered a survey that collected information about the factors influencing technology integration, pedagogical beliefs, and

teaching activities. Results indicated that teachers' pedagogical views are not necessarily translated into their teaching practice. Even teachers who had a learner-centered and constructivist pedagogical view, and who also were likely to integrate technology in their class, were more concerned about how students' academic achievement can be translated into skill-based knowledge attainment. In this case, these elementary teachers did not apply technological and constructivist activities in their classrooms even though they perceived themselves as being constructivist teachers. Liu (2011) attributed these results mainly to the teachers' lack of understanding of technology integration and the amount of time required to prepare a class that includes technological practices. These results also mirror the Ertmer's (1999) assumptions regarding the first order barriers to integrate technology.

On the other hand, research on the impact of mobile learning on students' learning, innovative practices, and mobile learning adoption has shed light on the multifaceted aspects that mobile technologies encompass (Ozdamli & Uzunboylu, 2015; Uzunboylu & Ozdamli, 2011). As previously stated, teachers' beliefs about education context, teaching methodologies, and students' learning styles have influenced their teaching practice (Kagan, 1992; Pajares, 1992; Prestridge, 2012). In this sense, the appropriate incorporation and use of mobile technologies in the teaching practice, relies on the teachers' judgement, assumptions, beliefs, and conceptions of mobile technologies (Cumaoglu, 2015; Gümüsoglu & Akay, 2017; Kearney, Burden, & Rai, 2015).

Regarding the adoption of mobile pedagogies, Kearney et al.'s (2015) mixed-method study, provided evidence on how educators use distinctive pedagogical features of mobile learning. For this research, the authors administered an online questionnaire

created for this specific purpose, where three particular dimensions were analyzed

regarding mobile learning pedagogies: authenticity, collaboration, and personalization.

Qualitative data were obtained through open-ended questions comprised in the online

questionnaire. The participants of the study included a total of 195 faculty and school

teachers from United States. The results of this research supported information

addressing the three previous dimensions already mentioned.

First, in the collaboration aspect, it revealed teachers were not likely to use mobile

devices for interaction. For instance, fewer than a 50% of teachers had students using

mobile devices individually. Authors attributed this result to the issue that mobile

learning adoption is not universal for all of the teachers; in this case, teachers may prefer

a face-to-face collaboration in the classrooms. Additionally, the use of certain

applications in the classrooms were over-used for drill and practice intentions; there was

a low rate of synchronous and networked collaboration between students. Indeed, this

result contradicts the assumption that mobile devices allow real time feedback,

immediacy, and extensive connectivity stated by different research (Traxler, 2007).

Second, regarding the personalization aspect, teachers indicated that students do

not have the opportunity to make decisions towards their learning process using mobile

devices. These results suggest that teachers still have control over the class, which also

conflicts with the assumption that mobile technologies enhance students appropriation of

their learning process (Traxler, 2007). Finally, the results demonstrated little evidence

that teachers leveraged the potential of mobile devices for learning purposes in non-

formal settings. In this regard, the authors addressed the importance of the idea that

teachers grant to "authentic activities" in their assumptions while implementing mobile technologies.

In sum, Kearney et al. (2015) stated that digital activities in the classrooms are nuanced by teachers' beliefs and attitudes towards the implementation of mobile technologies in formal and informal settings. These results also echoed with Cochrane (2014) and Corbeil and Valdes-Corbeil (2007) assumptions that owning a digital device does not imply or guarantee an effective or successful use of these gadgets in educational settings; teachers' beliefs are critical for the implementation of new technologies.

The role of knowledge in teachers' adoption of mobile devices. According to Ertmer et al. (2010), teachers' knowledge concerning the incorporation of technology in the classrooms has a major impact on their decisions. It is crucial for teachers to obtain additional knowledge to build on the Schulman (1986) PCK framework to include the digital practices in their classrooms. Therefore, teachers need information about digital practices as well as basic technological skills to provide meaningful activities, where they intersect content, pedagogy, and technology effectively. For example, teaching with technology requires educators to develop plans to teach software use to students, select appropriate technological activities that meet the curriculum necessities, and manage the hardware and software of technological devices (Ertmer et al., 2010).

In a mixed-methods study, Kim, Kim, Lee, Spector, and DeMeester (2013) administered a survey to 22 teachers from the southeastern portion of the United States to explore the beliefs of the nature of knowledge and learning, beliefs about effective ways of teaching, and technology integration practices. The results of this study indicated that teachers' beliefs about knowledge and learning were statistically significant when

correlated with the teachers' conceptions about effective ways of teaching. Additionally, the teachers' beliefs about effective ways of teaching were significantly correlated with the incorporation of technology in the classrooms. In other words, the knowledge teachers possessed about technological practices was found to be a strong predictor of the successful integration of technology in the classrooms.

In Wang, Hsu, Campbell, Coster, and Longhurst (2014) mixed-method study, middle school teachers' knowledge to use digital devices was crucial for their appropriate implementation. The purpose of this study was to explore how the common assumption those digital native generations surpass the digital immigrants regarding their technological experiences. The authors referred as digital immigrant teachers who are generally perceived less technologically savvy than individuals who were born in the spur of the digital era. The study comprised a population of 24 middle school science teachers and 1060 students. The data collection consisted a survey, focus groups, and comparison of teachers and students' inside and out-of-school technological experiences. The results of the study evidenced that the terms digital immigrants and digital natives may be misleading, since teachers out-of-school technological activities surpassed the in-class technological practices. Wang et al. (2014) stated that teachers might not implement these digital practices in their classrooms as a result of teachers' lack of confidence when implementing technological practices, lack of school support, and lack of recognized value to these types of ICT's.

Teachers from this study expressed five main barriers for the ease integration of technology; lack of access to technological resources, lack of time, lack of skills and strategies to integrate digital practices, lack of support and resources from school.

However, the main barrier for identified in the authors in this study was to teachers' lack of knowledge to facilitate and promote students' learning and technological skills. In this sense, even though teachers know how to use a variety of technological activities for personal work or daily life interests, they still lack the knowledge to appropriately merge ICT's practices with the curriculum.

Ng and Nicholas (2013) pointed out that unless teachers fully engage themselves with mobile technologies, using digital practices in their classrooms may not be successful. This depends on the teachers' knowledge of the mobile devices' capabilities and limitations, available applications, and knowing how to integrate them effectively. Ng and Nicholas (2013) expressed that integrating mobile technologies into mainstream classrooms is complex. There are different aspects that should be taken into consideration as the human factor.

Teachers' perceived self-efficacy to incorporate mobile devices in the classrooms. Coupled with knowledge, confidence in using the technological knowledge is also necessary for the successful incorporation of technological practices (Ertmer et al., 2010). Research has found that the use of technology in the classrooms was influenced by teachers' self-efficacy when implementing technological practices (Scherer, Siddiq, & Teo, 2015; Tilton & Hartnett, 2016; Yan & Piper, 2003). Pan and Franklin (2011) conducted an online survey with 559 teachers of K-12 from different regions of United States public schools to identify the factors predicting the use of Web 2.0 tools in classroom instruction.

The results indicated that self-efficacy when using Web 2.0 was the main predictor for the integration of technologies in the classrooms (Scherer et al., 2015). In

this case, the increase of self-efficacy was significantly correlated with an increase in the use of Web 2.0 tools. These results also resonated with studies by Chiu and Churchill (2016) and Kopcha (2012), where teachers perceived an ease of use and usefulness of technological practices in their classrooms after improving their digital skills through professional training. In these two studies, teachers received professional development that helped them develop digital skills to include the digital practices in their classrooms. Positive teachers' perceptions regarding the implementation of technology in the classrooms were obtained from these studies, after providing the necessary preparation to educators to increase their confidence and self-efficacy when using digital tools in formal settings (Chiu & Churchill, 2016; Kopcha, 2012).

As previously stated, teachers encounter different barriers to successfully incorporate mobile technologies across different educational settings (Chiu & Churchill, 2016; Ertmer, 2005; Ertmer & Ottenbreit-Leftwich, 2010). The barriers teachers have experienced have permeated teachers' attitudes, beliefs, and added-value towards technology (Ertmer, 2005). Kim et al. (2013) have expressed that teachers' perceptions of technologies is crucial for their acceptance and an effective way of teaching. Nonetheless, one of the effects teachers face while using technologies is anxiety (Bitner & Bitner, 2002; Celik & Yesilyurt, 2013; Chiu & Churchill, 2016). According to Celik and Yesilyurt (2013), teachers who perceive higher computer-self efficacy find the digital practices useful and ease of use for their teaching and are more likely to embrace them for their instruction.

In Chiu and Churchill's (2016) quasi-experimental study, 62 secondary teachers from Hong Kong took pre and post-questionnaires after teachers adopted a mobile device

instruction during 10 months. Teachers received training workshops to use the mobile gadgets. The participants were divided into two groups depending on the subjects they taught; language and humanities group and mathematics and science group. The results indicated that teachers had a positive attitude regarding mobile devices in the classrooms, but some of them still experienced anxiety when incorporating them in their teaching practices. Additionally, teachers who taught the different subjects had varied attitudes towards mobile technologies; thus, teachers who were in the mathematics and science group perceived the use of mobile gadgets as more advantageous than the group of humanities and languages teachers. The authors highlighted that not all of the teachers had the same attitudes, which suggest that these differences may be derived from culture, learning objectives, and subject areas (Makoe, 2013).

After practicing digital skills, the teachers experienced improvement in their attitudes or beliefs; in this case, if teachers gain more experience with digital practices, they will likely reduce their anxiety levels. This results mirrors Celik and Yesilyurt (2013) study, where the influence of professional development improved teachers' perceptions and anxiety levels towards incorporating mobile technologies in the formal settings. Finally, Chiu & Churchill (2016) stressed that what influenced teachers' attitudes in this research might be addressed to support the school policies.

Research to determine teachers' readiness and adequacy to integrate digital practices in the classrooms has also presented different positions of how teachers perceive mobile technologies in their teaching practice (Chiu & Churchill, 2016; Christensen & Knezek, 2018; Ozdamli & Uzunboylu, 2015; Uzunboylu & Ozdamli, 2011). Ozdamli and Uzunboylu's (2014) study compared teachers' and students' abilities

and perceptions concerning mobile learning. A population of 467 secondary teachers and

1556 students from 32 schools in Northern Cyprus completed an online questionnaire

designed to measure the aspects mentioned above. Results from this study indicated that

a successful integration of mobile technologies in the classrooms depends on an adequate

teachers' professional development that also echoes with Shapley, Sheehan, Maloney,

and Caranikas-Walker (2010) study, where one of the main aspects for the effective

integration of mobile learning practices in the classrooms is the need of professional

development. Additionally, the simple use of mobile pedagogies in the classrooms does

not translate into an effective teaching-practice (Cochrane, 2014); nonetheless, teachers

had a positive perception about mobile learning to support the traditional practices, which

is reflected on Lai, Hwang, Liang, and Tsai (2016) research.

In regard to the abilities to use mobile learning in the classrooms, the Ozdamli and

Uzunboylu (2014) research results demonstrated that teachers' skills are not sufficient to

successfully apply mobile technologies in their practices. These findings resonate with

Ertmer and Ottenbreit-Leftwich (2010) and Christensen and Knezek's (2018) studies,

where the teachers' readiness to effectively apply digital practices plays an important role

in how confident teachers feel in tailoring their teaching in a more innovative way.

However, researchers argue that it is critical that for the integration of mobile

technologies, there must be a shift in the educational paradigm; there is still a disconnect

between the current educational settings and the technological societies (Saavedra &

Opfer, 2012). It is necessary to bring about new pedagogies that align with the new

digital-learning approaches (Bannan, Cook, & Pachler, 2016).

Teachers' perceived benefits of the integration of mobile devices. The use of new technologies in the classroom has been perceived by some educators as beneficial for the teaching and learning process (García-Urrea & Chikani, 2012; Perrotta, 2012). For instance, in Perrotta's (2012) study, 683 teachers from 24 high school across England were administered a survey; the purpose was to investigate more about the experiences implementing digital technologies in the teachers' classrooms. These digital technologies comprised the use of digital devices, computer-based instruction, and technological gadgets such as whiteboards and overhead projectors. Results from the survey showed that a majority of high school teachers (89.6%) perceived that digital practices provided certain benefits for their teaching and learning process. In this sense, the teachers who were more inclined to incorporate digital technologies in the classrooms were those who previously received training on how to implement technology in the last two years.

Likewise, the authors pointed out a significant correlation in the results; the teachers who perceived more benefits incorporating digital practices in their classrooms also received more support from the school leadership. Perrotta (2012) stressed the importance that institutional support has over teachers' willingness to incorporate technology in the curriculum. This resonates with Ertmer's (1999) first-order barriers assumptions where it is stressed the necessity to provide support to teachers to sustain the technological practices in the classrooms.

In Purcell, Heaps, Buchanan, and Friedrich (2013) research of K-12 in the United States, digital technologies were found to be beneficial for teaching practice and students' learning process. The research comprised a population of 2,462 Advanced Placement and National Writing Project teachers in the United States. Results from these

surveys revealed that with the use of mobile technologies, students could complete assignments in the classrooms, access a wide range of information, collaborate in different writing projects, and improve communication channels between teachers and students. Additionally, 73% of the teachers stated that their students used their mobile phones in the classrooms and to do homework outside schools. Teachers let students use their phones to do research online and submit assignments online. Some other digital activities that teachers mentioned were relevant for their teaching practice were developing wikis, collaborative platforms like GoogleDocs, and participating in online discussions. A noticeable result is that 62% of the teachers expressed they received good support from their schools to integrate technological gadgets in their classrooms.

Regarding generational differences, teachers who were under 35 years of age were prone to use technology in the classrooms in comparison to teachers who were 55 and older. In this sense, 64% of teachers under 35 years of age considered themselves to be confident when using technology as opposed to 44% of teachers age 55 and older who did not perceive themselves as confident when using technology. Indeed, teachers 55 and older implemented more traditional practices and indicated their students knew more about technology than they did.

Teachers' perceived disadvantages when incorporating mobile devices in the classrooms. The incorporation of technology into diverse classroom settings does not guarantee learners will succeed in their academic performance (Cochrane, 2014). Even if teachers perceive technological tools as beneficial for the students' learning process and have a student-centered view, it does not guarantee that educators will use digital practices effectively in the classrooms (Ertmer et al., 2010; Liu, 2011). It is fundamental

to grasp the nature of educators' assumptions on how they believe technologies should be integrated into the curriculum, so educational stakeholders can provide teachers with the pertinent training and resources to take advantage of the full potential of technologies to improve learning and instruction (Kim et al., 2013).

In Carver's (2016) study, K-12 teachers perceptions were examined when providing 1:1 technology instruction. The participants comprised 68 students enrolled in online classes in education department of a private liberal arts institution in the southeastern United States, who were also teachers across different educational levels. The data collection method was a qualitative and quantitative online survey that analyzed teachers' perceptions on the use of different technological gadgets including laptops, iPads, and other technological tools for their instruction.

The results of the survey demonstrated that teachers found some technological features beneficial for increased student engagement in the classrooms; however, the major concern of teachers was technology availability, instructional time schedule, and pedagogical issues, which impacted teachers' perceptions regarding the use of digital technologies in their classrooms. These last aspects echo with Ertmer's (1999) first order barriers where the resources to use technologies are crucial to their successful implementation.

In Van Praag and Sánchez (2015) study, researchers found fundamental beliefs that hampered the inclusion of mobile technologies in the classrooms. For instance, some of these beliefs were related to the teachers' perceived role in the classroom, the impact of mobile technology on student learning experience, and the efficiency of technology use. In this research, three case study participants who taught English as a second

language in a school in the United Kingdom were interviewed, observed, and video recorded to gain a deep insight of the teachers' digital practices.

The analysis of the results demonstrated that in some moments the use of mobile devices was discouraged or prohibited; however, there were other instances where teachers supported the use of the handheld device for students to practice the target language. In other occasions, the use of the mobile device provided the opportunity to be implemented in the instruction, but teachers did not seem likely to use them. Additionally, the use of the digital gadget was at some instances tolerated, ignored and not noticed.

Teachers also expressed their opinions that the distraction factor was relevant when addressing the ease integration of ICT's in the classroom (Van Praag & Sánchez; 2015). This finding mirrored Thomas, O'Bannon, and Britt's (2014) study, where teachers found the use of cell phones in the classroom a highly distracting factor for the students (Sharples, 2002). In this sense, teachers were concerned about the students' access to social media; thus, educators suggested it is necessary they are provided with educational programs to address various scenarios that involve how to manipulate and use digital gadgets in formal settings.

Van Praag and Sánchez (2015) also found that teachers' prior experiences with technology may have shaped teachers' beliefs towards technology. On the other hand, in the same study, other teachers' beliefs facilitated the use of mobile technologies as the beliefs about pedagogical value of mobile devices and the professional value of mobile devices. In brief, teachers' beliefs towards mobile technologies were negative overall,

albeit there were a few teachers who accepted the use the mobile devices in the classrooms for some educational purposes.

Teachers' perceptions about mobile technologies are also related to their age and ownership (Cumaoglu, 2015; O'Bannon & Thomas, 2014; Purcell et al., 2013); which might be a limiting aspect to integrate digital practices. In O'Bannon and Thomas' (2014) study, researchers focused their attention on investigating teachers' age, support of use of smartphones, the perceived benefits of specific mobile features related to school work, and perceived barriers regarding instructional applications of smartphones. The participants of this research included 1095 teachers from southeastern United States with a mean age of 41.80.

The data collection methods comprised an online survey that the researchers designed for this specific study. Regarding the results 76.8% of teachers owned a smartphone and 23.2% owned a basic phone. In this sense, most of the teachers who were between 33-49 owned a smartphone and teachers who were older than 50 or more were less likely to own a smartphone. Teachers who presented less support to use smartphones in the classrooms were 50 and older, whereas teachers who were 32 and younger or 33-49 were more likely to apply smartphones' applications in their instruction. Regarding teachers' perceptions of smartphone's usefulness in their instruction, it decreased with age. In other words, teachers who were 50 or older tended to perceive smartphones less useful and more disruptive in comparison to the 32 or younger and 33-49 groups.

Concerning the perceptions about barriers using smartphones in the class, there was a statistical significance difference between age groups; especially the groups of 50

or more and the rest of the age groups. Teachers who were 50 or older perceived the barriers as more problematic than the younger groups. In sum, this study showed teachers who were 50 or older were more reluctant to include the use of mobile technologies in the classrooms. These results are similar to the findings of Purcell et al. (2013) where teachers 55 and older seemed more reluctant to integrate technological practices in the classrooms.

In Makoe's study (2013) older teachers from different parts of rural South Africa presented skeptical perceptions about the use of specific application in their cell phones for the teaching and learning practice. In this sense, these teachers perceived the use of digital gadgets as destructive tools that hampered the students' academic success (Cumaoglu, 2015). The results of this study also revealed that if teachers believe the use of cell phones does not help them improve their own learning process, it is likely they will not use them for their instruction. According to Makoe (2013), teachers' beliefs play a pivotal role in the successful integration of mobile devices in the classrooms; teachers' concerns and attitudes towards the technological gadgets should be taken into consideration to help them adapt innovative ways of instruction. These results aligned with Mac Callum, Jeffrey, and Kinshuk's (2014) study, where teachers who perceived technology as beneficial to their teaching and students' learning were prone to integrate mobile devices in their classrooms.

Teachers' Perceptions of Technology Integration in Educational Contexts of Latin America

The use of mobile technologies in across Latin American classrooms is still emerging. Initiatives for the incorporation of mobile learning are still infant; however,

UNESCO's efforts to understand how mobile technologies are integrated in the Latin American classrooms are shedding light on how these new technologies can narrow the digital divide and improve the quality of education in developing regions of Latin America countries (UNESCO, 2016). In UNESCO reports (UNESCO, 2012, 2016), Latin America mobile learning initiatives in countries such as Costa Rica, Argentina, México, Perú, Colombia, and Uruguay have been described.

Some of the conclusions these initiatives have provided are the necessity to establish policies that enable a sustained incorporation of ICT's in Latin American classroom is crucial. It is crucial for governments to invest in digital resources and provide support to the educational stakeholders to integrate digital technologies seamlessly. Deficiency of Internet connectivity and lack of digital resources are detrimental to the successful incorporation and sustainability of the ICT's in rural and urban schools of Latin America. Latin American educational curricula should be aligned and adapted to the new technological exigencies and 21st century skills. It is pivotal that instructors and educational stakeholders be aware of the pervasiveness and upsurge of digital technologies and the influence they have on the teaching and learning process. Finally, the necessity of professional development and support from the governments and different institutions to sustain the incorporation of ICT's in the classrooms is imperative to modernize conventional teaching/learning practices in the Latin America schoolrooms (UNESCO, 2016).

An extensive search of literature about secondary teachers' perceptions of their experiences regarding the implementation of mobile learning in the classrooms of Latin America was conducted; however, the information was scarce. Research related to the

incorporation of information communication technologies was more prominent in Latin America education. Therefore, this section addressed teachers' perceptions regarding technological practices across Latin America classrooms.

In developed and developing countries, the role of information communication technologies (ICT's) has had a profound impact on the way people learn, work, communicate, and entertain themselves, which has also influenced different economies, social lifestyles, and cultural expectations (UNESCO, 2017). In this sense, the integration of ICT's across Latin America has increased over the last years, which has brought about opportunities to Latin America citizens to be connected, informed, and updated (Rojas, Poveda, & Grimblatt, 2016; García & Chikhani, 2012). However, there is still a digital gap between different countries regarding access, resources, and infrastructure (UNESCO, 2017). According to Rojas et al. (2016), Latin American and Caribbean countries augmented the Internet bandwidth access 20% more than in the percentages registered 2010. Additionally, the penetration of Internet grew significantly among the population. This coverage increased from 7% to 58%, especially in the area of mobile technologies (Rojas et al., 2016). Nonetheless, according to this report, there is still a disparity between countries within Latin America regarding Internet access. For instance, the country that had a major development in Internet access was Costa Rica with 60% more than other countries in Latin America

The external conditions to incorporate the ICT's are still a drawback for many schools in Latin America, especially those institutions located in rural zones and low socio-economic settings (Álvarez-Quiróz & Blanquicett, 2015). For instance, in Perú 77% of urban schools have access to Internet, whereas only 1% of rural schools do. In

Costa Rica, the ratio is reversed, 88% and 97% or urban and rural schools have access to Internet; nonetheless, there is still a high percentage of schools that are not able to use Internet as a pedagogical tool (UNESCO, 2017, 2017). Even so, efforts have been made to promote the integration of technologies in the educational systems of Latin America, implementing different educational programs that allowed teachers to become acquainted with educational digital activities. On the other hand, for Latin American teachers to have access and information to technological tools does not necessarily translate into their use of ICT's in their classrooms. Thus, it is critical to know the factors that affect Latin American's teachers to implement technological practices in the curriculum (García & Chikhani, 2012).

Research about the use of technologies in Latin American's classrooms has found steady interest by teachers across different levels to incorporate ICT's in their teaching practice (Álvarez-Quiróz & Blanquicett, 2015; Guerrero, 2010). Teachers in various parts of Latin America have displayed a positive attitude toward the use of the ICT's. For instance, research was conducted by León (2012) in Ecuador on the effects of the project: "Improving the quality of public education for the strengthening of learning through ICT: Like father, like son". The study took place in three public schools at Provincia del Oro in Ecuador. These schools were selected because they encouraged of the use of technologies in the curriculum. The data were collected in the schools' second cycle with 3rd and 4th grades respectively.

The data collection methods consisted of observations and interviews with teachers, administrators, and principals. The findings of this qualitative research demonstrated that despite the schools' programs that promoted the inclusion of

technologies, the curriculum did not have objectives, content, or resources addressing the use of ICT's in the classrooms. Likewise, the students who were participating in these projects implementing digital technologies seemed motivated to learn using these tools. The students were engaged during the project and class development. Lastly, teachers seemed aware of the benefits of implementing ICT's in their teaching practice, but they also knew that they needed appropriate support to successfully implement ICT's. The author concluded that in order to successfully incorporate technologies into the teaching practice, the support received by educational stakeholders and teachers is crucial to address the first and second order barriers stated by Ertmer (1999).

Similarly, Álvarez-Quiróz and Blanquicett (2015) conducted research with teachers who worked in a rural region of Latin America, investigating how ICT's are integrated in the classrooms. The population consisted of 50 teachers from different educational settings from Boyaca and Cundinamarca in Colombia. The data collection consisted of interviews, stories of life, and focus groups. The teachers stated that ICT's were tools to facilitate communication, as well as to send and receive communication. In addition, the teachers stated it was necessary to provide professional development for stakeholders, especially in the rural areas.

García and Chakhani (2012) investigated teachers' perceptions of the incorporation of ICT's in their classrooms. A total of 524 elementary and high school teachers across eight different countries from Latin America received an online training course regarding educational technological practices. The Latin American teachers then took an online survey based on the User Acceptance of Information Technology model (UTAUT) (Venkatesh et al., 2003) and participated in virtual forums at the beginning of

their online training. This research shed light on the level of acceptance as well as perceptions teachers had toward the use of ICT's in their classrooms. Results indicated that teachers perceive the ICT's as useful to improve the quality of education as long as they are used adequately. Teachers in this study were also aware of the limitations and opportunities these technologies provide to the education; but in the end, their perceptions were positive.

In the same way, Latin American teachers perceived the use of ICT's as beneficial to enhance the teaching practice, communicate, and increase student engagement (García & Chikhani, 2012). Teachers stated that with the help of technology, they were able to use a variety of teaching methods because of array of materials, information, and pedagogical resources available with the ICT's. In addition, teachers indicated that with the use of ICT's, communication was more direct and effective with their students. Teachers believed that through technology, they could effortlessly communicate with their colleagues, supervisors, students, and parents.

Finally, teachers indicated that with the use of technology their teaching practices were less monotonous, which may help to engage students during the teaching practice. However, Latin American teachers were aware of the limitations they had in regard to their incorporation of ICT's in the classrooms. Some of the restrictions teachers mentioned in the research were the lack of time to prepare their lessons, including technological practices, the lack resources like digital devices for their classes or an adequate infrastructure, and the lack of professional development to prepare them to effectively integrate the ICT's in the teaching and learning process (García & Chikhani, 2012).

Integration of Mobile Devices Across Curricula in Costa Rica

Costa Rica has a high rate of literacy when compared to other countries in Latin America. There is a 96.1% literacy rate for people older than 15 years of age (UNESCO, 2016). According to the World Economy Forum, Costa Rica's quality of education ranks 27th among all the countries in the world (Schwab, 2017). This has positioned Costa Rica as a prominent country with high levels of scholarship in comparison to other countries of Latin America. One of the main goals of the education in Costa Rica is to offer a quality of education to narrow the gap between the different social classes (MEP, 2018).

The accelerated development of digital, information, and communication technologies (DTIC) is transforming the traditional educational practices, where learners access information and educational resources everywhere and at any time (Merchant, 2012). In this sense, the Costa Rican Ministry of Education is aware of the innovative and advanced educational activities that this phenomenon can bring into the curricula (MEP, 2018). According to the Global Competitiveness Report 2017-2018, Costa Rica is 12th in mobile-cellular telephone subscriptions per 100 population; 66% of the Costa Rican population is using Internet, thereby placing Costa Rica as 42nd in the world where schools have access to internet (Schwab, 2017).

Over the last ten years, the Ministry of Education of Costa Rica has been making efforts to integrate digital technologies in the classrooms (MEP et al., 2017). The outcome of the ICT's in the curriculum has been to provide a quality education to the different sectors of Costa Rican society (MEP, 2018). To tackle the new technological advances and successfully blend them in the public educational curriculum, the

Programa Nacional de Informática Educativa (PRONIE MEP-FOD) [National Program of Educative Informatics] was formed during the 90s, which comprised the Ministry of Education of Costa Rica and the private entity Fundación Omar Dengo (Fundación Omar Dengo [FOD], 2013; Zamora, 2012)*.* This decision placed Costa Rica among the leading countries in Latin America regarding the integration of ICT's across curricula.

The purpose of PRONIE MEP-FOD alliance was to integrate community and economic development in Costa Rican society through the development of intellectual abilities and technological skills (FOD, 2013; UNESCO, 2016; Zamora, 2012; Zúñiga, 2018). Several laboratories with computers across the country were provided to urban and rural schools of Costa Rica, as well as professional training and resources were given to the educational institutions to adopt the ICT's within their teaching practices (FOD, 2013; UNESCO, 2016; Zamora, 2012; Zúñiga, 2018). In 2010, the *Proyecto Redes Móviles para el Aprendizaje* (REM@) [Mobile Networks for Learning Project] was created under the supervision of PRONIE MEP-FOD alliance. This project consisted in a one-to-one model, where Costa Rican students from secondary schools worked with laptops individually.

The PRONIE MEP-FOD project encompassed three areas to integrate technologies into Costa Rican classrooms: the Area of Laboratories of Educational Informatics, the Area of Management and Technical Innovation, and the Learning Area with Mobile Technologies (UNESCO, 2016). From the former, *the Aprendizaje con Tecnologías Móviles en Escuelas Multigrados* (ATEM) [Learning with Mobile Technologies in Multi-grade Schools] project initiative was launched in 2012, which is a predecessor of the REM@ project. The ATEM project was implemented in Costa

Rican's multi-grade rural schools with the purpose to promote the development of problem solving and research skills as well as to foster the productivity and communication in the schools through the access of diverse technological tools inside and outside the educational contexts (PRONIE MEP-FOD, 2015).

A one-to-one model was implemented in the rural school classrooms, where laptops were provided to students, teachers, and schools' principals. These laptops also were allowed to be taken home by the learners, where parents consented to look after them and make sure their children used them for educational purposes. Additionally, other technological tools were provided to the multi-grade schools such as headphones, video cameras, a head-projector, and a technological gadget that transformed a normal whiteboard into an interactive one. The schools that did not have Internet access were provided with a wireless modem that allowed the connection to different websites; however, the connection was not the optimal in many schools to execute the different activities that required the use of Internet (UNESCO, 2016). The ATEM project lasted 3 and a half years and it reached 776 multi-grade rural schools across Costa Rica.

According to UNESCO (2016), there were a number of significant achievements of ATEM. First, the sustainability of the project throughout the three and half years of implementation in the multi-grade schools was successful, thanks to the support of educational stakeholders. A vast teamwork encompassing educational advisors, Costa Rica's Ministry of Education, teachers, parents, principals of the schools, and learners made it possible for this initiative to continue for this amount of time. Second, as a result of the use of mobile technologies, a reduction in the societal and digital gap was perceived. In this sense, digital technologies reached rural settings, where the use of

technologies was not attainable without the support of different educational stakeholders. Third, there was favorable reception from teachers, learners, principals of the different schools, and parents regarding the use of mobile technologies for the students' learning and teaching process.

Parents who were involved in this program were motivated and engaged in the different technological practices to support their children at home. Additionally, teachers' perceptions were positive toward the incorporation of mobile technologies in their teaching practice. The students seemed more engaged and motivated to learn using these technological tools in the classrooms. Finally, the students' academic achievement increased. The students were evaluated with a standardized test that gauged the students' knowledge regarding the use of digital technologies in the classrooms.

Nonetheless, the ATEM project also presented different challenges. First, there was a lack of appropriate conditions and resources to implement mobile technologies in the different school settings. Second, there was a lack of connectivity and a broad bandwidth in schools and homes. Third, parents were resistant for students to take the computers home due to fear of damaging them or losing them. Fourth, there was a lack of teachers' knowledge to implement technological practices in the classrooms. Teachers used the digital tools with a conventional approach; in this case, they used the laptops as an extension of their traditional teaching practices without fostering a more constructivist teaching process. In addition to this, the lack of professional training to help teachers develop their digital skills was evident during this project implementation. Even though efforts to equip teachers to use the mobile devices in the classrooms were attempted,

there was still a need to provide support and a sustained teacher training regarding the use of mobile technologies in the classrooms (UNESCO, 2016).

As a result of the development of technological advances and the digital demands, the Ministry of Education of Costa Rica created the *Dirección de Recursos Tecnológicos en Educación* (DRTE) in 2007 [Direction of Technological Resources in Education] (MEP, 2018). DRTE is in charge of the effective incorporation of the digital technologies in the Costa Rican public educational system (MEP, 2018). This entity is approved and included in the Costa Rican national plans *Plan Nacional de Desarrollo 2015-2018, Alberto Cañas Escalante and El Plan Nacional de Desarrollo de las Telecomunicaciones 2015-2021* [National Development Plan 2015-2018, Alberto Cañas Escalante and National Plan of Telecomunications Development 2015-2021].

The DRTE has developed *Programa Nacional de Tecnologías Móviles para la Educación* (PNTM) [National Program of Mobile Technologies for Education], which is also called Tecno@prender to maximize the incorporation of the digital technologies across the different educational settings (MEP, 2018). The goals Techno@preder proposed for the Costa Rican curriculum include the following: (a) to develop and sustain teachers' professional training; (b) to encourage creativity and innovation inside the mainstream classrooms; (c) to promote social equity; (d) to develop digital skills within the citizens; and (e) to incorporate digital technologies in the educational system.

Techno@aprender comprises eight models that encompass these different educational levels: (a)TecnoAcceso: students with learning disabilities; (b) TecnoAdultos: adult education; (c) TecnoBiblioCRA: school libraries and centers for information; (d) TecnoAmbientes: preschool level; (e) TecnoCole: secondary level; (f)

TecnoRural: rural schools; (g) TecnoConectándonos: multi-grade schools or unidocente (h) TecnoEducar: primary education of I and II cycle. These models hope to effectively integrate the use of digital technologies in the Costa Rica's curriculum (MEP, 2018).

DRTE program is still in its infant stages of implementation. The Ministry of Education of Costa Rica will employ in the current administration the eight models of Tecno@aprender program to successfully integrate the digital technologies. One of the main concerns regarding the implementation of this program is the lack of research about the incorporation of the digital technologies in Costa Rican classrooms (MEP, 2018); however, the Ministry of Education of Costa Rica expects this plan can effectively reach the country's entire educational population to narrow the societal gap, promote social equity and an informed population, and increase the country's economy through the development of digitally skilled Costa Rican citizens.

Regulation of the use of digital and mobile devices of students' property in Costa Rican secondary education. On February 23rd, 2016, Sonia Marta Mora, former Minister of Education of Costa Rica, required that the appropriate use of mobile devices inside and outside of the classroom setting should be regulated by each institution. This is the first regulation in Latin America that offered a conceptual and operational framework that helped secondary institutions to use mobile devices in the classrooms (Díaz, 2016; MEP et al., 2017). The name of this regulation is: *Normativa del Uso de los Dispositivos y Teléfonos Móviles en Propiedad de los Estudiantes en la Educación Secundaria en Costa Rica* [Regulations on the Use of Mobile Devices and Phones in Student Property in Secondary Education in Costa Rica] (MEP et al., 2017).

The Ministry of Education recommended that these regulations be adopted as a conceptual framework for the specific the reality of the schools' context. Each institution had to create its own set of regulations and procedures regarding the use of mobile devices to be incorporated into the institutional internal regulations. The use of smartphones in secondary schools was promoted as a way to encourage collaboration for the teaching and learning process. Additionally, it was stated that regulations should promote collaboration between students and teachers, where the educator is the one who leads in the use of the mobile devices (MEP et al., 2017).

Table 2

Antecedents to the Use of the Information Communication Technologies in Costa Rica's Education

Decades	Accomplishments
80's	Incorporation of the use of desktop computers for education under the command of Fundación Omar Dengo (June 19, 1980) [Omar Dengo Foundation]. Establishment of *Programa Nacional de Informática Educativa PRONIE MEP-FOD* [National Educative Informatics Program PRONIE MEP-FOD].
90's	Approval of the *Política Educativa Hacia el Siglo XXI* (1994) [Educative Policy Towards XXI Century]. This policy promoted financial support to expand and amplify the use of ICT's in secondary education. The expansion of the use of internet. Inclusion of the educative informatics for primary schools.
2000's	Qualitative changes in the teaching and learning process because of the use of digital and mobile technologies in the secondary classrooms. Creation of *Programa de Mejoramiento de la Calidad de la Educación General Básica PROMECE* [General Basic Education Quality Improvement Program] (2002-2012). Creation of *Dirección de Recursos Tecnológicos de Educación del MEP* (2007) [MEP Educational Technology Resources Institution]. Creation of *Proyecto Gobierno Digital* [Digital Goverment Proyect] (2002-2010). Establishment of *Fondo Nacional de Telecomunicaciones FONATEL* [National Communication Fond] (2008).

| 2010's | Establishment of digital social agreement to promote the use of digital technologies to close social gaps (2011). |
| | Creation of *Programa Nacional de Tecnologías Móviles del MEP* [MEP's National Mobile Technology Program] to help with the improvement of Costa Rican's education (2015). |

Note. Adapted from *Normativa del Uso de los Dispostivos y Teléfonos Móviles Propiedad de los Estudiantes en la Educación Secundaria en Costa Rica,* by Ministerio de Educación Pública, Fundación Telefónica, and Fundación Omar Dengo, 2017, p. 9.

The MEP's goals were to create environments where the use of mobile devices owned by secondary students become tools to promote learning and collaboration. This should be accomplished with the help of parents, community, and institutions' stakeholders that lead the secondary student generation towards a digitally and competitive world. The MEP made an urgent call to incorporate the use of mobile devices to engage secondary students in activities that motivate them, promote meaningful learning, and develop digital skills (MEP et al., 2017).

Furthermore, the appropriate use of mobile devices in conjunction with an adequate pedagogical mediation is a challenge that teachers and institution's stakeholders face in their teaching practices. Therefore, MEP offered a series of guidelines to help educators and stakeholders to use mobile devices owned by secondary students in the classrooms.

1. Empower educators as pedagogic mediators to promote the use of mobile devices in the learning and teaching process.

2. Encourage students' creative and innovative skills through the appropriate use of mobile devices reflected in the pedagogical mediation and lesson plans.

3. Stimulate spontaneity and creative activities (individually or in groups) to promote collaborative and learning environments.

4. Encourage the development of values, virtues, attitudes, and behaviors to use mobile devices appropriately inside and outside the classrooms.

5. Recognize, promote, and empower (a) educators' attitudes to use innovate teaching practices in of the classrooms; (b) students who would like to learn the use of mobile devices; (c) principals and stakeholders who promote the use of digital devices in the pedagogic mediation; (d) family engagement with the students' learning process (e) communities that help with the institutions' progress; (f) private and public institutions that involved with the improvement of the education.

6. Take advantage of students' mobile devices and internet to create knowledge and innovation in their learning practices, and to improve communication with families' and community members' involvement in educational development.

7. Create spaces in secondary institutions to promote learning, sharing environments, and innovation. (MEP et al., 2017)

The principals' role in each institution regarding the use of mobile devices is to provide the necessary conditions to allow teachers and students to use mobile devices with pedagogic mediation. These conditions determine the use mobile devices in the classrooms through needs assessment, planning, and executing the regulation of the use of mobile devices in the classrooms, and creating the appropriate conditions to promote the participation and the use of mobile devices in the classrooms. Principals' and stakeholders' responsibilities are to foster an environment that allows teachers and students use their mobile devices properly (MEP et al., 2017).

The teachers' role regarding the use of mobile devices in the classrooms encompasses (a) ensuring the appropriate use of mobile devices for educational purposes through the constant planning improvement and pedagogical mediation; (b) updating the technological resources of the classrooms when required by the pedagogical mediation; (c) incorporating the use of mobile devices in their lesson plans progressively; (d) promoting collaboration in the class; (e) sharing the educational outcomes in fairs and projects of the institution; (f) exchanging pedagogical experiences regarding the use of mobile devices owned by students in their teaching practices with other educators through the creation of virtual platforms; (g) informing stakeholders about the educational outcomes (MEP et al., 2017).

The students' role regarding the use their mobile devices should be centered on voluntary participation according to the pedagogical mediation established by the teachers. Additionally, students should take advantage of the Internet to acquire knowledge and collaborate with others. It is necessary for students to share their knowledge and experience regarding the use of mobile devices with their teachers to improve the educational practices. Students should also inform their families about the experiences using mobile devices in their learning process. Finally, students should share their mobile device with students who do not own one (MEP et al., 2017).

The institution's administrative board is also a crucial participant in guiding the appropriate use and implementation of mobile devices that students bring into the secondary institutions.

For instance, the institutions' administrative board should evaluate the necessary forms to get funds based on [1]6746 and 7552 laws, to provide the necessary pedagogical and technological resources for the institutions. The administrative board members are able to ask the MEP for funds through *Fondo Nacional de Telecomunicaciones* (FONATEL) [National Budget for Telecommunications] to provide scholarships and subsidies to equip the institutions with mobile devices. The administrative board can request the MEP to improve institution's Internet bandwidth for the use mobile devices inside the classrooms. Additionally, the administrative board can identify and determine which companies and private sector institutions can collaborate to acquire mobile devices for the secondary institutions (MEP et al., 2017).

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[1] 6746 law is *La Ley que Crea el Fondo Juntas Educación y Administrativas Oficiales* which is translated as The Law that Establishes the Budget for School's Boards and Official Administratives. Source: Sistema Costarricense de Información Jurídica retrieved from:
http://www.pgrweb.go.cr/scij/Busqueda/Normativa/Normas/nrm_texto_completo.aspx?param1=NRTC&nValor1=1&nValor2=33885&nValor3=35731&strTipM=TC

7552 law is *Subvención a las Juntas de Educación y Juntas Administrativas por las municipalidades*, which is translated as Subvention to the School Boards and Administrative Boards by the Municipalities. Source: Sistema Costarricense de Información Jurídica. Retrieved from:
http://www.pgrweb.go.cr/scij/Busqueda/Normativa/Normas/nrm_texto_completo.aspx?param1=NRTC&nValor1=1&nValor2=24953&nValor3=85853&strTipM=TC

Summary

In this comprehensive literature review, I addressed different themes regarding the perceptions of teachers regarding the incorporation of mobile learning and mobile devices across different educational contexts. This comprehensive literature review addressed research conducted in Western countries to provide the fundamentals to support the topic under research because of the scant research about Latin American teachers' perceptions regarding the adoption of mobile devices in the classrooms. In the first theme of this literature review, I provided a general overview of mobile learning history that included the following: (a) the definition of mobile learning; (b) the beginning of mobile learning from 1970 to 2011; (c) mobile learning from 2011 to the present; and (d) salient characteristics of mobile learning.

As a second theme, I addressed mobile learning implementation in formal and informal settings that encompassed (a) advantages of mobile devices in formal and informal settings and (b) challenges of mobile devices in informal and formal settings. As a third theme, I described technology integration in the 21st century curriculum that included (a) the new learning ecology and (b) the pedagogical and content knowledge model (TPACK). The fourth theme was teachers' pedagogical beliefs and teaching practice. This theme included the following subthemes: (a) teachers' pedagogical beliefs and the integration of mobile learning in the classrooms; (b) teachers' perceptions about the adoption of mobile technologies in the classrooms; (c) the role of knowledge in teachers' adoption of mobile learning; (d) teachers' perceived self-efficacy to incorporate mobile technologies in the classrooms; (e) teachers' perceived benefits of the integration of technologies; and (f) teachers perceived disadvantages from incorporating mobile

technologies in the classrooms. The last theme described was teacher's perceptions of

technology integration in Latin America that included mobile devices integration in the

Costa Rican's curriculum.

Chapter III

Methodology

This chapter provides a detailed description of the research methods, research questions, participants, data collection methods, data analysis, and the summary of the methodology. As stated in Chapter I, this study sought to explore the perceptions of the experiences of select Costa Rican secondary Spanish teachers regarding the implementation of mobile devices in their classrooms. For the research process, I followed Leech and Onwuegbuzie (2010) 13-step methodological framework for qualitative research. I used the following steps from this framework in chapter III: (Step 6) selecting the sampling design; (Step 7) selecting the research design; (Step 8) collecting the data; (Step 9) analyzing the data; and (Step 10) validating/legitimating the data.

This chapter describes in detail (a) selecting the sampling design; (b) selecting the research design (c) collecting data; (d) analyzing data; and (e) validating/legitimating the data. For the purpose of this research, I employed Interpretive Phenomenology as a research design; which suggests the researcher is as much a part of the research as the participant, and that the researcher's ability to interpret the data was reliant on previous knowledge and understanding. The overarching research question for this study are the following:

1. What are select Costa Rican secondary teachers' perceptions of their experiences regarding the incorporation of mobile devices in the clasrooms?

2. How do these perceptions influence their likelihood of using mobile devices in their teaching?

3. How do these perceptions influence their likelihood of banning (or not supporting) mobile devices in their classrooms?

Step 6: Sampling and Setting of Population

The goal of this study was to explore the perceptions of the experiences of select Costa Rican Spanish literature teachers regarding the incorporation of mobile devices in the classrooms. As this is interpretive phenomenological research, the intention was not to generalize the findings to a larger population, rather the objective was to provide a detailed analysis of the participants' unique experiences and perceptions (Johnson & Christensen, 2014). A snowball-sampling plan was employed to recruit the participants of the study. Johnson and Christensen (2014) described snowball sampling as "each research participant who volunteers to be in a research study is asked to identify one or more additional people who meet certain characteristics and may be willing to participate in the research study" (p. 265). Snowball sampling was a suitable type of sampling to use for this research because the participants of the study ascertained and provided information about other Costa Rican secondary Spanish literature teachers who have experienced similar phenomena.

Other researchers use different names for snowball sampling process. For example, Miles, Huberman, and Saldaña (2014) called this method "reputational case selection," where participants' or experts' recommendations are considered when choosing the potential research participants (p. 32). Miles et al. (2014) asserted that using these sampling techniques "increases confidence in analytic findings on the ground of representativeness" (p. 32).

The participants recruited were secondary Spanish literature teachers from one urban high school from the western coast of northern Costa Rica. Dukes (1984) recommends interviewing 3 to 10 participants in a phenomenological research; thus, I recruited 12 participants employing snowball sampling to get a deeper understanding of the phenomenon studied. These participants were interviewed and asked if they knew others who were interested in participating. The site for the study was selected based on my prior pilot studies and observations. The incorporation of mobile devices in the teaching practices of secondary classrooms is increasing in importance in the region, and these teachers had knowledge regarding the changes and challenges of this phenomenon.

To have the initial contact to recruit participants through a snowball sampling technique, I sent a letter to the principal of an urban high school institution from the western coast of northern Costa Rica and asked for permission to recruit participants for the study. Once I got the permission, I personally asked teachers if they were willing to participate in the research study. When I located one participant, I asked him or her to assist me in identifying another potential participant. In order to minimize the risk of potential violation to the participants' privacy, I asked each participant if he/she could provide contact information to locate another potential participant. I provided a folder with the documentation provided to the participants, in which I added the researcher contact information, the purpose of the study, and a consent form where the participant agrees to participate in the study.

Step 7: Research Method

This study explored the perceptions of the experiences of selected Costa Rican teachers regarding the implementation of mobile devices in the classrooms. For this

investigation, the research design was based on a qualitative approach using an interpretative phenomenological research design (Giorgi & Giorgi; 2008).

Phenomenology. The term phenomenology was used in early 1700s in the writings of Kant and Hegel (Moustakas, 1994). For Hegel, the concept of phenomenology "referred to knowledge as it appears to consciousness, the science of describing what one perceives, senses, and knows in one's immediate awareness and experience" (Moustakas, 1994, p. 26). In other words, this is described by Kockelmans (1967) as the "absolute knowledge of the absolute" (p. 24). According to Heidegger (1977) the word phenomenon comes from the Greek "phainesthai", which means to "flare up, to show itself, and to appear" (p.74). Phenomenon is also constructed from the Greek word "phiano" that means "to bring to light, to place in brightness, to show itself in itself, the totality of what lies before us in the light of day" (Heidegger, 1977, p. 75).

Other definitions of phenomenology are stated as follows. For Creswell and Poth, (2018) phenomenology "describes the common meaning for several individuals of their lived experiences of a concept or phenomenon" (p. 75). Lunenburg and Irby (2008) asserted that in phenomenology "the researcher is concerned with clarifying the specific and recognizing phenomena through the eyes of the participant" (p. 90). Additionally, Eatough and Smith, (2008) stated that phenomenology "is concerned with the way things appear to us in experience; the reality that we live is an experiential one and it is experienced though practical engagements with things and other in the world, and it is inherently meaningful" (p. 180). Finally, Moustakas (1994) added that "empirical phenomenological approach involves a return to experience in order to obtain

comprehensive descriptions that provide the basis for a reflective structural analysis that portrays the essences of the experience" (p. 13).

The phenomenological approach has been used to conduct research in psychology as a way to understand the individual's experiences. There are different methods of phenomenology to conduct research in the first decade of the twenty-first century such as: (a) Gohethean pre-philosophical experimental phenomenology; (b) grass-roots phenomenology; (c) interpretive phenomenology; (d) descriptive pre-transcendental Hursselian phenomenology; and (e) Hursselian phenomenology based on a return from transcendental (Giorgi & Giorgi, 2008). However, for the purpose of this research and to provide a clearer idea of phenomenology, I focused on transcendental phenomenology and interpretive phenomenology, which are two of the most common phenomenological methods in the phenomenological research arena.

Transcendental phenomenology. Edmund Husserl, a German mathematician, promoted a philosophical phenomenological method at a level of scientific practice, where the examination of the research' phenomenological data would result in a philosophical analysis rather than a scientific one (Giorgi & Giorgi, 2008; Reiners, 2012). According to Moustakas (1994), for "Husserl, as for Kant and Descartes, knowledge based on intuition and essence precedes empirical knowledge (p. 26). However, Husserl's work was influenced by Descartes' insights; in the sense that Husserl focused on the concept of epoché, which means, "set aside our prejudgments, biases, and preconceived ideas about things" (Moustakas, 1994, p. 85). Husserl asserted the researcher in a phenomenological study has to bracket himself from the reality under research to portray the participants' experiences with an open mind; in this case, it would

allow the researcher "to enter anew into consciousness, and to look and see [experiences] again, as if for the first time" (Moustakas, 1994, p. 85). Husserl acknowledged the importance of coming back to the self-discover, the essence, the meaning, and the nature of things or experiences because this would allow to describe the phenomenon in all of its quintessence (Moustakas, 1994). This phenomenological research is called transcendental phenomenology, where the researcher suspended all suppositions, used his consciousness, and described the meaning of reality based on the individual's experiences (Reiners, 2012).

Additionally, Husserl expressed the belief that descriptions in transcendental phenomenology have to be preceded by a reduction (Schmitt, 1959). Husserl used this reduction as not attaching the researcher's beliefs to the objective world; in other words, the researcher's performance is a spectator that is neutral and "changes his practical aims" (Schmitt, 1959, p. 239). The reality becomes a pure phenomenon; however, the researcher is the one who claims those experiences in the real world as valid (Moustakas, 1994). According to Schmitt (1959), Husserl distinguished the terms epoché and transcendental. Husserl referred to epoché, as "the suspension of all-natural belief in the objects of experience… [Transcendental] is the precondition for reducing the natural world to a world of phenomena (Schmitt, 1959, p. 240). Additionally, Schmitt (1959) defined transcendental phenomenology: "it uncovers the ego for which everything has meaning in existence" (p. 240). To this, Moustakas (1994) added, "The object that appears in consciousness mingles with the object in nature so that a meaning is created, and knowledge is extended. Thus, a relationship exists between what exists in conscious awareness and what exists in the world" (p. 27).

Interpretive phenomenology. Husserl's student Martin Heidegger (1889-1976), argued that the phenomenological method was interpretive (Giorgi & Giorgi, 2008). In this case, both Husserl and Heidegger, agreed that phenomenology involved description and interpretation, but they disagreed on which was the primary method to follow (Giorgi & Giorgi, 2008). Husserl's and Heidegger's views of their research philosophy differed greatly. Heidegger saw himself as an ontologist, where ontology relates to the theory of existence, or to put simply, what it means to be human. On the other hand, Husserl's position was based on epistemology, which addressed the theory of knowledge or how knowledge is acquired, or to put simply, what it means to know (McConnell-Henry, Chapman, & Francis, 2009). Heidegger emphasized Dasein where "the question of being arises and its task is to interpret the meaning of being" (Giorgi & Giorgi, 2008, p. 167). In this case, for Heidegger's interpretive phenomenology, it did not employ Husserl's reduction term; instead, Heidegger focused on being rather than on consciousness (Giorgi & Giorgi, 2008). Tuohy, Cooney, Dowling, Murphy, and Sixsmith (2013) added that interpretive phenomenology "is also referred to hermeneutics… [which is employed] to understand and interpret participants' experiences" (p. 18). To this regard, hermeneutics "moves beyond the description or core concepts of the experience and seeks meanings that are embedded in everyday occurrences" (Reiners, 2012, p. 1).

In interpretive phenomenology researchers do not bracket their biases and prior knowledge of the phenomena under research (Giorgi & Giorgi; 2008; Reiners, 2012; McConnell-Henry et al., 2009; Smith, Flower, & Larkin, 2009). In its place, the researcher needs to uncover the individual's life through the lens of culture and socio-historical meanings because people are continuously embedded in a world that contains

meaning (Eatough & Smith, 2008; Smith et al., 2009). According to Heidegger, bracketing is not possible in interpretive phenomenology, since the researcher's previous understanding and knowledge (fore-structure) aids with the interpretation of participants' lived experiences (McConnell-Henry et al., 2009; Smith et al., 2009). In this sense, Heidegger contended that "the researcher is as much of the research as the participant…He postulated that there is no such thing as interpretive research, free of judgement or influence of the researcher" (McConnell-Henry et al., 2009, p. 9).

Therefore, the research design of interpretive phenomenology allowed me to provide an interpretation of the select Costa Rican teachers' perceptions of their experiences regarding the incorporation of mobile devices in the classroom.

Step 8: Data Collection Procedures

Procedures. During the interviews, I interviewed each participant at a location where the interviewee and the interviewer agreed to meet (Creswell, 2013). This setting had the necessary conditions to conduct the interview, such as a quiet place with the least distractions and a secure and comfortable environment for the interviewee and the interviewer. I followed the steps stated by Lunenburg and Irby (2008) to conduct an interview: (a) explain the purpose of the interview; (b) provide a consent and confidentiality form to the interviewee; (c) explain how the interview will be conducted; (d) indicate the time the interview will take; (e) allow the interviewee to ask questions regarding concerns about the interview; (f) explain the procedures to record the interview data; (g) clarify the interviewee about the notetaking process.

Instrumentation. The data collection methods of this research comprised semi-structured open-ended interview questions. In interpretive phenomenological research,

the intent is to interpret how the phenomena is seen from the perspective of the participants and the researcher of the study (Smith et al., 2009). Additionally, in phenomenological research "deep and rich descriptions of the phenomena are usually gathered through inductive, qualitative methods such as interviews, focus group discussions, and participant observations" (Lunenburg & Irby, 2008, p. 90). For the purpose of this research, semi-structured interviews were used to obtain qualitative data. Johnson and Christensen (2014) stated that qualitative interviews are important for gleaning in-depth information about the participants' beliefs, knowledge, reasoning, motivation, and feelings about a topic. According to Patton, the semi-structured interview "allows a researcher to enter in to the inner world of another person to gain an understanding of that person's perspective" (Patton, as cited in Johnson & Christensen, 2014, p. 233).

I adopted a semi-structured, open-ended interview approach. According to Johnson and Christensen (2014), the researcher conducts the interview with a written protocol containing between seven to eight pre-established open-ended questions. Other methodologists, such as Creswell (2013) recommended an interview protocol with five to seven questions with ample space to write the interviewees' responses. Additionally, Creswell (2013) stated that "the questions are often the sub-questions in the research study, phrased in a way that the interviewees can understand" (p. 164). In interpretive phenomenological research the construction of the interview questions must be focused on the phenomena under research, which in the case of my research, were based on the incorporation of mobile devices in Spanish literature classrooms within urban secondary schools in the Costa Rica context.

Mertler (2016) described semi-structured interviews where the researcher asks several questions to the interviewee following a protocol with pre-established questions, but having the opportunity to follow up the interviewee's responses with additional questions. This aspect depends on the interaction that is taking place between the researcher and the participant (Mertler, 2016). In this sense, I designed an interview protocol with similar questions employed in the pilot study I conducted with secondary Costa Rican teachers last Fall 2017. These questions were refined according to the information obtained from the comprehensive literature review and the findings from my pilot study.

Storing data. To collect the data, I used three digital recording devices; my iPad, Samsung Galaxy 8+, and an iPhone. All of the digital devices were password protected and the information was stored safely in a password-protected digital storage system. I was the only one who had the access to the data. The collected data will be accessible only to me for three years. After, I conducted the interviews, I transcribed the data from its original Spanish and after I had transcribed it in Spanish, I translated it into English. The interviews were conducted in Spanish because this is the native language of the participants and allowed for richer data than asking them questions in English. I followed Creswell's (2013) principles to store data in qualitative research: (a) make backup copies of the information to assure not to lose it; (b) make sure to use high quality devices that are reliable and that have sufficient memory to store large amounts of information; (c) categorize the different types of information creating a list for this purpose; (d) protect the names of the participants by creating pseudonyms for each of them.

Step 9-10: Analyze Data and Interpret Data

  Interpretive phenomenological analysis. After the collection of data, the data

analysis technique I employed was Interpretive Phenomenological Analysis (IPA).

Eatough and Smith (2008) defined IPA as "the detailed examination of individual lived

experience and how individuals make sense of that experience" (p. 179). In the analysis

of data, I addressed three foundations of IPA. First, phenomenological research aimed to

obtain a description of participants' lived experiences in their own words, rather than

addressing "pre-existing theoretical preconceptions" (Smith & Osborn, 2015, p. 41).

Second, since humans are "sense-making organisms", the researcher's interpretation of

participants' information in IPA is critical to deeply understand the phenomenon under

research (Smith & Osborn, 2015, p. 41). Third, IPA examines the detailed experience of

each participant before giving general claims or conclusions (Smith & Osborn, 2015).

Johnson and Christensen (2014) added, "IPA is interested in research participants'

perspectives on their experiences and in their somewhat distinctive experiences rather

than attempting to describe their transcendental experience" (p. 447). In other words, in

IPA, the researcher is particularly interested in the unique experiences that participants

have according to the phenomenon under research.

  To analyze Costa Rican teachers' perceptions of their experiences regarding the

implementation of mobile devices in the classrooms, under the light of IPA, I focused on

the participants' specific perceptions of the experiences when using mobile devices in the

classrooms by asking them to describe the situations they have had when using mobile

devices at schools. My goal was to have the participants think deeply about their

experiences and provide a rich and detailed description of what their perceptions are

based on those experiences. During the analysis of data, I searched for the significant

statements that were particularly relevant to the phenomenon under research. For this

data analysis, I employed a spiral process model (Creswell, 2013) described in the next

section, to analyze the data and I used the IPA strategies to tailor the analysis of the

findings. Additionally, I used coding methods that aligned to the IPA analysis proposed

by Saldaña (2016). I also themed the data as described by Saldaña (2016).

Model to analyze data. Creswell (2013) stated that the qualitative data analysis is

a "spiral process" (p. 182). Creswell (2013) described the spiral process when the

researcher gets involved in the process of analysis in analytic circles rather than a fixed

linear process. For the interpretive phenomenological data analysis, I followed

Creswell's (2013) steps to conduct a qualitative analysis: (a) organize, convert, and store

the data into a technological device; (b) read the information several times to get the gist

of the information; (c) write memos or notes in the margin of the transcripts to refer to

them later in the analysis process; (d) describe, classify, and interpret the data; (e)

categorize the information into codes and themes; (f) interpret the data; (g) represent and

visualize the information. I used NVivo12 software.

First cycle coding methods. Saldaña (2016) defines the first cycle coding

methods as the initial steps the researcher undertakes to analyze the information.

Saladaña (2016) further stated that it is crucial to select the appropriate coding methods

that align with the researchers' purpose, research questions, and the nature of the study

goals. Some of the coding strategies may overlap "slightly in function", but the

researcher's criteria and understanding of the topic under research is crucial to select the

coding methods that suffice the study's purpose (Saldaña, 2016). The first cycle coding

methods comprise seven subcategories: (a) grammatical methods; (b) elemental methods; (c) affective methods; (d) literary language methods; (e) exploratory methods; (f) procedural methods; (g) theming the data (Saldaña, 2016). The coding methods I selected for the data analysis are included in the elemental methods, affective methods, and theming the data (Saldaña, 2016). These coding methods are comprised of In Vivo Coding, Emotion Coding, Values Coding, and Process Coding. These coding strategies attune with IPA analysis (Saldaña, 2016).

In vivo coding. Miles et al. (2014) described In Vivo coding as a well-known common method that honors the participants' voices. In this coding method, the researcher uses words or short phrases from the subjects' own language to transfer them in their data records. Saldaña (2016) stated that In Vivo coding is to use "terms and concepts drawn from the words of the participants themselves" (p. 106). Thus, researchers seek to obtain the essence of the participants' experiences. This coding method principle is central to IPA main purpose, which is to capture the meanings embedded in peoples' lived experiences. Hence, during In Vivo coding, I used the participants' own words to provide a clear explanation of how the participants perceived the incorporation of mobile devices in the classrooms.

Values coding. Miles et al. (2014) stated the researcher employs Values Coding to reflect on the "participant's values, attitudes, and beliefs representing his or her perspectives or worldview" (p. 75). This coding strategy is pertinent to IPA, because it seeks to explore the origin of the participants' values, beliefs, and attitudes "derived from such individuals, institutions, and phenomena as parents, peers, school, religion, media, and age cohort, as well as the participants' personal and unique experiences,

development, and self-constructed identities from social interaction and material

possession" (Saldaña, 2016, p. 135). This coding method is appropriate for the analysis

of the data I obtained about teachers' perceptions regarding mobile devices. In this case,

this coding method helped me to understand the value-laden system the participants had

toward mobile devices for the teaching practice and how they perceived the implications

of implementing these tools in the teaching and learning practice.

Process coding. Miles et al. (2014) defined process coding as "a method [that]

uses gerunds…exclusively to connote observable and conceptual action in the data" (p.

75). For instance, simple behaviors such as reading, playing, watching tv, and exercising

and other general conceptual action such as: negotiating, surviving, and adapting can be

denominated as Process Coding (Saldaña, 2016).

Emotion coding. For the IPA I employed Emotion Coding. These coding

techniques aligned with In Vivo coding in the sense that both methods seek to deeply

understand different conditions and feelings humans experience in different situations.

According to Saldaña (2016), "[emotion coding is] particularly for those that explore

intrapersonal and interpersonal participant experiences and actions, especially in matters

of social relationships, reasoning, decision-decision making, judgment, and risk taking"

(p. 125). Using this coding technique, I provided a deep understanding of participants'

insights, worldviews, and life circumstances. To this, Corbin and Straus (2015) asserted

"one can't separate emotion from action; they flow together, one leading into the other"

(p. 23).

Theming the data. Likewise, for the data analysis I employed Theming the Data

(Saldaña, 2014) after I had coded the data. Theming the data approach is exclusively

used for phenomenological research, as "theming data is perhaps more applicable to interviews and participant-generated documents and artifacts, rather than research-generated field notes alone" (Saldaña, 2014, p. 200). In this approach, I described and interpreted the participants' experiences and identified them as a unit of data gleaned from In Vivo coding, values coding, process coding, and emotion coding. Theming the data helped me to describe what the information was about or what it meant to the participants (Saldaña, 2016). In addition, in the theming approach, the researcher pinpoints repeated information and find patterns within the data. In this way, the phenomena under research is captured to provide a deep understanding of how the participants perceive their worldviews (Saldaña, 2016).

Second cycle coding methods. Once I finished the first coding cycle and themeing the data, I went to the second cycle of coding. Creswell (2013) explained that second cycle is an advanced way of reorganizing, reanalyzing data coded in the first cycle and used if the researcher needs it. Creswell (2013) further added "second cycle is to develop a sense of categorical, thematic, conceptual, and/or theoretical organization from your array of first cycle codes" (p. 234). Some examples of the second cycle coding methods are (a) pattern coding; (b) focused coding; (c) axial coding; and (d) theoretical coding (Creswell, 2013).

Role of the researcher. I was the main researcher in this interpretive phenomenological study. In interpretive phenomenological study, the researcher is part of the research. Additionally, Eatough and Smith (2008) added that during the research interviews, the participants are viewed as the experts on the phenomena under research but "finding something which challenges previous assumptions leads to the receptive

researcher to generate and develop interpretations which accommodate and bring to light the unexpected" (p. 188). Being a former educator across multiple Costa Rican educational settings, allowed me to have an understanding of the teaching practices and classroom dynamics that took place in the secondary school where I conducted the study. I brought these preconceptions and background knowledge into the research, that is what Heidegger described as being-in-the world in the interpretive phenomenological research (Giorgi & Giorgi, 2008).

Step 11: Validating/Legitimating the Data

Johnson and Christensen (2014) indicated validity is crucial in qualitative research because it makes it more plausible, trustworthy, and credible. To this regard, Creswell (2013) added that "validation" in qualitative research to be an attempt to assess the "accuracy" of the findings, as best described by the researcher and the participants" (pp. 249-250). Some criteria I employed to obtain validity in this phenomenological research were (a) saturation of data; (b) triangulation; (c) member checking; and (d) reflexivity. An array of different strategies have been evaluated and used by qualitative researchers to ensure the trustworthiness of data in qualitative inquiry (Guba 1981; Guba & Lincoln, 1982; Guest, Bunce, & Johnson, 2006); nonetheless, the researchers are the ones who gauge which validation strategies are more plausible, adept, and appropriate for their study (Creswell, 2013).

Data saturation. To validate the data in this phenomenological study, I followed Guest et al. (2006) recommendations when using non-probabilistic sample sizes such as snowballing to achieve saturation and variation in the data. In their qualitative study, Guest et al. (2006) conducted 60 in-depth semi-structured open-ended interviews of

women in two countries from West Africa. Guest et al. (2006) reached a point where no new information was detected in the interview's data after its meticulous systematization and thematic exhaustion; in this case, the researchers concluded that 12 in-depth interviews would yield data saturation and variation. Morse (1994) stated that "saturation is the key to excellent qualitative work" (p. 147); further the author added that "Saturation is the building of rich data within the process of inquiry, by attending to scope and replication; hence, in turn, building the theoretical aspects of inquiry" (Morse, 2015, p. 587).

Creswell (2014) further illustrated that in the qualitative research the researcher seeks for confirmability rather than the objectivity when establishing the value of the data. Thus, with saturation of data, I looked for "a confluence of evidence that breeds credibility, that allows us to feel confident about our observations, interpretations and conclusions" (Eisner, 1991, p. 110). Therefore, in this interpretive phenomenological research, I conducted 12 in-depth interviews to the participants and followed Guest et al. (2006) recommendations to obtain saturation and variation of data in research with non-probabilistic sample sizes for attaining trustworthiness in this study.

Triangulation. This validation approach is where the researcher uses a variety of methods, data sources, theoretical perspectives, and investigators to corroborate their findings (Creswell, 2013; Durall-Gazulla, 2012; Johnson & Christensen, 2014). Durall-Gazulla (2012) added that triangulation enhances rigor, richness, breadth, and depth in qualitative research. In the case of this interpretive phenomenological study, I used triangulation to support my conclusions and have more confidence in the findings. Some

of the methods I employed for the triangulation of the data are: interview documents, field notes, and documents obtained for the study.

Member checking. Mertler (2016) defined member checking as the "process of asking participants who were directly involved in the study to review the accuracy of the research report" (p. 212). For Lincoln and Guba (1985), this validation technique is fundamental for enhancing credibility and trustworthiness in a qualitative research study. To this, Creswell (2013) asserted that researchers should take data, assumptions, and interpretations back to the participants to check for the veracity of the information. For interpretive phenomenological research, Johnson and Christensen (2014) asserted this validation strategy is relevant to check on the essence of the participants' experiences. In this case, I had the participants review my interpretations and descriptions of their perceptions of their experiences when incorporating mobile devices in their classrooms to provide accurate assertions from the obtained data.

Reflexivity. This is a key strategy for the researcher to actively engage in critical self-reflection (Johnson & Christensen, 2014). I used this strategy to reflect on possible biases and predispositions that might interfere with the description and interpretation of the participants' perceptions of the experiences regarding the incorporation of mobile devices in the classrooms. Even though in interpretive phenomenological study the role of the researcher is being present in the study, where there is no bracketing from the phenomenon the participants are experiencing, I consider it is necessary to provide accurate and credible interpretations that reflect upon participants' voices and phenomenon under research. Therefore, as the study takes place, I constantly reflected

on information provided by the participants and my own biases to provide credible information.

Additionally, I kept a reflection journal that helped me reflect upon the dissertation process. This provided deeper insights to the data analysis. I saved the emails between my dissertation chair and myself that discussed these thoughts, as well as my debriefing conversations with my dissertation chair, and these were included in the data analysis as well. This information was part of the triangulation for the data analysis.

Limitations and Delimitations

Limitations. For Mertler (2016) limitations are aspects the researcher cannot control and that effect the study and the research's findings. Some limitations for this interpretive phenomenological research were (a) political and economic situations taking place during the data collection that might have affected teachers' self-perceptions regarding the incorporation of mobile devices in the classrooms; (b) delays in the IRB approval that prevented me to collect data as expected; this situation subsequently delayed my data analysis.

Delimitations. Delimitations is "a restriction placed on the study by the researcher to limit its scope (Mertler, 2016, p. 186). A delimitation for the study is to choose Spanish secondary Costa Ricans teachers from an urban area located in the northern Pacific Coast of Costa Rica. Spanish teachers were selected to focus the population of the study. Additionally, the location was selected because of the accessibility and the large population of teachers that worked in this institution. This made access to the population more feasible.

Summary

In this chapter, I described in detail the methodology I employed to conduct the study about select Costa Rican Spanish teachers' perceptions of the experiences when incorporating mobile devices in the classrooms. First, I explained sampling population. Then, I described the various types of phenomenology studies, the interpretive phenomenological approach, and why I selected this particular phenomenological approach. I provided a detailed description of the data collection that included the procedures, the interview process, and storing the data. Additionally, I explained the way the information was analyzed and how I validated the data. I described several validating techniques such as: saturation of data, triangulation, member checking, and reflexivity. Finally, I stated the limitations and delimitations of the study. Next, I discuss the methodological procedures in context.

CHAPTER IV

Methodological Procedures in Context

Chapter Overview

In the previous chapter, I described the methodology that I implemented during my research. In Chapter IV, I describe the collection of the data, including the access and constraints that I encountered during the collection of the data. Gerber (2019) calls for the use of methodological procedures in context chapters (e.g., Gerber, 2008; Gound, 2020; Niemeyer, 2016; Stanford, 2020; Stufft, 2016) in dissertation work because, "these chapters allow for readers to gain a detailed understanding about how the data collection process might have diverged from the originally intended plan; particularly, in qualitative research, methodological procedures in context provide an element of transparency about the data collection process and provide a detailed road map for other doctoral students and scholars looking to conduct similar research (np)." As Gerber (2019) stresses, methodological procedures in context chapters should include detailed information about (a) gaining access; (b) establishing rapport; (c) impression management; (d) role management; (e) informed consent; (f) deception, if occurring; (g) researcher/research participant relationships; (h) conflicting obligations, if any occurred; (g) making the private public; and (h) disengaging from the field.

Gaining Access and Establishing Rapport

First contact with the Costa Rican's high school's principal. To gain permission to interview 12 secondary Spanish teachers from an urban educational setting located in the northwestern part of the Pacific Coast of Costa Rica, I contacted the Luna Blanca High School (pseudonym) principal by telephone. I chose to conduct the research

at Luna Blanca High School because of its large teacher population, which was convenient to recruiting at least 12 participants with a purposive snowball sampling plan. At the beginning of the process, the purpose of the research was to conduct interviews with Spanish teachers to have both a selected and focused group of teachers, as well as to further explore the implications from my teen book circle project, which involved exploring the implications around students in book clubs. However, this situation changed when I realized that Luna Blanca High School had only half of the population I needed to interview.

To begin the process, I called Luna Blanca High School on October 10th, 2018, to talk to the principal, Estella Vargas (pseudonym) to begin the process of getting permission from her to conduct my study at her school; however, I could not reach her at this time because she was in a meeting. I left a message with the secretary of the institution telling her I would call again the next day. I called the Estella again the next day, but she was not available at that time. Therefore, I left another message with the secretary. I chose not to leave my phone number with the secretary because calling my phone number would incur international phone charges. If the principal called me, she would have not had the chance to reach my phone number. Instead, I chose to just call back two weeks later, because during the month of October secondary students are preparing to take Bachillerato test. This is a busy time of the year for secondary schools, since administrators have to prepare paperwork. Therefore, I decided to wait until the end of the month to contact the principal again.

Two weeks after my initial attempt to make contact, I called Luna Blanca High School again and I was able to talk to the principal, Estella Vargas. I briefly introduced

myself and explained the purpose of my research. I explained why I chose to conduct my research at Luna Blanca High School. I perceived the principal was kind and open to talk with me by her tone of voice. Therefore, I felt that perhaps the teachers would be willing and open to share their perceptions, given the interest the principal stated while talking to her on the phone. Estella Vargas seemed enthusiastic about the research that I planned to conduct and asked me several questions about the procedures.

After I explained in detail the purpose of investigation, she agreed that I could conduct my study at Luna Blanca High School. At this point, in order to meet the requirements of my university Institutional Review Board, which requires a letter of support from the research site to be included with the protocol application, I asked Estella Vargas to write a letter in Spanish and in English that would give me permission to conduct the research with her secondary teachers (See Appendix A). I then included the letters as part of my IRB protocol application in order to get permission from the Institutional Review Board (IRB) of Sam Houston State University to conduct my study.

Institutional review board process. On February 8th, 2019, after I successfully defended my dissertation proposal, I started the IRB protocol process to get permission to conduct the research at Luna Blanca High School. In the IRB protocol, I explained in detail the purpose of my study, the methodology, and the data collection methods I would employ for my research. To begin the process, I asked for guidance from my dissertation chair to initiate the digital form in the IRB Cayuse platform. Thus, my dissertation chair, Dr. Hannah R. Gerber, met with me and provided guidance in writing the protocol, including offering me suggested revisions to first and second drafts of my IRB before I submitted the IRB protocol for review from the IRB.

As part of the IRB requirements, I wrote letters of informed consent in both English and Spanish (See Appendices B, C, D, E). This was a necessary process, because the teachers I planned to interview for my study were not native English speakers. In order to verify that the letters were contextually relevant, I asked a certified bilingual professor from Costa Rica to read the letters to ensure the content of the translations was correct. Once the letters were proofread and verified, I included them with my IRB protocol documents.

Originally, I planned to collect data during 2019 Spring Break; which fell during the dates of 11th to 17th of March, 2019. I submitted my IRB protocol on February 28th 2019, hoping that it would pass through quickly because my chair and I had carefully reviewed everything and verified and double checked to ensure that the information was clear and consistent. Additionally, my IRB protocol qualified for expedited review since it was dealing with a non-vulnerable adult population and did not involve deception and was of minimal risk. This meant it would not have to be reviewed by the full IRB board at a convened meeting but rather route through the university compliance officer and one IRB member for review. Unfortunately, the individual who was department chair at the time rejected my IRB application on March 18th, 2019, three weeks after I submitted the original document, because all references were not listed, some areas of the document contained bold-faced text, she noted potential differences in the amount of time I should invest in the interviews, and the phone interviews were not checked (former chair, personal communication, March 18th, 2019).

I emailed Sharla Miles, the university compliance officer, for clarification on this rejection and she said that the department chair had returned it for revisions and it could

not begin the routing process until the department chair approved it. Under the direction of my dissertation chair, I made these modifications as requested by the department chair and resubmitted them to the IRB Cayuse system on March 19th, 2019. The department chair then approved my protocol on March 23rd, 2019, and it was then routed to the IRB for the beginning of the review. Unfortunately, this situation delayed the data collection process by one month, and I could not collect data during my originally planned window of Spring Break. On April 8th, 2019, the IRB office notified me that my IRB protocol was approved to conduct my research at Luna Blanca High School.

Once I had permission to conduct my study, I contacted the principal by phone to tell her I was approved for conducting the study in the secondary institution. In the same phone conversation, I gave her my tentative dates of April 19th to 30th, to visit the institution to begin recruiting participants through a purposive snowball sampling. As the call ended, I told the principal that once I arrived in Costa Rica, I would communicate with her via phone in order to meet with her to provide the necessary approval documentation before I began the study. The principal provided me with her personal contact information including her cellphone and email. From that point forward, we planned to communicate only via telephone and WhatsApp as part of my data security plan, since email is not secure method of communication unless it is end-to-end encrypted email.

Luna Blanca High School demographics. When I arrived at Luna Blanca High School on April 22nd, 2019, I noticed that the building needed maintenance attention such as painting, secured classrooms' doors, and windows. The classrooms' doors did not have locks; which meant anyone could break into the classroom. Some other doors

were constructed of metal bars, and to lock the door there was a chain that was wrapped in one of the holes of the door, with the hole of the window that was next to the door. Some of the windows did not have glass and they did not even have a frame to put the glass. On some of the Luna Blanca High School's walls, there were some graffiti marks, especially near the bathrooms. The paint of some other walls seemed faded and worn off. Nonetheless, this institution is big and the green areas around the classrooms looked well maintained and beautiful.

This high school is well known around the area, and has enrollment of 1300 students from different parts of the city, who are mostly from low socioeconomic settings. The daily bell schedule is from 7:00 a.m. to 4:10 p.m. This academic high school has 7th, 8th, 9th, 10th, and 11th grades There are 47 classrooms, 95 teachers, and 15 administrative personal. The subjects taught at Luna Blanca High School include (a) Mathematics; (b) Spanish; (c) Social Studies; (d) Civics; (e) Science; (f) Physical Education; (g) Religion; (h) Arts; (i) Music; (j) Chemistry; (k) Physics; (l) Agriculture; (m) Biology; (n) Philosophy; (o) English; (p) Psychology; (q) French; (r) Conversational English; (s) Tourism; and (t) Informatics; all of which are standard for the Costa Rican curriculum.

Data collection process. I traveled to Costa Rica on April 20th, 2019 to collect data. On the same day, I arrived to Costa Rica, I prepared all of the consent forms for the study and put them into the folders to give to each of the participants. I made sure I had my three audio-recording devices and checked if they were working correctly and charged. The devices that I prepared were my iPad, iPhone, and Samsung Galaxy 8s+. Then, I sent a message to the Estella Vargas through WhatsApp asking her if I could

meet with her on Monday, April 22nd, 2019. The principal said there was no problem and she said she could meet at 9 a.m. on April 22nd, 2019.

On the week of April 22nd, I visited Luna Blanca High School. I arrived earlier than 9:00 a.m., to make sure I had plenty of time to be familiarized with the institution. To get into the high school, the guard asked for my name and the reason of the visit to the institution. I told him I had already set up an appointment to talk with the principal. I felt confident I was going to have a good conversation with the principal, since every time I talked to her on the phone she seemed receptive to have me in the institution. I was somewhat apprehensive because of the responsibility of conducting interviews with teachers I did not know. I hoped the process of recruiting the participants would not have any problems and that the participants would be receptive to the interviews.

To my surprise, I did not see any high school students, and the building seemed empty. Usually, since Luna Blanca High School is a fairly large institution and I used to pass by that institution every day to go to work to Star School (pseudonym), there were always students outside of the classrooms receiving Physical Education or walking during recess. I thought teachers were on a strike again when I saw little activity there. Thus, I went to the guard and asked if the teachers were on a strike, but he mentioned that only 11th grade students from different institutions of the region were attending school to take a Bachillerato makeup test. The rest of the students were not in the institution.

Bachillerato is a Costa Rican national standardized test that students must pass to enter public universities of Costa Rica. If the students do not pass this test at first, they have a second opportunity to take it. Different teachers from other institutions were supervising these tests. Make-up tests were taking place in Luna Blanca High School

during that week, because of the convenient access to of the institution and the size of the building. Thus, teachers from Luna Blanca High School were not teaching that day, but instead had to remain in the institution completing administrative duties, which facilitated the recruitment of the participants.

Next, I looked for the principal's office. Once at Estella's office, I was introduced to the secretary and I told her that I had a meeting with the principal. The secretary told me that Estella was expecting my visit, but she was in a different meeting at that moment. The secretary told me I could wait for her in the office. Finally, at 9:20 a.m. I met with the Estella in her office. She seemed a happy and a pleasant person with a very calm and friendly personality. This helped to create rapport; I could see she was receptive and willing to help me. I introduced myself formally and I shared more about my teaching background. She was surprised and happy that a teacher from this region of Costa Rica was studying abroad for a doctorate, since there is often a limited opportunity for Costa Rican teachers to study abroad to earn doctorates.

The principal kept asking me more details about my research and Sam Houston State University. Even though I previously provided detailed information about the recruitment process and how I was going to meet with the participants, I explained the protocol I had to follow again. The principal told me she would grant permission for the teachers to be interviewed while at the high school if they wanted to, but I told her I needed to protect their privacy, since they were going to provide information about their perceptions about their experiences using mobile devices in the classrooms. She said that in the institution there is a private room that meets the required conditions for conducting interviews after the high school students took the make-up tests. The principal told me

that only six Spanish teachers worked for Luna Blanca High School. I decided to keep recruiting participants, although they were not teaching Spanish. Thus, Estella gave me permission to go to one of the Spanish teachers' classrooms to start with the recruiting process.

I explained what happened to Dr. Hannah R. Gerber, my dissertation chair, about what I found out about there were only six Spanish teachers at Luna Blanca High School. Dr. Gerber told me I could do an amendment to include the six participants who were not Spanish teachers to the IRB. She strongly recommended that the participants had to comply with the following recruitment criteria: (a) participants who have been teaching for more than 5 years; (b) participants who have been implementing mobile learning teaching practices, so that I would have a homogenous sampling, which was what we had indicated in my IRB protocol for recruitment. Dr. Gerber said I could use the other interviews for the data analysis if the IRB approved an amendment to the protocol. In all, this allowed me to recruit 12 teachers from different subjects.

On May 30th, 2019 I sent an email to Ms. Sharla Miles, M.Ed., the Research Compliance Administrator at Sam Houston State University, and asked how to complete the amendment for the IRB, to include participants that were not from Spanish subject. Ms. Miles advised me to add a modification to add the additional population to the study. She instructed me to delete the name "Spanish" in every section of the IRB protocol where the amendment was needed. Thus, I revised the IRB protocol and made the appropriate corrections to the document. On August 1st, 2019, the modification was approved by IRB office. After this approval, I could begin to transcribe and translate the

other six interviews collected from the other teachers who taught different subjects other than Spanish literature.

Recruitment of participants and informed consent. On April 22nd, 2019, I had the initial contact with the first participant. Estella granted me permission to go to one of the Spanish literature teacher's classrooms to give the folder with the information about the study and the recruitment of participants. Thus, I looked for the teacher's class and I found Rosa (pseudonym). When I went to look for Rosa, she was working on her lesson planning. She is a short and slim teacher and was wearing a pink blouse with blue jeans. The classroom where Rosa was seemed organized. It was cleaned, but there were not many books or resources in the classrooms. There was only a whiteboard, a desk, and the students' chairs. I do not recall any books or other didactic material inside of the classroom.

Rosa was in her mid-forties. She seemed surprised that I wanted to talk with her. I introduced myself and explained the purpose of my visit to the high school. I told Rosa I wanted to better understand teachers' perceptions regarding the use of mobile devices in their classrooms. I also explained that I was interested in mobile learning and the impact this has on education. Rosa read the document entirely and she stated that she was willing to help me with the interview process. I told Rosa the principal granted permission for interviews during the school day, and that there was an available room that was private for conducting the interviews.

Rosa agreed to be interviewed at the private room on Thursday, April 25th at 10:40 a.m. I noted the date on my calendar when I would interview her with a pseudonym that she chose. I also gave Rosa the option to be interviewed through Zoom

video-conferencing platform that encrypts the information and record video calls, because this too was a method that I had approved by the IRB. Rosa preferred to be interviewed face-to-face. Because I was using snowball sampling, I asked Rosa if she knew any other teachers who met the same criteria for the interview. She said she knew two teachers who met the criteria and who might be willing to be interviewed. Rosa gave me the name of two teachers, Hermosa (pseudonyms) – one other individual who declined to be interviewed. Rosa provided me the classrooms' numbers where the two potential participants were located. Perla declined to be interviewed.

Due to issues with breach of confidentiality that will be explained later, Hermosa's information was deleted; however, when I approached Hermosa, she provided the name of Peregrino Gris (Pseudonym). Another secondary teacher whose information was taken out from the study due to issues with breach of confidentiality was Altamira. However, Altamira provided two participants names: Sol-Naciente and Profe-Moreno (pseudonyms).

I then went by Peregrino-Gris' room; however, he was not at the high school that day because he had a medical appointment. Thus, I went to the principal's office and asked her when he was going to be at school. Estella said he would be back the next day; she also gave me his phone number, so I could contact him. However, I decided to wait until next day to meet Peregrino Gris at the high school and ask him if he would be willing to participate in the investigation versus calling him on his phone since he did not know who I was.

Since Peregrino-Gris was absent on this day, I then looked for Sol-Naciente's classroom. When I went to Sol-Naciente's classroom, she was working on school's

documents. The classroom seemed well organized and I could see some posters around the class. The classroom's walls seemed recently painted and there were different ornaments like plants. When Sol-Naciente saw me, she immediately recognized me, since she was one of my former high school teachers. This was also a nice surprise for both of us. Sol-Naciente is fairly short teacher. She has a slim physique and long curly hair. Sol-Naciente is a very enthusiastic and loving teacher. I can say she was happy to see me, since she was smiling from the moment I saw her until I left the classroom. That was comforting. Based on my experience as a high school student, Sol-Naciente was one of the best teachers of social studies I have ever had. She was committed to her students' successful academic performance; she constantly looked for ways to improve and innovate in her Social Studies classes. I enjoyed her classes and I learned greatly about world's history.

After an initial brief visit, I explained the purpose of my study. She seemed very happy and proud I was conducting a study in that secondary institution. Thus, I gave Sol-Naciente the folder with the information prepared for the interviews, and she immediately agreed participate in the study. I told Sol-Naciente the guidelines of the study and asked her when she wanted to be interviewed. Sol-Naciente said she wanted to have a face-to-face interview on April 29th at 7:00 a.m. I told her I could not interview her at the institution if there were students around, so she decided to have the interview on Saturday, April 27th at 11:00 a.m. I did not have any problem with that and I asked her if she knew other teachers that could be possible participants for the interview. Sol-Naciente gave me the name of Primorosa (pseudonym), and she told me Primorosa's

classroom was in the same hallway, so I could ask her if she wanted to participate in the interview. I thanked Sol-Naciente and I went to look for Profe-Moreno.

Profe Moreno's classroom was right next to Sol-Naciente. I asked Profe Moreno if he had a moment to talk, and he agreed. I gave him the information and explained the purpose of my visit to Luna Blanca High School. Profe-Moreno is in his early 40's. He seemed a receptive and kind person. He is a fairly short and slim teacher. His classrooms seemed well equipped with different materials and resources that he had in two bookshelves. The classroom did not have a good lighting either, but this was deliberate, since Profe Moreno said he uses the overhead projector to teach his classes. This was the first time I noticed a teacher had an head projector in the class.

When Profe-Moreno understood the reason of my visit, he said he had experience with technological teaching practices. He worked in a technological high school, where they used different digital devices for seven years before working in Luna Blanca High School. Thus, he seemed eager to share his experience for my study. I followed the same protocol as with the other participants, and Profe-Moreno said he did not have any problem with an interview on Thursday, April 25th, at 10:00 a.m. at Luna Blanca High School. I asked Profe Moreno if he knew another teacher who would be willing to be interviewed and who complied with the recruitment criteria. I asked Profe-Moreno is he knew other potential participants' names and he mentioned Hermosa and Altamira. Unfortunately, I accidentally and inadvertently told him that they had already agreed to be in the study, which is considered a breach of confidentiality, so therefore, I had to file this as an incident report and the IRB required that I destroy the interviews and all

transcripts and data related to those participants. I did ask him for some other names and he did not provide any other names.

I went to look for Primorosa's classroom. Primorosa was talking with other two teachers, so I did not want to interrupt, but she said there was no problem and we could talk for a few minutes and she stepped away from the others so we could talk privately outside of her classroom. I briefly introduced myself and explained the purpose of my dissertation. Primorosa seemed like a quiet and serious teacher, and she started to ask me more questions in detail. She is likely in her 40's. Primorosa is a tall and thin teacher. She looked skeptical about the study and I had to provide her information about whom I was and why I was conducting the study.

Then, I provided the IRB consent form for her to see the procedures of the study. Primorosa was hesitant about being interviewed; I told her if she did not want to be interviewed there was no problem and if she changed her mind she could always contact me. Hence, I asked her if she knew other teacher who would be willing to participate in the research and whom she thought used any digital devices in their classrooms, and she gave me the name of Minnie and Rosa Blanca (pseudonyms), the two teachers who were in the classroom with her. Primorosa invited me to go inside the classroom and I asked the teachers if they were willing to participate.

Each teacher stepped into a private space with me when I asked them to so we could speak. The first teacher I asked was Rosa-Blanca. Rosa-Blanca is a Social Studies teacher who is in her early 40's. She is short with a curvy body physique. She had a calm and reserved demeanor; however, she was interested in knowing more about the research. I provided Rosa-Blanca the information from IRB. She scanned the documents

and she immediately agreed to be interviewed. I thanked her and I asked her when she would be available. I asked the same questions I asked the other participants I recruited. Rosa-Blanca said she could have the interview on Thursday, April 25th at 1:00 p.m. at school.

Then, I approached Minnie. Minnie is a teacher who is a Social Studies teacher who is in her early 30's. She is a short and curvy teacher. Minnie looked calm and suspicious about the study I was going to conduct. At that time, based on Minnie's demeanor, I thought she would not be willing to participate in the study. I told her that participation in the study was voluntarily and she could decide to participate or not. I provided Minnie the information and she read it fast. She said she would tell me later. I told Minnie that all of my personal contact information was there and that she could send me a message agreeing or not to participate in the study.

Next, I went to the principal's office. While at the principal's office, Estella introduced to me Soñadora, who is an English foreign language teacher. To protect Soñadora's confidentiality, I invited Soñadora to talk with me outside of the principal's office. Once we were in a comfortable and secure environment, I introduced myself to her and started explaining the purpose of my visit. I also shared about my teaching and educational background. Since both of us are English foreign language teachers, Soñadora and I established good rapport. She was interested in the experience I was having as a doctoral student at SHSU. She said she would like to have this opportunity, since for English language teachers from Costa Rica, the opportunity to purse a doctoral degree in a different country is limited. During the conversation with Soñadora, we were sharing our desires about education; after this conversation she chose the pseudonym

Soñadora, which means dreamer in English. I could see she has very good intentions and many goals she would like to accomplish to improve education. Soñadora is in her 30's. She also seemed friendly and sweet. Soñadora was about my height (5'4") with a pleasant personality. She has an outward appearance of a demeanor that seems as if it will create a comfortable environment. Soñadora actually asked me if she could be interviewed versus me asking her to be interviewed; it seemed she was willing to share her experiences. I said, "Of course!" Thus, I gave Soñadora the folder with the information. Then, I asked her if she knew more teachers whom she thought could be potential participants for the study, and she suggested Herediana (pseudonym). I then asked Soñadora when she could be interviewed and she told me on Monday, April 29th at 3:00 p.m. after she leaves work, at a cafeteria close to Luna Blanca High School. I went back to the principal's office and I asked Estella for the location of Herediana's classroom.

The principal took me to the library, where Herediana usually does her lesson planning; once we got to the library, Estella immediately left. As I walked inside of the library, I could see several books in bookshelves around the walls of the room. The library was medium size and equipped with some technological tools teachers can use to teach in their classes, e.g., head projectors and speakers. The library has air-conditioning and Internet the students can use to read with ten iPads the library has. The room also has a big screen, where teachers and students can watch videos or movies related to the content of the class.

I saw a teacher writing on some papers on the table of the library. I approached her and I asked her if she was Herediana. She said, "Yes". Then, I introduced myself to

Herediana. She seemed a friendly person. Herediana was always smiling and receptive to me. She looked to be in her mid-30's. She is thin and tall, with short black hair. She was a very enthusiastic teacher who was curious about why I was looking for her.

I explained the purpose of my visit to the school and gave her the folder with the consent forms. Herediana seemed receptive to the interview and she told me she used to work in a rural school with the ABC Mouse Program, where the students worked with tablets provided by an organization that helped the community. Herediana was willing to share her experience to help with my dissertation. I followed the same protocol with Herediana, providing the guidelines that I used the other teachers which were (a) decide whether or not be interviewed; (b) not accepting being interview would not bring any harm; (c) deciding on the place and modal preference before the interview; and (d) provide the name of a potential participant based on the recruitment criteria. Heredina agreed to be interviewed at the high school on Wednesday, April 24th, at 1:00 p.m. After Herediana agreed to be interviewed, I asked her if she knew another teacher who might meet the inclusion criteria and she mentioned Nicoyana (pseudonym), who also was in the same room.

Nicoyana was in the library when I was talking with Herediana. I approached Nicoyana and introduced myself. I explained the purpose of my visit and she said she would be willing to help me with my dissertation. I provided the consent forms, so she could read the information in advance. Nicoyana is a Spanish teacher who is in her 40's. Her body or physique was short and curvy. She presented herself as nice and attentive person; she seemed curious about the study. She told me she liked this topic, because she had experience working with mobile devices in the classrooms through Movilab.

Movilab is an initiative of Ministry of Education of Costa Rica and Fundación Omar Dengo (MEP-FOD), where they provide laptops to Mathematic and Spanish teachers from rural secondary high schools to use with their students implementing mobile learning practices (FOD, 2013). Thus, Nicoyana said she had time to be interviewed on Thursday, April 26th, at 12:00 p.m.

So far, I had recruited nine participants who agreed to be interviewed and I decided to finish the recruitment process for that day. I created a schedule, where I could write the dates, times, and places where the teachers were going to be interviewed. I was still waiting for Primorosa's and Minnie's responses to be interviewed. I also told the principal I would come back the next day to continue recruiting participants.

On April 23rd I returned to school around 10:00 a.m., and I looked for Peregrino-Gris. I found Peregrino-Gris in the principal's office. When I got a chance, I asked to speak with him outside of the principal's office. I explained to him the purpose of the research and provided the documents. He immediately agreed to be interviewed on Friday, April 26th, at 1:00 p.m. Peregrino is a Spanish teacher who is in his mid-40's. He is a tall and slim teacher, who seemed serious and respectful, but he was open to talk with me. He was interested in sharing his experiences about the topic under research. Then I looked for Minnie. Minnie was in her classroom and she agreed to be interviewed. I provided the documents for her to be familiarized with the research. Finally, I looked for Primorosa's classroom. Primorosa was working on paperwork and she agreed to be interviewed. Minnie agreed to be interviewed on Wednesday, April 24th, 2019 at 11:00 a.m. and Primorosa on Saturday, April 27th, at 10:00 a.m.

I believe the recruitment process went smoothly, without major complications. The majority of teachers seemed willing to be interviewed for the study. Despite the challenges with the IRB being delayed with the former department chair, I think the timing for recruiting the teachers was conducive for collecting data. At the time I began recruitment, the high school teachers were not engaged in direct instruction, but rather were working on administrative duties. This gave me the flexibility to contact them while they were all in the same place through the purposive snowball sampling. Additionally, another aspect I think was conducive to recruiting participants was that I used to be a teacher from their community.

They did not see me as a stranger or an outsider. Although we had different commonalities, especially in culture and teaching experience, I think that was a favorable factor that allowed me to create rapport with the teachers. A noteworthy factor is that other teachers who were aware I was conducting research were interested in participating in the interview process. However, after 12 teachers agreed to be part of the study, I stopped with the 12 participants at that moment. I left Luna Blanca High School around 3:00 p.m. on April 22nd, 2019, and I then created the tables with the numbers of the participants.

Table 3

Secondary High School Teachers Interview Schedule

Secondary Teachers Pseudonyms	April 24th	April 25th	April 26th	April 27th	April 29th
1. Herediana	1:00 p.m.				
2. Minnie	11:00 a.m.				
3. Nicoyana			1:00 p.m.		
4. Peregrino Gris			12:00 p.m.		
5. Primorosa				10: 00 a.m.	
6. Profe Moreno		10: 00 a.m.			
7. Rosa	10: 00 a.m.				
8. Rosa Blanca		1:00 p.m.			
9. Sol Naciente				1: 00 a.m.	
10. Soñadora					3:00 p.m.

Interview Process and Participants

First day of interviews. On April 24th, 2019, I started the interview process according to the schedule chart that the I filled out with the dates they were available to be interviewed. The first participant was Rosa, whose interview was at 10:00 a.m. in the private room assigned by the principal. I looked for Rosa and we both went to the room. I previously asked one of the janitors to open the room for us and I set up all of the necessary audio recording devices to start with the interview process. Rosa is a Spanish teacher who has been working for the Ministry of Education during her 23 years as an educator. She is 46 years old and is originally from the town where Luna Blanca High School is located. Currently, Rosa is teaching 10th level and she has five different groups.

I started the interview by providing Rosa the IRB informed consent form. Rosa read the information more carefully and I asked her if she had any questions before I started the interview. She stated that everything was clear on the forms and she signed the documents. We agreed that I would send the transcripts of the interview through the participant's WhatsApp, so she could corroborate that the information she provided during the interview was consistent with her responses. I gave Rosa the questions of the interview in advance, so she could be familiar with them. I asked one more time if she agreed to being audio recorded and she agreed. I had prepared three password protected digital recording devices: my iPad, an iPhone, and a Samsung Galaxy S8+. I made sure the digital recording devices were completely charged and on airplane mode to not interrupt the flow of the conversation.

During the beginning of the interview, Rosa seemed shy. She stated that this was her first time a doctoral student interviewed her. I asked Rosa the first question about the concept of mobile learning and she seemed a little hesitant to respond. Then, I continue probing, asking her more questions about technological devices and making the connection with mobile learning and mobile devices. Later, she explained what she thought mobile learning was. She asked me if what she said was fine and I told her the information she provided me was fine since this about was her own understanding. She continued talking about the experiences she had with mobile devices in the classroom; however, she expressed that she was not a fan of using cell phones in the classroom. Rosa continued sharing her experiences with the students using mobile devices for reading and doing activities during Spanish lessons. She even stated that she felt ashamed that she did not have sufficient knowledge about how to use mobile devices.

The time was passing by fast and it was almost one hour since we started the conversation. Rosa did not want to stop sharing about her experiences and what she thought about technology in general. She seemed very enthusiastic when she shared the activities she did with the students in the classroom. I could see her demeanor changed when she talked about technology and cell phones. She seemed hesitant and apprehensive. The duration of Rosa's interview was 51 minutes.

The next participant according to the schedule was Minnie. Minnie arrived to the room where I was waiting for her. She arrived on time. Minnie is 33 years old and has been working as a Social Studies teacher for 10 years. She is currently teaching 9th and 10th levels in the high school. I provided Minnie with the informed consent documents, which she read and then signed them. She kept a copy of the documents for her own records. At the beginning of the interview, Minnie shared that she was skeptical about the scope and benefits that this research could bring to her teaching practice and the high school. Minnie mentioned that she has helped researchers before and that the information has been archived without any further follow-up.

After this, I told Minnie that I would hope this research could provide valuable information that can enable stakeholders to address different situations instructors experience during their teaching. As we finished with the interview, I told Minnie that she was going to receive the transcripts via WhatsApp to corroborate the information she provided during the conversation. Minnie provided the WhatsApp, where I could send the transcribed conversation.

During Minnie's interview, I noticed that Minnie was skeptical about sharing her experiences about the use of mobile devices in the classrooms. I probed and tried to ask

information, but her answers were short and straight to the point. Minnie seemed receptive to the use of technology in the classrooms, but she was pointing out the lack of outlets they have in the classrooms. In the classroom where she works, there is only one outlet that works and that is the only one she uses either to plug in her computer or the fan. At some points of the conversation, Minnie seemed a hesitant to answer the questions, and I told her she had the right to stop the interview whenever she felt it was convenient. She continued with the interview until the last question, but her answers were short and specific. I decided it was time to finish the interview. I thanked Minnie for her valuable time and we stopped the interview. The duration of the interview with Minnie was 40 minutes.

Then, at 1:00 p.m., I interviewed Herediana. She went to the room where I was waiting for her. Herediana is an English teacher who is 38 years old. She is from the central valley of Costa Rica and has been teaching for over 10 years. She is currently teaching all the 10th levels at Luna Blanca High School. I followed the same protocol as I did in the previous two interviews. I gave Herediana the consent forms; she read them thoroughly. Once she finished reading them, I asked Herediana if she had any other questions and she did not. Then she signed the consent forms and kept one copy. I explained to Herediana that she was going to receive the transcriptions to corroborate that the information she provided was correct. Herediana agreed and gave me her WhatsApp. Herediana's interview went smoothly. I provided the interview protocol and she read the questions. I asked her if she had any questions about the interview protocol, and she said that she did not. I started asking the questions, but she provided very specific and short answers.

I probed asking more questions about the activities she did in detail with the use of mobile devices in the classrooms, but Herediana described the activities in a very specific way. However, when I asked about the teaching practices she has used in the classroom with mobile devices, Herediana mentioned that one of the aspects she liked about working in the northern Pacific Coast of Costa Rica is the monkeys "congos" she sees in the trees next to the classrooms. I was a little surprised she mentioned this in the interview; thus, I let her talk about this experience. Herediana mentioned that for students of this region it is normal to see the monkeys walking on the trees, but for Herediana this is fascinating, since she is from the Central Valley of Costa Rica. We laughed about it. I also shared that I used to see monkeys and alligators when I was teaching, since the school where I worked was next to one of the biggest rivers of the region. Talking about our teaching experiences made the conversation more amicable. Eventually, she opened up and continued sharing her experiences and insights about the use of mobile devices and technology in the classroom. In the end, we had a very successful interview. Herediana's interview was 43 minutes.

Once I finished all the interviews for that day, I downloaded the audio files on my computer and ensured that each one was password protected. I stored each interview data file in a second secure file with a de-identifiable name. Because this is a personal computer, I am the only one who had access to it. Then, I created a chart with the first three participants' information, which I filled out once I finished all of the interviews.

As a noteworthy aspect to mention is that teachers preferred to receive the documents through WhatsApp rather than Zoom platform, as established in the IRB protocol. WhatsApp platform is an end-to-end encrypted online platform. The secondary

teachers of Luna Blanca High School are more familiarized with WhatsApp platform rather than Zoom. They stated that it was more convenient for them to use WhatsApp than Zoom. Even though my pilot study had used Zoom, the participants in this region and at this school were more comfortable with WhatsApp. Therefore, I made the decision to use WhatsApp the preferable mean of communication with the participants, since they felt more comfortable using this online platform. I told about this incident to my dissertation chair on November 21st, 2019, and we followed the procedures to solve the incident report for the IRB so that the use of WhatsApp platform could be covered under my IRB protocol.

Table 4

Secondary High School Teachers Information

Secondary Teachers Pseudonyms	Age	Years of Experience	Subject	Level
1. Herediana	38	10	English	10th
2. Minnie	33	10	Social Studies	9th and 10th
3. Nicoyana	40	10	Spanish	7th, 8th and 9th
4. Peregrino Gris	47	23	Spanish	7th
5. Primorosa	40	19	Social Studies	9th, 10th, 11th
6. Profe Moreno	40	17	Social Studies	7th
7. Rosa	46	23	Spanish	10th
8. Rosa Blanca	39	21	Social Studies	8th
9. Sol Naciente	45	26	Social Studies	11th
10. Soñadora	33	12	English	10th and 11th

Second day of interviews. On April 25th, 2019, I started the second day of interviews and I began the day with Profe-Moreno. I arrived early and I made sure the room was organized and set up to have the interview. I went to for Profe-Moreno's classroom and we both went to the room assigned for the interview. Profe-Moreno is 40 years old and has been teaching Social Studies for over 17 years. This is his third year teaching at this high school and he is currently teaching 7th graders. Profe-Moreno was previously teaching at a technological high school, where he used different digital devices and modern technological practices to teach his lessons. I prepared all of my digital recording devices and the correct informed consent documentation to provide to Profe-Moreno to start the interview process.

He seemed interested in sharing information about the technological practices in the classroom since this was relevant for him. I provided Profe-Moreno the consent forms that he read carefully. He asked questions about the scope of the research findings for Costa Rican's educational curricula. I answered the same response I had for Minnie; I hoped the findings of the investigation could be valuable for informing stakeholders about what teachers experience when using digital devices in their practices. Profe-Moreno signed the consent forms and kept one for his own records. Finally, I told Profe-Moreno that he would receive the transcriptions to corroborate the information through the WhatsApp number that he provided.

Profe-Moreno's interview was highly interesting. He seemed eager to share all of the information and experiences he has had with the use of technology. Profe-Moreno started giving me thorough descriptions of what he did in the classrooms with his students. When he was providing the information, he was willing to show me all of the

technological devices he had in his classroom after we finished the interview. However, right at that moment he did not have them all since he was not teaching during the week and he was not confident to leave the devices in his classroom. During the interview Profe-Moreno's demeanor showed excitement and interest, since this was an interesting topic for him. I told Profe-Moreno that if I knew any training about technology, I would tell him. He was interested in knowing how teachers in the U.S.A incorporate teaching practices in the classroom. I shared with him some of my experience and observations from different school settings of Texas. This conversation was not recorded in the interview, since this was personal information about my teaching experience in the U.S.A.

I promised Profe Moreno I would be in touch with teachers is his high school to share more ideas and uses of mobile devices in the classroom. Profe-Moreno was grateful and he hoped we could continue communicating more and sharing information about technological tools to teach in the classroom. The interview was 51 minutes.

Rosa Blanca was the next participant to be interviewed at 1:00 p.m. I was expecting Rosa-Blanca at 1:00 p.m. and she arrived on time. Rosa Blanca is a Social Studies teacher who is 39 years old. She has been teaching social studies for 21 years and she is currently teaching to 8th graders. I followed the same protocol previously described with the participants to conduct the interviews. I provided Rosa Blanca the consent forms; she read them entirely and signed the documents. She kept the consent form for her records. I told Rosa Blanca she would receive the interview transcriptions via WhatsApp.

Rosa Blanca seemed open during the interview process. I could definitely see Rosa-Blanca wanted to share her experiences in the classroom using mobile devices. I gave Rosa-Blanca the interview protocol, she read the questions and she told me when she was ready to start the interview. I asked Rosa-Blanca what she understood about mobile learning and mobile devices in the classroom. She was a little hesitant to answer the question, but later she felt more comfortable to answer the questions. In fact, she seemed eager to share her experiences she had in a different country , when she traveled with two other students. She made a comparison between those two educational systems. I was really interested in Rosa-Blanca's conversation since I was learning from her. She provided details about that experience she had in that country and how wonderful it would be to have the same resources in the classroom. I agreed with her.

Rosa-Blanca continued sharing more information about the use of mobile devices and what the students are doing with them. The information she provided concerned me, and she told me that I looked astonished and surprised by what she said. I told Rosa-Blanca I was definitely surprised and concerned about what I heard (the details of this conversation will be woven into the chapter on analysis and findings). When I asked the last questions, about the support she received from stakeholders, I told her that I could stop the audio-recording in case she did not want to include something in the conversation; Rosa-Blanca did not have any problem with what she said was recorded. I thanked Rosa-Blanca for all of the information she provided and I we finished our conversation. Rosa Blanca's interview was around 50 minutes.

Third day of interviews. On April 26th, 2019, I arrived around 10:00 a.m. to make sure I had plenty of time to start with the interviews. I looked for Peregrino-Gris

and we both went to the private room to have the interview. I interviewed Peregrino-Gris at 12:00 p.m. He is 47 years old and is Spanish teacher. Peregrino Gris has been teaching for 23 years and is currently teaching 7th grade levels. I followed the same protocol as in the previous interviews. I provided Peregrino-Gris all the consent forms and he read them entirely. He signed them and kept the documents for his records. I asked Peregrino-Gris' for his WhatsApp contact information, where I could send the transcription of the interviews.

Peregrino-Gris seemed very open and enthusiastic during the interview. I provided the interview protocol questions, so he could be familiarized with them before answering. Once he finished reading the protocol, I began asking was mobile learning or mobile devices meant to him. Since he is a Spanish teacher, I noticed Peregrino-Gris was using technical and formal vocabulary when providing the responses to the questions. I asked every question established in the protocol and I could see gave a thorough descriptions of the activities he does in the classroom with his students using mobile devices.

During the interview, I thought perhaps Peregrino-Gris was not in favor of using mobile devices, because of his tone of voice and the body language he showed. He looked away and looked hesitant to answer. When I asked him to provide more details about how he felt that students brought mobile devices in the classroom, he took considerably more time to answer this question rather than the other questions. Then, he provided a detailed answer and gave his reasons about what he thought about students bringing their mobile devices in the classroom. I was content that I had acquired plenty

of information about his teaching practices and the use of mobile devices. The interview was 58 minutes.

Next, I interviewed Nicoyana at 1:00 p.m. She was waiting for me to let her know if she was able to enter the room. I told Nicoyana that it was fine to enter the room and to start our interview. Nicoyana is a Spanish teacher who is 40 years old. This is her first-year teaching at Luna Vista High School, but she has ten years experience teaching Spanish. At the time I interviewed her, she was teaching to 7th, 8th and 9th levels. I provided Nicoyana with the consent forms before we started the interview. I also provided the protocol interview, so she could be familiarized with them before we started the interview.

Nicoyana seemed very spontaneous and open when answering the questions. She seemed very engaged in the conversation about her teaching practices using the digital devices, since she has extensive experience in this area. I noticed that Nicoyana liked to smile. She seemed like a very friendly and accessible person during the interview. In every question I asked, Nicoyana she talked about the previous experience she had in the other secondary institution regarding the use of mobile devices. She described the activities she accomplished in the classroom. During the conversation I could see she was familiar with the use of technology in her teaching practices in the classroom. I was probing to ask more questions about what she thought about mobile devices, but I heard she was repeating some of the information she was giving; therefore, I decided to finish the interview. I asked Nicoyana for her WhasApp to send the interview's transcription. The interview was 46 minutes.

Fourth day of interviews. On April 27th, 2019 I met with Primorosa at a place located in downtown that was convenient to have the interview. The place was a cafeteria that had two sections. One is for the people to buy coffee inside and the other section has seating for people to enjoy the coffee outside of the cafeteria. The place was big enough to have a private conversation; thus, we decided on sit away from everybody. That place was convenient for the interview. We both were familiar with this cafeteria; usually people buy coffee and leave the place, thus we both decided that was appropriate to have the interview. I arrived earlier than 10:00 a.m. and made sure the audio recordings worked accordingly. Primorosa seemed relaxed and calm during the interview.

Primorosa is a Social Studies teacher who is 40 years old who has been teaching for 19 years. At the moment of the interview, she was teaching 9th, 10th, and 11th graders. Then, I provided the consent forms and she kept a copy for her records. She read the interview protocols and she was prepared to be interviewed. The interview was only 33 minutes since she had time constraints. During this interview, Primorosa was very brief when providing the answers to the questions. I probed, asking her for more insights about mobile devices, but she seemed quiet and did not give extensive information. I did not want to continue probing since I could see from her demeanor she was reluctant to give more information. After I finished the interview, I asked for her WhatsApp contact information to send the translated and transcribed interview.

The next person to be interviewed was Sol-Naciente at 11:00 a.m. We decided the place where I interviewed Primorosa was convenient to conduct the interview. I met

with Sol Naciente around 11:20 a.m. Sol-Naciente is a Social Studies teacher, who is 46

years old. She has been teaching for 26 years and is currently teaching 11th graders.

During Sol-Naciente's interview, we developed a very nice conversation. Since we had

met before, we talked briefly about my experience in Texas and my studies. Then, I gave

Sol-Naciente the interview protocol and she told me when she was ready.

The environment was favorable to have the interview, there were not many people

and it was cozy. I started the interview and she seemed knowledgeable about the topic.

She stated that she was interested in this topic. I did not have to probe much, because she

was providing very thorough descriptions. She was confident and enthusiastic about

sharing the information with me. Sol-Naciente's tone of voice was animated and vibrant

most of the conversation. I enjoyed interviewing Sol-Naciente, since I could see she is a

committed teacher with her students. The interview lasted 56 minutes.

Fifth day of interviews. On April 29th, I interviewed Soñadora at a different

location outside of Luna Vista High School around 3:30 p.m. We had already agreed to

meet at a private place close to the institution to avoid any students' presence. This

private place was a cafeteria close to the institution that had the appropriate conditions for

privacy. Soñadora is an English foreign language teacher, who is 33 years old. She has

12 years of teaching experience. I gave consent forms to Soñadora; she read them and

signed them in. I also provided the interview protocol for her to know the questions right

before the interview, so she could be familiar with the questions.

During the interview, Soñadora seemed willing and eager to answer all the

interviews questions. She provided detailed information about her teaching practices and

the use of the digital devices. Soñadora was engaged during the conversation, and she

provided relevant information about the topic under research. Even though she seemed tired after having a long day of teaching, she was agreeable to provide the necessary information. Based on what Soñadora said in the interviews, I saw that she was a very active teacher. She seemed engaged and committed to have students become successful learners. She stated that she looks for ways to inform students in different areas.

Additionally, she also seemed to have empathy towards the students' social situation and based her teaching practice on that. Soñadora also expressed that she has good communication with the students. She said the students have their WhatsApp contact information; it is open to every student, so they can have the confidence to tell her what they go through. This was something I admired about her, to have the desire to help her students in any way possible. Soñadora knows that she deals with a difficult population of students, and she knows the best way to deal with them is to give them the necessary attention they deserve. I congratulated her, because I know that would make a difference in the students' lives.

The interview with Soñadora was successful. I felt so proud of this teacher and what she is doing for her students. We promised that we could keep in touch and collaborate in the future. Then, I asked Soñadora what for her WhatsApp contact information so I could send her the transcripts of the interview. This interview lasted 56 minutes.

Table 5

Secondary High School Teachers Data Collection Timeline

Secondary Teachers Pseudonyms	Subject	Dates of Interviews	Time Spent in Interviews
1. Herediana	English	April 24th	43 minutes
2. Minnie	Social Studies	April 24th	40 minutes
3. Nicoyana	Spanish	April 26th	46 minutes
4. Peregrino-Gris	Spanish	April 26th	58 minutes
5. Primorosa	Social Studies	April 27th	33 minutes
6. Profe-Moreno	Social Studies	April 25th	51 minutes
7. Rosa	Spanish	April, 24th	51 minutes
8. Rosa-Blanca	Social Studies	April 25th	51 minutes
9. Sol-Naciente	Social Studies	April 27th	56 minutes
10. Soñadora	English	April 29th	56 minutes

II Phase of Data Collection

Transcription and translation of interviews. After I interviewed the teachers, I transcribed the interviews. It took me more than a month to transcribe all the interviews. This process included my conducting a word-for-word transcription in the original Spanish. I verified if the interviews were accurately transcribed; then, on July 25th, 2019, I sent the transcription to each participant through the WhatsApp number that they provided while I conducted the interviews, so they could corroborate what they said was accurate. During this time to review the interview transcriptions, the participants were told that they had time to revise their interviews and tell me if they had any modifications that they wanted made.

Soñadora suggested I should edit some grammatical mistakes, but she agreed that what she said was correct. Herediana suggested that I misspelled some words, and she

provided the correct spelling. I corrected the interviews as suggested, I sent the interviews again and Soñadora and Herediana agreed with the content. On July 26th, 2019, after I received each teacher's confirmation stating that what they said was according to the transcripts, I translated the interviews into English so that I could begin my data analysis. It took more than one month to translate all the 10 interviews, because I made sure the data provided by the teachers did not lose its meaning when translated from English to Spanish.

Next, the interviews were revised several times. The revision process of the interviews is part of the validation of the findings and to make sure the translation of the interviews into English did not lose the meaning the participants wanted to convey. On October 5th, 2019, I contacted three Spanish-to-English national advisors from the Costa Rican MEP to review that the translations of some expressions and words from Spanish to English were correct. In May 2019, I traveled to Costa Rica with a group of professors from Sam Houston State University to provide professional development to Costa Rican English foreign language teachers. During that trip, I had the opportunity to ask three stakeholders from MEP if they would help confirm if expressions and colloquialisms that my research participants used might have a different cultural connotation or meaning when these expressions and phrases are translated into English. The main goal of this panel of advisors was to corroborate the translation of certain colloquial expressions the interviewees expressed to ensure that they did not lose their meaning and were interpreted correctly.

During the proposal defense, the dissertation committee advised that it was critical that I should create a cultural and language committee to verify the accurate

translation of more colloquial expressions to strengthen the veracity of the data analysis and the findings of my research. To comply with ethical standards of research, I did not send the full transcripts; rather I only sent the phrases to the cultural and language committee.

After a rigorous and detailed reading of the data collected, I pinpointed 48 colloquial expressions and words (see Appendix I) to be reviewed by the cultural committee from Costa Rica. The members of the cultural and language committee are Manuel Rojas, M.Sc. National English Advisor; Ana Campos, M.Ed., Primary School English Advisor; and Alfredo Ortega, M.Ed., Secondary Education English Advisor. I created a chart with five columns where I wrote 48 expressions with the participants' verbatim expressions in Spanish and their English translation. In the other 3 columns, I wrote the names of the three English national advisors, where they could provide any comments or suggestions and indicate whether they considered if the translations did or did not reflect the original meaning.

I created a Google Doc, where I uploaded the Word document and I shared it with the cultural and language committee, including my dissertation chair, Dr. Hannah R. Gerber. On October 9th, 2019, I received the language and cultural committee's revisions and suggestions. After they provided their comments and suggestions, I took them into consideration and made the appropriate corrections in the translations.

Costa Rica's Sociopolitical and Economic Context During Data Collection

Shortly before my data collection, Costa Rica's socio-political and economic environment experienced a series of changes that affected the country and the society's atmosphere greatly. During the data collection process, the unions and teachers were

attempting to continue protesting the new educational policies and economic reforms the

elected government of Costa Rica was trying to establish for the country. According to

some interviewed teachers, these social, economic, and political changes have polarized

people and developed feelings of untrustworthiness, despair, and anger against the

government. This situation was part of the limitations I explained in chapter I and III.

Election of Costa Rican government on april 2018. The Costa Rican

presidential elections that were held on February 4th , 2018, resulted in a polarization

among Costa Rican citizens (Sonneland, 2018). Two parties with extreme political

views, conservative and liberal, ran for the new government of Costa Rica. The

conservative Restoration National Party, whose candidate was a Christian singer and

congressional representative, opposed abortion and same-sex marriage. These two social

issues were discussed in the previous years by different sectors of the Costa Rican

population, creating dissension among people. On the other hand, the progressive

Citizen's Action Party, whose candidate is Carlos Alvarado, favored gay marriage and

socially liberal policies. These two political positions led to discontent and

confrontations in Costa Rica, creating an environment of uncertainty toward Costa Rica's

socio-economic and political future.

Since Costa Rica is a generally conservative country, the presidential elections

turned into a controversial campaign (Sonneland, 2018). In the first elections held in

February 2018, none of the political parties running for the presidency of Costa Rica

obtained the necessary 40% of the votes in order to become the new government of Costa

Rica. However, after the first round of elections, the two political parties started an

intense campaign to gain the favor of the people, where social media played a significant role in people voting for the elected government (Alfaro, 2018).

The run-off election was held on April 1st, 2018, where the progressive political party, Citizen's Action Party, had a landslide victory over the conservative Restoration National Party. Social media platforms, e.g. Facebook, played a major role in Costa Rican's political preference during the second election's round (Alfaro, 2018). According to Iganacio Siles, a specialist in society and technology from Costa Rica, social media became crucial to forming political opinions and to leading a joint action. He also mentioned that the power of social media influenced the presidential elections and possibly defined its results (Alfaro, 2018).

Implementation of fiscal plan to restore fiscal sustainability. Generally, Costa Rica has been viewed worldwide as a peaceful and naturally rich country with a long history of democratic stability (The Heritage Foundation, 2019). Over the last four decades, Costa Rica's affluence has been sustained from a high-value added manufacturing and service-oriented economy (International Monetary Fund[IMF], 2019). However, the export of traditional agricultural products such as bananas, coffee, sugar, and pineapples, as well as its well-known ecotourism, are still Costa Rica's economic backbone (The Heritage Foundation, 2019). Additionally, Costa Rica is one of the most flourishing countries in Central America Common Market's five countries, with one of the highest levels of foreign direct investment per capita (Heritage Foundation, 2019).

During the last few years, Costa Rica has experienced some challenges that have affected its financial stability. Issues such as unemployment and income inequality have contributed to the increase of fiscal deficit and the public debt. The unemployment rate is

8.1% and the inflation is 1.6% (The Heritage Foundation, 2019). The former has placed Costa Rica in a vulnerable economic condition that has led the government to take measures to re-activate the economy and reduce the fiscal deficit.

The Costa Rican government implemented a series of economic reforms to restore fiscal sustainability and help reduce the public debt (IMF, 2019). One of these reforms is the fiscal plan, which "includes the conversion of sales tax into a value added tax (VAT), higher income taxes, wage restraint, and fiscal rule that ties down to the growth of spending—is expected to yield savings of about 4 percent of GDP over 2018-23" (CentralAmericaData.com, 2019, para. 8). This situation created a great discontent within the country, especially within the public sector since they alleged that this would affect the most vulnerable social classes.

The fiscal plan encompassed a series of economic measures to decrease the public economic debt. In this sense, the reforms sought to cut the public spending by reducing wages and other benefits paid to public sector. However, the main purpose of this tax reform is to make the sales tax into 13% Value Added Tax (VAT) on different goods and services; including other services such as medicines with a 2%, food with a 1%, and private medical services with a 4%. These measures would increase 1.2% Gross Domestic Product (GDP) and by 2022 it would increase 3.7 of GPD according to the Central Bank of Costa Rica (CentralAmericaData.com, 2019; IMF, 2019; telesur, 2018).

Public sector's strikes. Several institutions are controlled or belong to the government comprise the public sector in Costa Rica. For example, the Ministry of Education, Ministry of Health, Minister of Public Security, and Ministry of Culture and Youth are some of the ministries that are government-run entities in Costa Rica. The

Ministry of Education has one of the largest population of public workers in Costa Rica.

There are approximately 80,000 teachers that teach at pre-schools, elementary schools,

and secondary schools. The public workers used to benefit from different promotions

and other economic remunerations that support their salaries. These economic wages

come from a series of rights the public workers have gained as a result of the unions'

fights. Nonetheless, currently the Government of Costa Rica stated in the new fiscal

reforms that public workers do not receive economic wages to stabilize the decreasing

economy of the country. Different unions from the public sector do not agree with the

recent economic reforms of the new Government of Costa Rica, since they claimed these

reforms would hurt middle class' economy.

On September 10th, 2018, teachers' unions Asociación Nacional de Educadores

(ANDE*),* National Association of Educators and Asociación de Profesores de Segunda

Enseñanza (APSE), and the Association of Secondary Professors of Secondary Teaching,

went on an indefinite strike, protesting against the government's fiscal plan. This strike

lasted 96 days, causing millions of losses for the country, as well putting on hold

thousands of primary and secondary students' school year. During the strike, Costa

Rican teachers protested against the economic reforms the government sought to approve

to reduce the fiscal deficit and the public debt. According to Mélida Cedeño, president of

APSE, "the protest aims to show the public that the government and most legislators are

attempting to criminalize protestors and dissolve unions, as well as reducing wages of

public servants, especially in the education sector" (telesur, 2019, para. 2). Additionally,

the current Government of Costa Rica sought to eradicate the public workers' unions'

strikes, as a measure to fulfill what is stated in the fiscal plan.

At the end of the longest strike in the history of the country, the Government of Costa Rica approved the fiscal plan on December 5th of 2018. The Legislative Assembly of Costa Rica, against the discontentment of Costa Rican's public workers, approved the economic reform. The approval of the fiscal plan brought discontent and despair among Costa Rican's people. In this case, most of the goods and services were going to be taxed with the Value Added Taxed (VAT) by July 1st, 2019. Furthermore, the cut in the public workers' wages was already taking place, meaning that the new employees of the public sector do not receive any of these economic compensations in their salaries. In 2019, public workers' unions continued with strikes sparingly; however, the loss of credibility toward the Government of Costa Rica and the unions' efficacy was evident. Only the secondary teachers' unions remained strong and continued fighting over other educational reforms that are part of the stabilization of Costa Rica's economy.

Costa Rican's educational reforms to further stabilize Costa Rica's economy. In the advent of the fiscal plan, the Government of Costa Rica also sought to improve the competitiveness and foster inclusive growth with educational structural reforms (IMF, 2019). The Ministry of Education of Costa Rica is currently working, along with the Ministry of Finance, in different educational aspects such as to establish better educational outcomes, focus spending on early childhood and secondary students, strengthen the national assessments, implement dual education pilot program to develop vocational education, and reform the secondary assessment system (IMF, 2019). Some educators and students have seen these educational reforms as a threat to their well-being and rights. Thus, different strikes took place over September 10th, 2018 until December,

11th, 2018 months and have caused a new chapter in the history of the strikes of Costa

Rica (Elpaís.cr-EFE, 2018).

Secondary students' strikes and minister of education's resignation. On June

26th, 2019, students from a rural high school located in the northern east region of Costa

Rica started a protest against Costa Rican's educational reforms. Eighty students from

this rural high school closed the institution's gates and requested the Minister of

Education of Costa Rica, Edgar Mora, to resign from his charge as the Minister of

Education. Eventually, students from other regions throughout the country followed this

initiative and closed various high schools' gates opposing against the government's

educational reforms (Cordero, 2019a). The main reasons that triggered the students'

protests were the lack of information regarding the newest national assessments, the

implementation of dual education, and the construction of neutral bathrooms in the high

schools (Cordero, 2019a).

As part of the educational reforms to further stabilize Costa Rica's economy, the

strengthening of the national assessments is a priority (Equipo Técnico Departamento de

Evaluación Académica y Certificación, 2019). These new assessments are called:

Fortalecimiento de Aprendizajes para la Renovación de Oportunidades (FARO), that in

English stands for: the Enhancement of the Learning for the Renovation of Opportunities.

These assessments seek to replace the current national assessments, Bachillerato. As

mentioned prior, the Bachillerato national assessment is a test that students from 11th

grade must pass to be able to enter to public universities. Students have the chance to re-

take the test as many times as they can in order to pass it; therefore, if the students are not

able to do so on a first try, they have a second opportunity. However, according to the

new assessment standards, the Bachillerato tests are to be replaced by the FARO assessments at the end of the 2019. The main objective of FARO for secondary education is to determine the students' level of achievement in their learning process and the development of their skills at the 10th and11th grades respectively (Equipo Técnico Departamento de Evaluación Académica y Certificación, 2019). Secondary students will be tested in the following subjects: Mathematics, Science, and Spanish. These tests will be administered from November 25th to 29th, 2019.

In 2016, the *Consejo Superior de Educación of Costa Rica* [Higher Education Council of Costa Rica] approved a pilot project for dual education stipulated to take place in the Costa Rican educational system by 2017 (Díaz, 2016). Dual education is a "method where time is shared between the traditional classroom and work as an apprentice in a trade or professional specialty, in a company" (CentralAmericaData.com, 2016, para 1). This educational model is implemented in Germany's educational system to reduce youth unemployment, and, in Costa Rica, this is not the exception. The so-called Costa Rican ni-nis: *Ni estudia, ni trabaja* which means youth that neither work nor study are increasing at alarming rate (CentralAmericaData.com, 2016). "In the Central American region, the average unemployment rate for those aged between 15 and 24 is estimated to be around 11%, with lack of work experience being the main barrier to accessing the first job" (CentralAmericaData.com, 2018, para 1).

The Ministry of Education of Costa Rica (MEP) seeks to strengthen the articulation between the vocational technical formation and academic education that opens the possibility for high school students to have a work experience in different companies and continue their studies (CentralAmericaData.com, 2016; Díaz, 2016).

According to the MEP, this would help students to successfully transition from high school to the workforce.

The government of Costa Rica seeks to ensure human rights protection for trans-gender citizens as part of a global change that ensures the respect to socially diverse populations (Vivanco, 2018). The government of Costa Rica issued a directive and decree mandating government institutions to embrace and respect gender identity (OutRight, 2016). This initiative follows the Inter-American Court of Human Rights (IACHR) that established "efficient, inexpensive, and straightforward procedures to allow legal recognition based solely on the "the free and autonomous decision of each person." (Vivanco, 2018, para 2).

To ensure that these dispositions successfully take place in Costa Rica's society, the MEP presented a protocol that would prevent the LGTBI community from discrimination and being bullied in Costa Rican secondary schools. Among the different measures established in this protocol are (1) raising awareness about gender and sexual diversity within educators, (2) utilizing inclusive language, (3) allowing students to decide what to wear, depending on their gender identity, and (4) encouraging the use of gender-neutral restrooms (Azofeifa, 2019).

In regard to these new dispositions established by the MEP, Costa Rican secondary students protested against the construction of gender-neutral bathrooms. A large population of students alleged that there were other priorities in their educational centers that should be addressed by the MEP, such as the need of better infrastructure and more educational resources. To this, Costa Rican secondary students demanded that the Minister of Education, Edgar Mora, resign from his position. Many protests, street

blockages, and marches from secondary students took place in Costa Rica, creating a new socio-political phenomenon in the history of the country.

The strikes held by Costa Rican secondary students established a new chapter in the political history of the country. The secondary students' protests started on June 24th, 2019, at a high school in a northern eastern part of Costa Rica; eventually, other high school students from all over the country joined this movement claiming for the same requests. These protests continued for a three-week period, where secondary students did not assist schools and closed the institutions' gates. To this situation, the Ministry of Education of Costa Rica attempted to pacify the students and stop the students' strikes, but the students were firm with their petitions. Edgar Mora, in a national press release on June 27th, 2019 stated that his resignation as Minister of Education was not under any discussion (Cordero, 2019b). Edgar Mora contended that the students were being manipulated by false information, i.e., "fake news," a political party, and stakeholders from different unions (Cordero, 2019b).

More Costa Rican secondary schools joined the protests and strikes against the educational reforms and the Minister of Education. During these strikes, a number of public secondary schools remained closed, where secondary teachers were not allowed to enter to the institutions. The gates were locked, blocked by bicycles and trash, and controlled by the secondary students. To this, some secondary teachers stayed neutral to this situation; they neither support students' protests nor encouraged them to continue, but some other secondary teachers disapproved of this conduct.

Truck drivers and unions also joined the students' protests and asked the Minister of Education to resign. Street riots took place in the streets of Costa Rica, provoking

despair and sadness among Costa Ricans' citizens. This was the first time that Costa Rican students had an uprising in the history of the country. Despite the government's petitions to end the strikes and protests, the students, unions, and truck drivers continued complaining against the MEP's educational reforms and Mora's resignation. Ultimately, Edgar Mora resigned as the Minister of Education of Costa Rica on July 1st, 2019.

Edgar Mora's resignation as the Minister of Education of Costa Rica marked a milestone in the country's educational history. During his speech, Mora wished that after his resignation different venues for dialogue were opened and that mutual commitments could be established for our State of Law and constitutional precepts (Cerdas, Bravo, & Ávalos, 2019). Eventually, on July 9th, 2019, the Vice-Minister of Education, Giselle Cruz Maduro, became the current Minister of Education of Costa Rica (Cordero, 2019c).

Summary

In Chapter IV, I described the Methodology in Context where I explained (a) gaining access and establishing rapport; (b) recruitment of participants and informed consents; (c) interview process and participants; (d) transcription and translation of the interviews; (d) Costa Rica's sociopolitical and economic context during data collection.

CHAPTER V

Findings: Data and Analysis

Chapter Overview

In Chapter IV, I explained in detail the methodologies employed to collect data. I included information regarding the sociopolitical and economic context of Costa Rica that took place right before data collection. In Chapter V, I describe how I analyzed the data. First, I explain the analysis plan that I followed to conduct the Interpretive Phenomenological Analysis (IPA) (Giorgi & Giorgi, 2008; Smith et al., 2009). Then, I describe Creswell's (2013) model of analysis that I employed, including some strategies suggested by Smith et al. (2009) to do IPA analysis. Based on Leech and Onwuegbuzie's (2010) 13-Step Methodological Framework, I continued with Step 9: determine the analysis of data.

Step 9: Determine the Analysis of Data

Before the analysis process, I decided to organize my ideas following an analysis plan that could help me visualize the road map I was going to follow before the analysis. Thus, I used the chart suggested by Guest, MacQueen, and Namey (2012). I considered this analysis chart useful for determining relevant information before conducting the data analysis and be focused on the process. First, I established the objectives of my analysis, which were to provide thick descriptions of the phenomena and interpret the participants' data. Then, I reviewed the research questions that led my research. The research questions before the data analysis were:

1. What are select Costa Rican secondary teachers' perceptions of their experiences regarding the incorporation of mobile devices in the classrooms?

2. How do these perceptions of their experiences influence their likelihood of using mobile devices in the classrooms?

3. How do these perceptions of their experiences influence their likelihood of banning (or not supporting) mobile devices in the classrooms?

Model of Data Analysis

As stated in Chapter III, I employed Creswell's (2013) spiral model to analyze the data under the light of Interpretive Phenomenological Analysis (IPA). Creswell (2013) employed a series of steps to conduct the analysis as follows: (a) organize, convert, and store the data into a technological device; (b) read the information several times to get the gist of the information; (c) write memos or notes in the margin of the transcripts to refer to them later in the analysis process; (d) describe, classify, and interpret the data; (e) categorize the information into codes and themes; (f) interpret the data; (g) represent and visualize the information.

Interpretive phenomenological analysis. To be consistent with IPA, where the researcher provides a detailed examination of the participants' lived experiences (Smith et al., 2009), I examined the information through my world view experience and provided a detailed description of participants' perceptions of their experiences. Additionally, IPA seeks to interpret the phenomena through the participants' lens, which is in constant change. This interpretation would help to make sense of the participants' lived experiences and the meaning they derive from these experiences in the specific contexts where they take place. Smith et al. (2009) also added that we are human meaning making organisms trying to understand the world where we live in. Therefore, before moving to general claims, I analyzed in detail each participants' case and provided the necessary

information that supported the findings (Smith et al., 2009). In this case, the researcher

needs to uncover the individual's life through the lens of culture and socio-historical

meanings because people are continuously embedded in a world that contains meaning

(Eatough & Smith, 2008; Smith et al., 2009). To accomplish this, I wrote extensive

annotations and memos during and after reading the interviews. I also reflected upon the

participants' experiences by questioning their statements and thinking deeply about the

message they wanted to convey. My personal experience also played an important role

for understanding the participants' perceptions about the incorporation of mobile devices

in the classrooms.

Smith et al. (2009) explained that in IPA there is not a "prescribed single method"

(p. 79) to conduct the analysis. IPA is an iterative and multi-analytical process, where the

researcher can follow steps that lead to the in-depth descriptions of the phenomena under

research. Hence, Smith et al. (2009) suggested a series of strategies to include in the

analysis process to meet the IPA goals. Some strategies I employed to conduct IPA

within Creswell's (2010) analysis model included: (a) a close line-by-line analysis of the

experiential claims, concerns and understanding of each participant; (b) a dialogue

development between the researcher and coded data writing memos throughout the data

analysis, where I addressed what was significant for each participant regarding their

specific context and experiences; (c) identification of emergent patterns, usually first in

single cases and subsequently across multiple cases; (d) organization of the data into

themes and clusters; (e) use of supervision, collaboration to test the coherence of the

content and themes with the help of my dissertation chair; (f) developing a full narrative

by detailed commentaries following a theme-by-theme model, employing data extracts

that will exemplified each of the themes; (g) reflecting on the process as part of the validation of data.

Analyzing large sample sizes in interpretive phenomenology analysis. IPA recommends 3 to 6 participants to be recruited for novice researchers; however, for a large sample size, Smith et al. (2009) suggested developing the recurrent themes, with some extracts of the interviews that embody the participants' voices. This would develop a "group-level analysis" (p. 114). Jonathan Smith, the creator of IPA (2009), explained that for large sample sizes in IPA, "it is vital to choose representative quotes to capture the experience under discussion" (personal communication, November 13, 2019). Smith also indicated that the researcher decides which quotes represent how the themes are manifested in the different participants, and the convergence and divergence are discussed after the quotes.

For the narrative of the findings, I followed the suggestions provided by Smith and guidelines from IPA. In the narrative of the findings, I captured the core meaning of the participants' lived experiences and perceptions by stating what they persistently reported in during the interviews. Since IPA emphasizes the importance of the idiographic aspect by describing each case in detail, when analyzing large sample sizes, I selected "a limited number of transcripts extracts from the compiled file of extracts for each theme… [and they should] represent the range of views in a group" (Smith, et al., 2009, p. 115).

Smith et al. (2009), also suggested that other extracts can be selected by the emotion or empathy they elicit, and if they capture the readers' imagination.

In IPA the claims should be accurate and trustworthy to represent the voices of the participants across the themes (Smith et al., 2009). When writing the findings in a generic style narrative, it is pivotal that the researcher looks for themes that are represented in most of the cases. Therefore, I used tables with cross-referenced themes as a visual representation that let the readers ascertain the commonalities of the themes across the participants.

Another recommendation is to provide a long quote from one of the participants and short quotes from others (Smith et al., 2009). Smith et al. suggested that the quotes provided in the writing stem from the entire population, to respect their voices. In this fashion, I proportionally organized the quotes I used to describe the findings by extracting all of the quotes that represented the emergent themes from NVivo12 and pasting them on a Word document. After reading the quotes several times, I decided on the excerpts that were most representative and aligned with each theme. Then, I visualized an outline with their respective subtopics that emerged after reading the quotes that I followed to make sense of the participants' voices. In this way, the findings draft was coherent and easy to read.

Lastly, for IPA it is necessary to be cognizant of the hermeneutic cycle through the analysis process and move between the parts and the whole of the corpus of data (Smith et al., 2009). Thus, to be consistent with this IPA's principle, I read and re-read each of the interviews several times and tried to make sense of what the participants wanted to convey.

Step 1: Organize, convert, and store the data into a technological device. After

conducting detailed research on different qualitative analysis software, I decided to use

NVivo12, because it had a user-friendly format and layout. I paid for the student license

for two years, which had some limited features; however, the student's version was

powerful and resourceful with innovative tools for the data analysis. To be familiar with

NVivo12 features, it took me several days to explore the ins and outs of the software.

Once I was familiar with the program, I uploaded all the transcribed and corrected

interviews into NVivo 12 in order to conduct the IPA analysis. I created a folder with all

of the transcribed interviews to have them organized in one single source**.**

Step 2: Read the information several times to get the gist of the information.

After the transcriptions were uploaded to NVivo12 software, I printed all ten interviews

and I started reading them to familiarize with the information. For IPA, it is necessary to

re-read the information to "ensure that the participant becomes the focus of the analysis"

and "to enter a phase of engagement with the data"; in this way, the researcher will

establish the rapport and provide trustworthy information during the data analysis (Smith

et al. 2009, p. 82). Then, I listened to the different interviewees' audios, read and re-read

the transcripts in Spanish and in English several times. I also made sure that each

interview did not lose the meaning during the translation process, and that the

information provided in Spanish was accurately translated into English.

Afterward, I applied the strategy that Smith et al. (2009) suggested for IPA

analysis. I started analyzing line-by-line the claims and participants' perceptions of the

experiences regarding the use of mobile devices in their school context. This technique

in IPA is essential to avoid the superficial reading that can delve into non-relevant and

non-accurate comments regarding the participants' concerns under research. However,

based on the large corpus of data obtained from the ten interviews, I decided to employ a

reductionist data technique suggested by Guest et al. (2012), where I included only the

"domains of interest" to be incorporated into the analysis plan of a qualitative research (p.

130). In addition to this, Smith et al. (2009) in their book, *Interpretive Phenomenological*

Analysis: Theory, Method and Research, discussed that for large samples in IPA analysis,

the researcher can concentrate on the data that has a phenomenological focus, which

would enable the researcher to remain close to the participants' meaning of their

experiences. Thus, in the third reading of the interviews, I used a "key-word-in-context

or KWIC", approach where I identified a word as the locus for a theme or concept in the

interviews before doing the coding (Guest et al., 2012, p. 51). Therefore, depending on

the interview questions protocol, I classified with KWIC the different segments of the

interviews.

Then, I wrote in the transcripts' hard copies a key word that helped me visualize

and map out which specific sets of data were addressing the participants' most salient

characteristic or comments of their perceptions and experiences using mobile devices in

their teaching practices. During the interpretation and analysis process, I could go easily

back to the information that I needed it to analyze in more detail.

A noteworthy aspect to mention is that Smith et al. (2009), indicated that it may

take several weeks to months for the researcher to fully complete this process of

transcribing, coding, and analyzing the data according to IPA analytic methods. This also

depends on the corpus of data the researcher collected. Hence, it took four months for me

to complete the data analysis because of the corpus of data obtained from the ten interviews.

Step 3: Write memos in the margins of the interviews to refer to them later.

Following the second strategy for IPA, I wrote memos for each interview to establish a dialogue between the researcher and the data. This strategy is pivotal to understanding how and why the participants have the concerns that they indicated during the interview. In this regard, "this involves looking at the language that they use, thinking about the context of their concerns (their lived world), and identifying more abstract concepts which can help… to make sense of the patterns of meaning in their account" (Smith et al., 2009, p. 83).

Once the interviews were uploaded in NVivo12 software, I read the information thoroughly and annotated within each interview what the participants meant in each identified segment of information using KWIC strategy that was relevant for their perceptions of experiences when using mobile devices. A specific feature of NVivo12 software enabled me to annotate my insights in the segments of the interviews that I thought compelling and relevant to answer the research questions. I took enough time to read the information provided by the interviewees and wrote annotations for each single case. In NVivo12, I had the opportunity to code the annotations and make a cross-comparison with the codes and themes of the interviews. This is presented later in this chapter. This process provided me with a more in-depth analysis during the narration of the findings.

During the annotation process, I paid close attention to the language, the context, and the meaning the participants conveyed about the phenomenon under research. In this

sense, I asked myself questions regarding to what the participant wanted to express in their message. According to Smith et al. (2009), this questioning was helpful to create empathy to be in the participants' shoes. I also highlighted words that were relevant for the conversation. Some examples of these words were "beautiful," "I love it," "I don't like this." These are words enclosed strong feelings and perceptions towards the phenomenon being studied. I also listened to the audios and the intonation the participants added to the words.

Finally, to understand the participants' meaning of their conversations, I placed myself in the situation they were describing and tried to determine what the participants were attempting to convey through my own lens. One of the activities to help me understand teachers' perceptions of their experiences was a reflective journal and the annotation process while analyzing the interviews. According to Smith et al. (2009), the researcher engages in a double hermeneutic process, where she tries to make sense of what the participant is trying to make sense of what is happening to him. In this sense, according to Smith et al. (2009),

> This captures the dual role of the researcher. He/she is employing the same mental and personal skills and capacities as the participant, with whom he/she shares a fundamental property-that of being a human being. At the same time, the researcher employs those skills more self-consciously and systematically (p. 3).

Smith et al. (2009), also adds that the researcher is like every other human being, trying to make sense of the world, drawing out of their own resources. On the other hand, the researcher is not the participant. He is trying to access to each participant's reported experience through the "researchers' own, experientially-informed lens. So, in

that sense, the participants' meaning making is first-order, while the researcher's sense-making is second order" (p. 35).

Thus, based on my previous experience and the information I could get from Luna Blanca High School, I made the connections with the participants' concerns regarding mobile devices at schools through the memos. Some of the participants described their activities using mobile devices, which were limited by the lack of adequate infrastructure and resources. I related to these statements as I worked in an institution similar to Luna Blanca High School.

Step 4: Describe, classify, and interpret the data. During this step, I wrote extensive memos based on the overall information I obtained after reading the interviews and doing the annotation. It is noteworthy to mention that in NVivo12, the researcher has the option to write annotations and memos. I used the annotation feature to immediately document the insights and comments I obtained from the second reading of the interviews. This helped me to have a better understanding of the interviews and be familiar with the participants lived experiences.

The memo writing was done after reading the entire interview and documenting each annotation for each participants' case. The memo writing helped me to consolidate the overall information obtained after reading the interviews by describing and classifying the data. I followed this model for each interview. This was a complex and extensive process that took several weeks to be successfully completed. During this stage, I made sure that I did not overlook any important aspect or experience the participants provided during the interviews. This meant that I highlighted in the interviews the sections that were exclusively related to the participants' experiences.

According to Smith et al. (2009), the memo process or annotation are two of the most detailed and large undertakings of IPA that should be taken into serious consideration before coding and theming of the data (Saldaña, 2016). This process would provide the information about what the experience for each participant was like, the meaning the participant was giving to this experience, and what is happening to the participant (Smith et al., 2009). In IPA the meaning of a text can be derived at a "number of different levels, all of which relate to one another, and many of which will offer different perspectives on the part-whole coherence of the text" (Smith et al., 2009, p. 28).

Step 5: Categorize the information into codes and themes. To code the data, I employed In Vivo, Emotional, Processing and Concept coding (Saldaña, 2016). During the coding process, I considered it necessary to include Concept Coding. Eventually, after coding the information, I employed Theming the data (Saldaña, 2016). According to IPA, it is pivotal to start coding each case in particular. This particularity has to do with "idiography," where IPA works in two levels, in a sense of detail and the depth of analysis (Smith et al., 2009, p. 29). Additionally, IPA tries to disclose how particular experiential phenomena have been assumed by particular people in a particular context. Thus, the IPA researcher focuses on singular cases claims and moves to more general claims by connecting the information obtained in every single case to the general cases (Smith et al., 2009). Since I was familiar with the interviews after the annotation and memo process, the coding was faster. I coded all the interview information one at a time, paying careful attention to the perceptions of participants' lived experiences using NVivo12. Once the interviews were uploaded on NVivo12, I made sure that all of the information was correct.

I read each of the interviews again. This process was faster, since I was familiar with the data from the previous readings. I looked for words and expressions that were appealing to participants' perceptions or experiences. I coded the ten interviews, and I used different categories of codes including Processing, In Vivo, Values, Emotion, and Concept coding. I revised the interviews several times to verify whether the codes reflected the messages were those that the participants wanted to express.

To select the appropriate excerpts from the interviews to represent the themes that emerged from the data analysis, I followed a procedure that helped me visualize which excerpts were significant for each theme. In this fashion, I used NVivo12 to extract the quotes that represented the themes and pasted them into a Word document. Then, I organized the participants' quotes by the emergent themes, so it could facilitate the description of the findings. I read the excerpts many times to make sure the quotes fully represented the themes; thus, I followed an outline that comprised the main themes with their sub-themes and their corresponding excerpts. In this way, I organized the participants' information to write a coherent draft. I also used my reflection journal and my memos to triangulate the information and obtained more valid outcomes.

Step 6: Interpret the data and Step 7: Represent and visualize the information. When I analyzed the information, I used matrices, word-clouds, word-trees, and graphics that NVivo12 provided. These techniques were helpful for determining the relationship between data and obtained the superordinate themes. I extracted the codebook with NVivo12 that has cross-reference code feature (see Appendix H). I started analyzing the codes. I also examined the data in light of the research questions. These research questions were:

1. What are select Costa Rican secondary teachers' perceptions of their experiences regarding the incorporation of mobile devices in the classrooms?

2. How do these perceptions of their experiences influence their likelihood of using mobile devices in the classrooms?

3. How do these perceptions of their experiences influence their likelihood of banning (or not supporting) mobile devices in the classrooms?

From the codebook, I had the opportunity to check the recurrence that each code had within each of the participants. The total numbers of the codes were 107. The highest referenced codes by the teachers were (a) teachers' rules in the classrooms; (b) limitation of resources; (c) teachers implementing the use of mobile phone for educational purposes in the class; (d) teachers concerns about the use of mobile devices in the classrooms; (e) lack of opportunities for professional development. These codes provided an idea of the emergent patterns and trends from the interviews. Then, I created a chart with the corresponding superordinate codes and subordinate-codes (see Figure 1). Afterward, I went back to NVivo12 program and scrutinized the annotations and memos I had from the interviews to have a better perspective of the data and continue drafting the emergent themes. This reflected the iterative process in IPA that Smith et al. (2009) mentioned to get the data's themes and not overlook relevant information for this purpose.
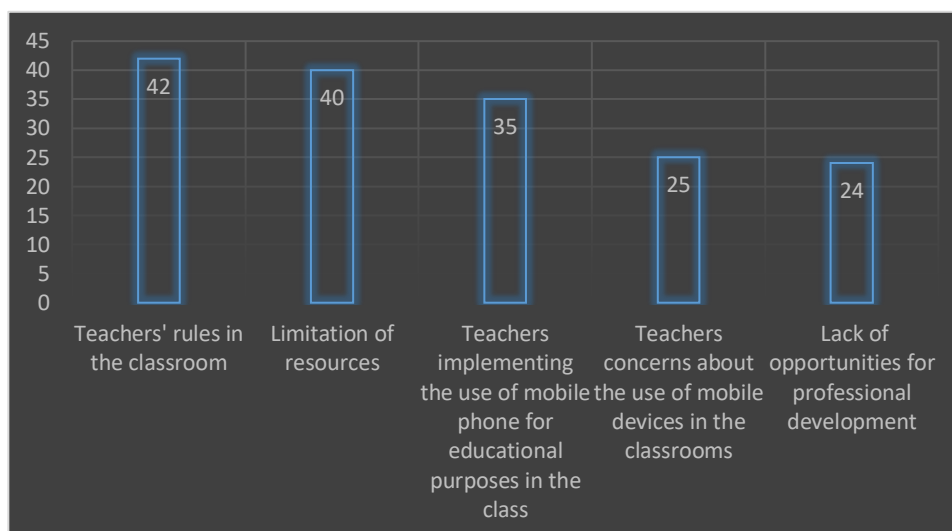
Figure 1. This graphic bar represents the most refereed codes from the analysis of the participants' interviews. Each bar represents the times the participants of the study mentioned each of the five codes that were highly refereed. This graphic bar was created using NVivo12 software.

Emergent themes from codes. To start drafting the emergent themes, I extracted the matrix with all of the codes and visualized which were the highest refereed codes on an Excel spreadsheet. I paid careful attention to the codes and sub-codes and the times they were reiterated by the participants (see Table 6). Then, I reviewed the codes and I identified different patterns across all of the codes. The patterns I identified were the following: (a) negative perceptions of the use of mobile devices in the classrooms; (b) positive perceptions of the use of mobile devices in the classrooms; (c) lack of resources; (d) teachers setting limits to use mobile devices in the classrooms; (e) need of professional development; (f) lack of support from stakeholders.

Table 6
Overaching Code and Subcodes

Overarching Code	Sub-Codes
Teachers rules in the class	Teachers' negotiating the use cell phones in the class Lack of guidelines to use the mobile phone Teachers' negotiation with the use of mobile phones Accepting using phones in class Adapt to new technologies
Limitation of resources	Lack of security in the classrooms Resources at school Low students' socio-economic status Lack of support from stakeholders Students limited access to internet
Teachers implementing mobile phones for educational purposes in the class	Beneficial for teaching Engagement/motivation Looking for concepts Reading with mobile phones Mobile phone's features-convenience
Teachers' concerns about the use of mobile phones in the class	Mobile devices harmful and beneficial for teaching Bad behavior Addiction to the use of mobile phones Distraction by the use of mobile phones
Lack of opportunities for professional development	Isolation-frustration Lack of communication with principal Lack of knowledge to use mobile devices Fear to use the mobile devices Limited use of mobile devices

Once I identified all the themes from the codes, I decided to group all the resulting

codes from the analysis in each theme. Thus, I carefully observed each of the codes and

determined which codes with their corresponding refereed numbers belong to the

identified themes. I then grouped the codes with their corresponding reference numbers

in an Excel sheet and added them to determine which emergent theme had the highest

refereed codes number. According to Figure 2, negative perceptions of the use of mobile

devices in the classroom had the highest numbers with 24 %. The other themes that also

emerged were positive perceptions of the use of mobile devices in the classrooms with

21%, lack of resources with 18%, teachers setting limits to use mobile devices in the

classrooms 15%, need of professional development 13%, and lack of support from

stakeholders 9%.
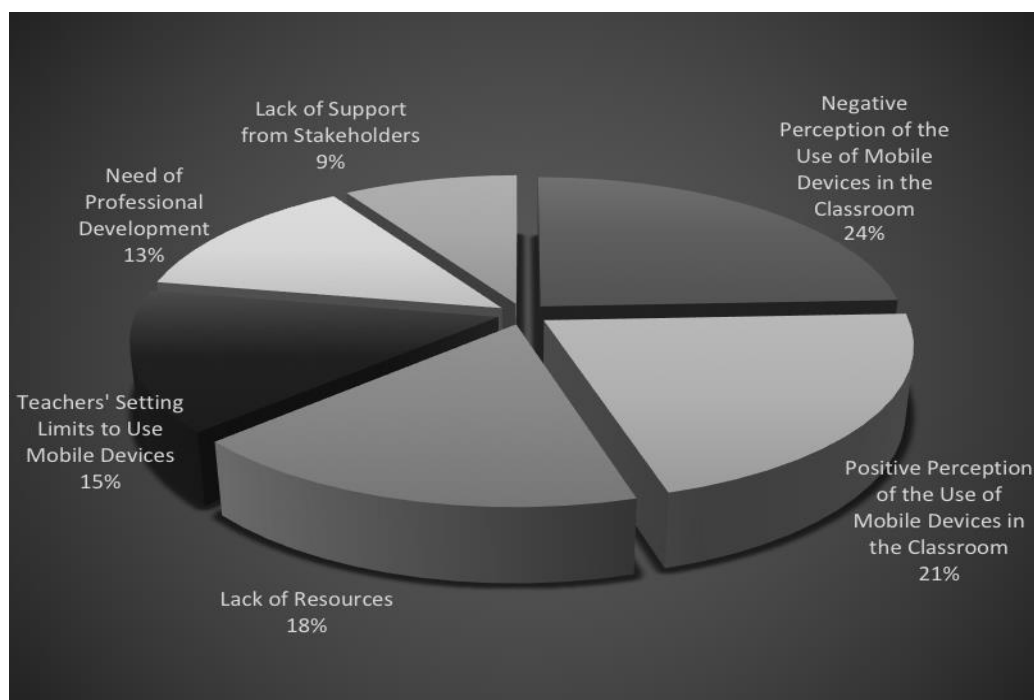

Figure 2. Emergent themes from codes. This pie graph represents the themes that resulted from adding the codes I obtained from the data analysis. I listed and organized the codes in an Excel sheet under the theme that was emerging from the analysis of the data. Then, I added the codes and obtained the percentages reflected in the pie chart. This pie chart was created using an Excel sheet.

Word-cloud. The second technique I used to compare data and polish the emergent themes was Word-Cloud from NVivo12. With this feature, I could determine the words that were most repeated in the codebook, the interviews, and memos either individually or as a group. I was interested in finding the most repeated words from the interviews, the codes, and memos. The first three words that are prominent from the word-cloud were the following: "students," "using," "technology" (see Figure 3). This finding paralleled with the emergent themes from the codebook. In this case, the use of technology by the students was consistent across the data. Also, "giving," "like," "school," "knows," and "teacher" were frequent words that reflected the insights from the data.
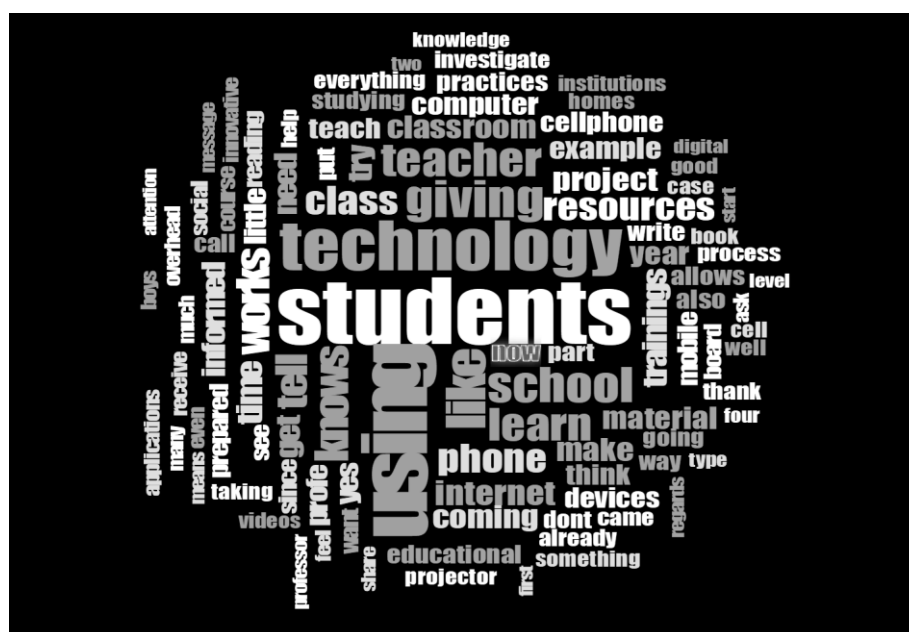

Figure 3. Highest word frequency from the interviews, codes, and memos. This Word-Cloud represents the highest words frequency that I obtained from NVivo12 when I combined the interviews, codes, and memos. This feature from NVivo12 helps to visualize the most common word across different data sets.

Table 7 indicates the weighted percentage of the words from the word-cloud. I decided to choose the first 12 words, since they had a representative number of times they were mentioned by the participants. The rest of the words had less than 2000 references. Additionally, these first 12 words mirrored the findings stated in the overarching codes and sub-codes. The word "student" was said by teachers and in the memos 7,531 times. The word "using" was mentioned 7,400 times, with its derivations such as: use, useful, using, uses. Finally, the word "technology" was uttered 5,424 times. It can be inferred from this Word-Cloud that students are the main concern through the interviews by the participants and the way they are using or have used technology. Other words that were also appealing to keep drafting the emergent themes were "school," "knows," and "teacher." It could be assumed the place where students are, their knowledge about technology and the teachers' role are also crucial aspects to take into consideration for the analysis of the findings.

Table 7

Weighted Percentage of First 12 Words in the Word-Cloud

Word	Length	Count	Weighted Percentage	Similar Words
students	8	7531	1.99%	student, students, students', students'
using	5	7400	1.95%	use, used, useful, uses, using
technology	10	5424	1.43%	technological, technologies, technology
school	6	3557	0.94%	school, schools
knows	5	3339	0.88%	know, knowing, knows
teacher	7	3300	0.87%	teacher, teachers, teachers', teachers'
learn	5	3141	0.83%	learn, learned, learning, learns
phone	5	2669	0.70%	phone, phones
resources	9	2503	0.66%	resource, resources
time	4	2371	0.63%	time, times
internet	8	2140	0.56%	internet
trainings	9	2099	0.55%	train, trained, training, trainings

Word-tree. Next, with NVivo12, I extracted the word-trees of the first three most frequent words from the Word-Cloud. This feature from NVivo12, allowed me to add some context to the words; therefore, I could see the connections that each word had with the codes, interviews and memos (see Figure 4). I started analyzing the word "student" and the data participants provided regarding "students." I ascertained that the word "students" was related to the way students used their mobile devices inside of the classrooms according to teachers' perspectives. I also noticed that there was a difference between what teachers perceived when using the mobile device in the classrooms with the students for educational purposes, versus when students used their mobile devices otherwise within the classroom. I could also determine that teachers perceived the use of a mobile device as helpful as an educational tool, but that it is also detrimental for the students if they did not use it for prescribed educational activities. I could infer there were mixed perceptions by the teachers about the use of mobile devices by students in the classrooms.
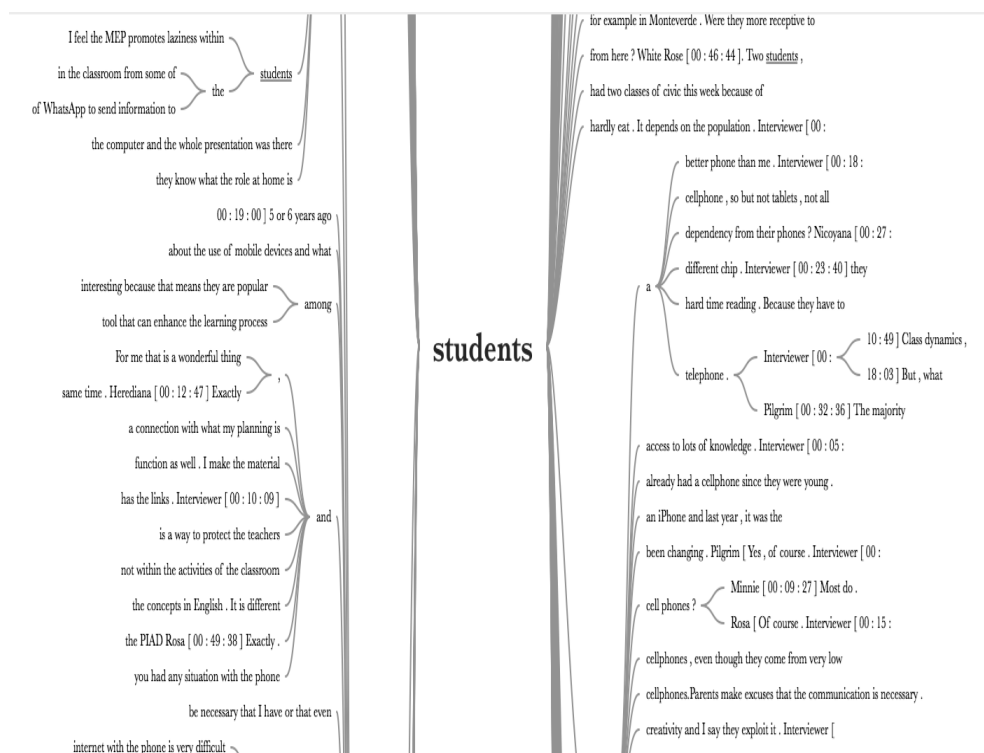
I feel the MEP promotes laziness within

in the classroom from some of

of WhatsApp to send information to

the the students

the computer and the whole presentation was there

they know what the role at home is

00 : 19 : 00] 5 or 6 years ago

about the use of mobile devices and what

interesting because that means they are popular

tool that can enhance the learning process among

For me that is a wonderful thing

same time . Herediana [00 : 12 : 47] Exactly ,

a connection with what my planning is

function as well . I make the material

has the links . Interviewer [00 : 10 : 09]

is a way to protect the teachers and

not within the activities of the classroom

the concepts in English . It is different

the PIAD Rosa [00 : 49 : 38] Exactly .

you had any situation with the phone

be necessary that I have or that even

internet with the phone is very difficult

students

for example in Monteverde . Were they more receptive to

from here ? White Rose [00 : 46 : 44] . Two students ,

had two classes of civic this week because of

hardly eat . It depends on the population . Interviewer [00 :

better phone than me . Interviewer [00 : 18 :

cellphone , so but not tablets , not all

dependency from their phones ? Nicoyana [00 : 27 :

different chip . Interviewer [00 : 23 : 40] they

a hard time reading . Because they have to

10 : 49] Class dynamics ,

telephone . Interviewer [00 : 18 : 03] But , what

Pilgrim [00 : 32 : 36] The majority

access to lots of knowledge . Interviewer [00 : 05 :

already had a cellphone since they were young .

an iPhone and last year , it was the

been changing . Pilgrim [Yes , of course . Interviewer [00 :

Minnie [00 : 09 : 27] Most do .

cell phones ? Rosa [Of course . Interviewer [00 : 15 :

cellphones , even though they come from very low

cellphones . Parents make excuses that the communication is necessary .

creativity and I say they exploit it . Interviewer [

Figure 4. This is an extract of the word tree of *students.* The word *students* is the most common word in the interviews, coding and memos. This figure was obtained from NVivo12 word-tree feature. This allowed me to see the content related to this word to have a better perspective of what participants said.

Then, I decided to combine the three most recurrent words, "student,"

"use," and "technology," to determine the connection these three words

provided (see Figure 5). NVivo12 has a feature that provides the content related

to the combination of the words that the researcher decides. This helped me

visualize whether the emergent themes from the coding were also reflected in

the data provided by the teachers. Therefore, when analyzing this information, I

could determine that most of the expressions described the way mobile devices

were used by the students and teachers in the classrooms. I could see the

advantages and disadvantages of using mobile devices for the teaching

practices. The lack of resources and the establishment of boundaries for the use

of mobile devices in the classrooms was also noticeable. I could deduce from

these data that the use of technology and/or a mobile device is a daily issue in

the teachers' school activities and the students' lives. The need to limit the use

of mobile devices by students to avoid distractions or other detrimental

situations that can interfere with the students' learning-teaching process was

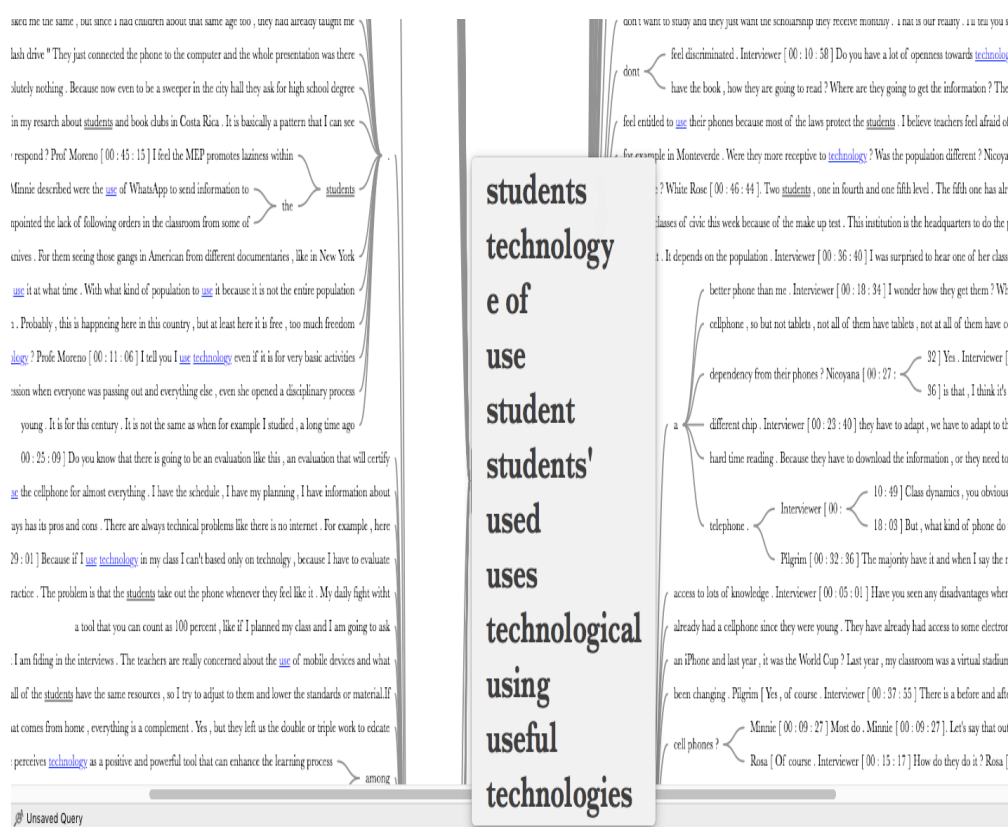also reflected by the teachers' experiences and perspectives

Figure 5. Word-tree combination of the three most recurrent words from the codes. I captured this image from NVivo12 software to understand how the data was related to these three words according to the participants' perspectives. This helped me expand on my findings about what teachers' perceived between students, technology and use.

Findings

Based on the process of analysis, I determined the two superordinate themes that captured Costa Rican secondary teachers' perceptions of experiences when using mobile devices in the classrooms. To obtain the two superordiante themes, I made a cross comparison with the memos, annotations, and reflective journal; thus, I printed out all the information obtained from the NVivo12, then I put it all together on a table and made connections to be more familiar with the data. I looked back at the research questions and made the necessary associations with the data I had already analyzed. This process was the iterative cycle that Smith et al. (2009) described in the analysis of the information for IPA. It is important to go back and forth from the analyzed information to provide with consistent and valid themes. This procedure also enables researchers to gain a clear picture of what the participants expressed in the interviews and not leave any data out of the analysis process. I organized the final themes as follows through the superordinate themes encompassed:

- Mobile devices: a double-edge sword, and

- Teachers' perceived challenges to succesfully incorporate mobile devices in the classrooms.

Then, I created an outline with the main themes and sub-themes to organize each excerpt; afterward I created two graphic organizers to represent the themes and sub-themes.

Each superordinate theme incorporates subordinate themes that enlighted and provided greater support to the analysis. To write the analysis, I looked for

the different interviews' excerpts that informed the superordinate themes I

found during the data analysis. Likewise, I used different graphics and figures

to illustrate the findings of each theme (see Figure 6).

Figure 6. These are two graphic organizers combined representing the final themes of the findings. The first graphic organizer has Theme 1 and the second graphic organizer has Theme 2. I created these graphic organizers using SmartArt from Word Document.

Theme 1: Mobile Devices: A Double-Edge Sword

"*But the phone is a double-edged sword. It is a double-edged sword, but when it is used for pedagogical purposes, I feel it is very useful. It's a good tool.*" --Nicoyana. The analysis of the data provided a rich descriptions and insights of the different teachers' perspectives and experiences regarding the positive and negative effects of the use of mobile devices in the teaching practice. Generally, teachers were concerned about the use of the mobile devices (such as the mobile phone) by the students, because of the negative effects they perceived the mobile devices have on them. On the other hand, teachers also indicated that mobile devices (such as the mobile phone) are part of the students' daily activities and are adventageous to have students engaged and motivated to do in-class activities.

Sol-Naciente expressed that technology is beneficial for her teaching practice, but it could also bring negative effects on students:

It is a double-edged sword. It depends on how you use it. If you use it for good purposes, technology will be your ally, your best friend, because it allows you to develop your class. In my case, it allows me to develop the class and allows me to learn, because before we used books to get the information when I was planning. Now, I only have the computer and I open several tabs on Google and I search for PDF books and I have everything there. Then it is up to you as a person if you want to use it for good purposes …but if you resist to the change, it will be detrimental for you.

Sol-Naciente emphasized that it depends on how teachers and students use these technological advances in the classrooms. It is a double-edge sword; a positive edge and a negative edge, depending on the purposes people use technology. For Sol-Naciente technology is beneficial for her lesson planning, because she can have more access to information. On the other hand, Sol-Naciente stated that not using technology could be "detrimentral" and it is better not to "resist to the change."

I believe, in the entry that described Sol-Naciente on page 195, she was aware that technology is present in today's society and that activities that are not related to technology may be less effective for her students and teaching practice. Also, Sol-Naciente said that resisting "change" is "detrimetral." In this interview, she also referred as the mobile device as an "electronic pacifier" that students are constantly using and if not used in the classroom, students may find the learning process less engaging. Sol-Naciente was cognizant that teachers need to be immersed in the technological world that is in constant change, and which students are highly engaged.

Soñadora was also aware that mobile devices are what youth are currently using. Even though it might involve some negative side effects, Soñadora felt that it is fundamental to know how to use mobile devices in their teaching practice responsibly, since students are using mobile devices daily. The need to know how to use mobile devices in their teaching practice effectively was a recurrent pattern present in most of the interviews conducted with Costa Rican secondary teachers. It can be assumed that this situation

compelled teachers to incorporate the mobile technologies in the development of their teaching practice. To this Soñadora expressed the following:

> But regarding technology, it is something that we have to know better, because it is what the teenagers are using now. They were born and they have grown up using the tablet or the phone. They handle it better than us.

Another noteworthy aspect Soñadora mentioned was that students handle the mobile devices better than teachers do. It can be inferred that Soñadora knew that there is a difference between her students' digital skills or knowledge to manipulate and navigate using their mobile gadgets. Nicoyana added to this that she was from a generation different from her students. She expressed the following:

> Because it is the technological era that it is the era of the young. It is for this century. It is not the same as when for example I studied, a long time ago. The students were born in this era. And that entices them… And I think that it is easier to learn with technology, than with the traditional classes as I learned.

Based on these entries, it can be assumed that participants perceived students are living in a different era, and that knowledge plays an important role when manipulating or using technological devices. Both aforementioned participants stated that students grew up in a generation where technological devices are embedded in their daily lives. In addition, it is evident that Soñadora and Nicoyana made a clear distinction between the past and the

present, and that it is necessary that they know how to handle the technological

advances. In this case, if teenagers are using their mobile phones or any other

technological device constantly, the role of teaching and learning should be

adjusted to the current generational trends.

Furthermore, Herediana described students' mobile devices "is a new

fad." This aligns with the previous comments, where Soñadora and Nicoyana

expressed that "it is what teenagers are using now" and "they handle it better

than us." Herediana expressed this:

> Yes, because I think it's on trend. For them it is a new fad, or perhaps it
>
> is part of their routine/customs, it is part of what they have grown up
>
> with. For adults it is something new.

These three participants agreed that the mobile devices are a trend for

teenagers and that it is something new that adults may not handle as well as

students in this generation. Rosa also expressed, "I am not a technology lover,

but I like to use it, because I know that the children like it that is the new trend

or fashion." Rosa is saying that even though she does not like technology, she

thinks it is a trend that students are using. This finding also aligned with the

previous teachers. However, for other participants, technology is not seen so

beneficial. Minnie said that technology should not be used in "excess." She

expressed that "technology is a resource that can be used but not in excess, if I

don't know how to use it."

Knowing how to use technology is crucial to incorporate it in the

teaching practice successfully. If there is not a knowledge base that supports

the implementation of methodologies integrating mobile devices, it could be detrimental for the teaching and learning process. For instance, since students are in the habit of using mobile devices, preventing them from incorporating them in the classrooms might isolate them from what they are interested in. To this, Minnie expressed:

> I think technology is helpful, but it is not everything. It is a part of the learning process, it is a tool that you have to know how to use, because if I tell them, "Students, take out the phones and look for such information," I cannot control if they are really looking for the information. So it is a double-edged sword.

The participants' mixed perceptions of their experiences about the use of mobile devices were evident throughout the interviews. Participants were against and in favor of using mobile devices in the classrooms. Based on these mixed findings, I ascertained positive and negative perceptions about the use of mobile devices that I analyzed as follows. Participants expressed more of their concerns when students used mobile devices in the classrooms; therefore, I described the negative perceptions first.

Teachers' negative perceptions about the use of mobile devices in the classrooms. The participants were concerned about the use of mobile devices (such as mobile phones) by their students. The consistent trends participants' expressed across the interviews were distractions by the use of mobile devices, and lack of self-control when using mobile phones by young students. Participants voiced their concerns repetitively, but along with the

negative perceptions, they also saw benefits of using mobile technologies in their teaching practice.

Distraction. Participants stated that students are easily distracted when using the mobile device in the classrooms. The majority of participants perceived students are off-task when using the mobile device. Minnie reported this:

> Well, let's say that sometimes they are texting on WhatsApp. They get distracted more easily because they have the phone in class, then if they get a message, they can quickly respond or play a song. If they have internet they get easily distracted and it is more difficult to control what they are doing.

Minnie stated that students deviate their attention from their tasks when using the mobile device. If students have access to Internet, they use their mobile devices to send texts or play games. Primorosa concurred with Minnie's perspective about the use of mobile devices in the classrooms that could be a distracting factor. Primorosa expressed that, "They [students] use the phones only for games, and to interact with each other on social media. This is distracting when it comes to their learning process." Additionally, Sol-Naciente added, "in a normal class they are not allowed to use the telephone, they cannot take it out, because you know there is everything on the phone and there are some students who can deviate their attention from the content and check social networks or Facebook."

Most of the teachers also indicated that the use of mobile devices to a certain extent is a distracting factor. To get a wider perspective about this trend, I input the word *distraction* in NVivo12 to determine what teachers expressed about this specific word (see Figure 7).
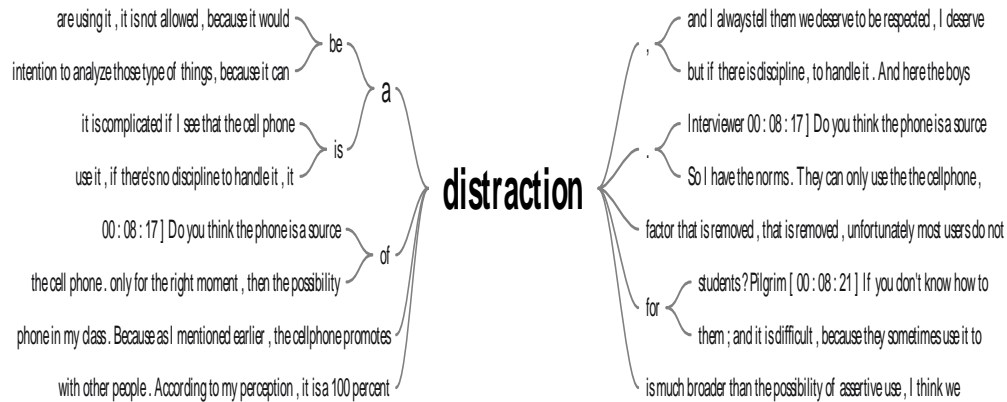

Figure 7. This image represents what the participants mentioned regarding the word distraction when the students used the mobile device in the classrooms. The image was captured from the NVivo12 software.

Profe-Moreno perceived the use of mobile devices by students in the classroom is a "100% distraction." And he continued adding that he let students use the mobile device in the classroom only by his supervision. Profe-Moreno was cognizant that students might not be able to use the mobile device only for educational purposes, because they can deviate their attention to something that not related to the subject he is teaching. Thus, based on his perception about the use of the mobile device by the students, he prefers to limit the use in his classes (see Figure 8).
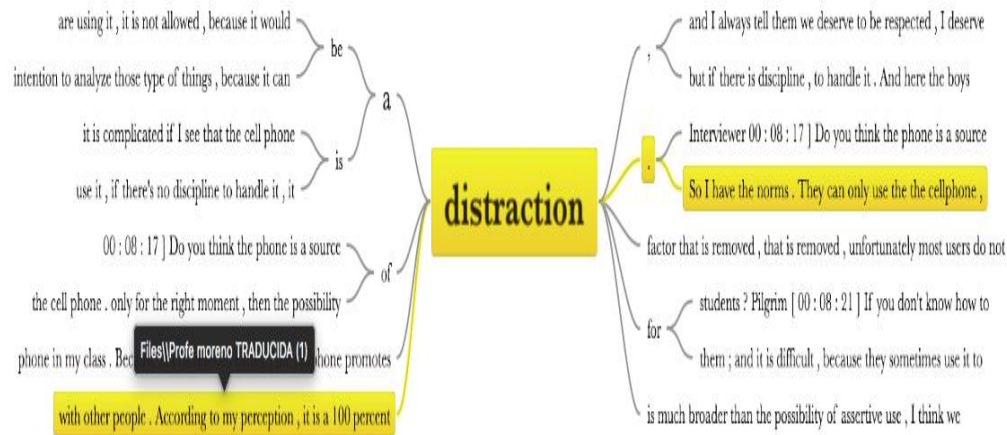
Figure 8. Distraction from the word-tree expressed by Profe-Moreno. His perceptionon about the use of the mobile device, in this case, the cell phone by his students is a total distraction. This image was captured from NVivo12 software.

Peregrino-Gris's concurred with Profe-Moreno's perceptions about the need to establish clear guidance to avoid distraction within students. In addition, Peregrino-Gris expressed some frustration about the use of mobile devices by students, since they do not have the "culture" to moderately use the mobile device. In the excerpt below, some of the frustration he expressed is evident:

> They are also not allowed in everyday use for children because they can distract in a class, if I ask students to bring the phone, it would have to be under certain conditions, but there is still not enough regulation for the use of the phones, if some kids have any questions, I tell them if you have a cell phone you can consult the problem that we discuss. And you know what they use it, but then they get to a different site and get distracted by other information. And in the end the resource is wasted,

the time is wasted. I also believe that there is not a culture to use the cell phone in the class.

Peregrino-Gris emphasized that the use of the mobile device is a "waste" of time or a "waste" of the resource if there is not a "culture to use the cell phone in class." This participant ascertained that students need to be educated to use the mobile device in class; students should be cognizant when using the mobile device, they should respect teachers' norms to succesfully develop the in-class activities. Thus, Peregrino-Gris mentioned "education" is crucial to control the use of the mobile devices in the classrooms by students and teachers. An example that mirrored what Peregrino-Gris previously expressed is stated by Rosa when she dealt with the students and mobile devices in the classrooms:

They [students] are asked: "Students please turn off the phones, because I'm going to start a new topic, and I need to give an explanation." There are some who turn them off, but there are others who don't. I'm not going ask them one by one: "show me, show me your phone." When will I finish? I would spend time. Then, …I ask them: "guys please let's concentrate on this, let's do this. I don't need interruptions" and the first thing I am going to request is that they turn off the cell phones or put it on silent mode…But …there are some who do it, and some others who do not it.

In this excerpt, Rosa seemed frustrated about spending her time to check if students turned the mobile device off. This is a challenge that some teachers, like Rosa, may find on a daily basis. Another aspect that Rosa mentioned in the

excerpt is that she needs to ask students to engage in the different activities.

This reflects that students may not be interested in the subject, because they are

using their mobile devices. Additionally, there did not seem to be a strong

regulation that prohibits the use of the mobile device in the classroom, and if

there is one norm that restricts the use of the mobile device, students may not

respect it accordingly.

   Negotiating the use of mobile devices in the classrooms. When

participants were asked what they knew about mobile devices in the classrooms

and how they employed them within their teaching practices, most of them

expressed they had to set the limits and negotiate with the students before using

the mobile devices in any class activity. Therefore, it is necessary to establish

their own norms to use the mobile device in classrooms, since students bring

them into the class on a daily basis. I created a bar graph highlighting the the

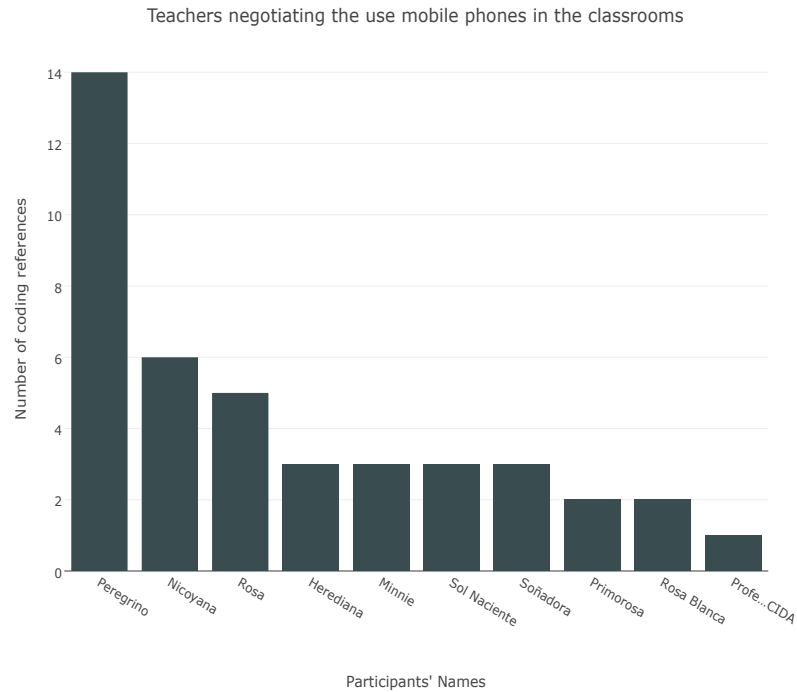participants negotiation of the use of mobile classrooms by teachers (see Figure

9).

Teachers negotiating the use mobile phones in the classrooms

Figure 9. This bar graph represents the number of times participants metioned how they negotiated the use of the mobile devices in the classrooms. Almost all of the particpants mentioned more than once that they negotiated the use of the mobile device in the class. I obtained this bar graph from NVivo12 software based on the code "Teachers negotiating the use of mobile devices in the classrooms."

Based on students' responses, the participants in this study indicated that they have decided when it is convenient to use the mobile device during their teaching practice. For instance, some of the participants negotiating with their students when and how to use the mobile device is useful in order to avoid any distraction or deviation from the task. Sol-Naciente expressed this:

I allow them to use the cell phone when there is something related to the subject matter. When they are watching a video or when they are looking up for words in the dictionary or when they are doing an investigation. Once they already found what they were looking for, then I tell them to put their phones away, because they should be paying

attention to the explanation. Or if I am making the presentation at Power Point, all phones should be stored, because they have to be paying attention to the explanation; then it is negotiable, you negotiate. You have to adapt; you negotiate with a student. Well right now we are not going to use phones because you have to pay attention to the explanation. Later yes [you can use the cell phone].

In this comment, Sol-Naciente emphasized that students need to "pay attention to the explanation," and she will give the students and the "negotiation" ability. This implied that if students use their mobile device for certain activities, they may deviate their attention from the in-class explanation. However, if students know in advance what the conditions are for using their mobile device, it would be advantageous to use the mobile device effectively. Additionally, Sol-Naciente continued explaining that teachers "have to adapt." In this case, she was aware that students would be using their mobile devices and it is necessary to adapt to this situation.

Another example of how the participants negotiate the use of mobile devices in the classroom was described by Rosa:

I know they will finish their assignments fast and the rest of the minutes, they will use it [mobile device] for their leisure time, what matters to me is that they worked, I covered what I wanted to cover in the class. That also depends on the teacher's attitude, because if they [students] finish they say, "can I use the phone?" because they already know that I do not

like it. If there is time left, I can give some time. They will be able to use it.

In this comment, Rosa mentioned that it was important for her the students to finish their work in class, but she is also aware that Rosa was aware that students are driven to use their mobile devices frequently. She also mentioned she did not like students to use their mobile devices in class; however, she also stated that it also "depends on the teacher's attitude." Even though Rosa does not like her students to use the mobile device in class, she gives them time to use it after they finish the in-class work.

If there are not well-established guidelines for using the mobile device in the classroom and if students are not aware of these guidelines, teachers are not likely to control what students do with their mobile devices. Profe-Moreno preferred the use of mobile device only used under his supervision: "They use the cell phone only under my authorization. It doesn't mean they are forbidden to bring the phone to the class." He also said that he controls the dynamics of the class when using the mobile devices when he teaches his lessons. Profe-Moreno added, "So, I have my norms. They can only use the cell phone, when the teacher requests it." To this Herediana further expressed:

Students are given a certain time to use their cell phone, because it is difficult to control them. I walk around and supervise what they are doing, but the time is limited. Some students who are working on something, they are using a cell phone to search for such a thing, such a word, such a phrase.

Herediana lets students to use their mobile device with limited time. In this way, students can be controlled. She also constantly monitors what her students do while students use the mobile device. Sol-Naciente also stated that she used mobile devices in the classrooms, but she needs to monitor her students constantly: "So I feel that yes, it [mobile device] can be used as long as you are vigilant and when you are able to say okay; today, yes [you can use it], or today, not." Rosa also limits the time for the students to use their mobile devices. She expressed this:

> I actually have a schedule for the lesson…And then, I have them to work with the cell phone, but I set the time limit, because they can do something else with it. I try to limit them from using it [the cell phone] yes, because they like it.

Peregrino-Gris expressed similar thoughts as the other participants who deal with mobile devices in the classrooms. He knew that not all of the students have a smartphone, so when he had students look for different concepts with the help of a mobile device, he set the limits in the class to use the mobile device or smart phone. For Peregrino-Gris setting the limits and having the students respect them is crucial for developing a class succesfully: "if we have established limits [to use the mobile device] it is great, but if there is an absence of limits, when there is an absence of limits, I think it is not appropriate [to use the mobile device]."

Lack of self-control when using mobile devices. According to my participants' experiences and perspectives, younger students are less likely to stay on task when using their mobile devices, because they distract easily; therefore, teachers have to become stricter with the students. On the other hand, more mature students, the ones who are in higher levels, are more likely to use their mobile devices for educational purposes and follow guidelines accordingly. Some participants acknowledged that using the mobile devices with seventh or eighth levels is more difficult because of the students' lack of maturity. Rosa-Blanca said "I have always seen that fourth and fifth graders use their phones to do their assignments, but seventh and ninth graders do not do the assignments." Additionally, Nicoyana, Soñadora and Sol-Naciente also perceived that students in low levels are less mature when using the mobile device in the classroom. Nicoyana added:

> I don't have tenth graders, but I think they have more control to use the cell phone. I suppose that it is maturity. They are used to be told to use the phone correctly. "please stop using the phone" there comes a time when [the students] realize [they] need to use the phone appropriately. I believe.

Sol-Naciente also said this:

> There are always very very mature people [students], who know that they have to use the phone to study or as a working tool, but there are some who do not, they use it [the mobile device] to be sending jokes or to be taking pictures of their classmates and then making a meme.

The participants in this study perceived that younger students are less likely to control themselves when using the mobile device in class, because they deviate from the task. Some participants, like Profe-Moreno, restrict students in their use of mobile devices in the class, unless it is an emergency or a call from their parents. Rosa-Blanca says that lower level students do not know how to use the phone appropriately, which may hinder their academic performance. For instance, Rosa-Blanca stated

> Fourth and fifth levels don't, because they bring the presentations on the phone and everything. With seventh and eighth levels this changes, because they take a picture of the content and at the time of the exam .... they say they deleted the information or it is missed. That is because, they are not mature. They do not use the phone correctly.

And Rosa-Blanca continued by adding that students do not follow the guidelines:

> The problem is that the students take out the phone whenever they feel like it. My daily fight with the students is that, when a group enters to the classroom, I tell them "sit down and put your cell phones away…Basically, you have to fight with them [the students] the entire lesson. To put the phone away, but [when] you tell them that they need to look for something on the web, they say that they don't have data"

> Rosa-Blanca teaches eight grade students and she sees that the use of mobile devices for lower-level students is problematic. She even described this is as a "daily fight" with her students. Whenever she asks them to use the

mobile device to do an educational activity, the students stated that they do not have data to do so. Additionally, Rosa-Blanca expressed that students have an entitlement to use their mobile devices whenever "they feel like it." This perception echoed Peregrino-Gris when he mentioned students do not have a "culture" to use the mobile device appropriately. If students regulate their use of the mobile devices in class, this situation would be different. On the other hand, if students followed teachers' authority regarding the use of the mobile devices in the classrooms, teachers would not be dealing with this situation. The perception that students who are in seventh, eighth, or ninth grade are less mature to use the mobile device is generalized across the teachers. They seemed reluctant to use the mobile devices and if they use the mobile device, they should have it reflected in their lesson plans. For instance, Primorosa expressed this :

> If I don't have it written in the lesson plan or within the activities of the
> classroom, you should not be using the phone in class. We have
> permission to use the phone as as a learning tool, but if it is not within
> the activities of the classroom and the students are using it, it is not
> allowed.

Otherwise, the institution forbids the use of mobile devices in the class. Soñadora expressed that "The institution's policy forbids the use of cell phones. They say that cell phones are not allowed [to use] in class." Luna Blanca High School forbids the use of the mobile device for a situation that will be explained later.

Addiction to mobile devices. Participants also pereceived students constant use of their mobile devices delves into or triggers addiction. For instance, Sol-Naciente mentioned the word "nomophobia" to illustrate how students felt about their mobile devices if they do not have it close to them. Nomophobia is known as the fear of being withouth access to a working cell phone (Bhattacharya, Bashar, Srivastava, & Singh, 2019). She indicated that she talked to her students about two important topics: the dependency they had on their mobile devices and the importance of self-regulating the use of their mobile devices. Sol-Nacientes said the following:

> I talk to them about nomophobia and the students tell me " the bus can take off, but if I have to return [home] to get the phone, I do it. I cannot be without my phone." So, they are already dependent on their phones.

Sol-Naciente described the use of the mobile device by her students as an "extension of their bodies," since students have to have their phones constantly. Sol-Naciente also compared the cell phone as an "electronic pacifier" for the students. Thus, Sol-Naciente continued describing how she handled this situation with her students:

> I tell them that they have to be very careful…I tell them "you have to be smart, you have to use the phone as a tool, where the phone doesn't dominate you and may not guide you for bad things." They have to use it to take advantage of it, but they use it and exactly use it for bad things too.

Sol-Naciente was aware students can employ their mobile device for their own benefit, since this technological gadget may be a powerful tool for their learning process; but she also believed students use it detrimentally. Sol-Naciente implied in this excerpt that mobile devices are manipulating or controlling students' behaviors. She exhorted students to not be controlled by their mobile devices; instead, they should be "smart" to use the mobile device.

 In addition, Nicoyana's experience also reflected the addiction students had to their mobile devices and how this situation can lead to the isolation of the students:

> I had one student in BlueMountain last year; he was in eighth grade , he had non-significant curricula adaption, he was very intelligent, but he had a very serious problem; he was the nephew of the professor of mathematics who was the academic coordinator, and I told him : " your nephew is very intelligent , but he has a very serious problem." And he asked me "what happened?" And I said "he [the student] sits on this side of the classroom and he does not relate to anyone." And I asked him "Why would this be?" He told me "my nephew has a serious problem, he has a play station, he has many technological devices and he has a telephone and everything in the bedroom, so he doesn't come out of those four walls. When he has no classes, he just goes there. He has no friends and he doesn't even go to the grocery store. He barely leaves the room, he just goes out of the room to take a shower. And it happens during the entire day and I don't know how late he stays up at night, with

all those technological devices." And then I told him "You have to see how he controls himself from using these devices, because it is not possible that a person does not socialize." And he isolated himself in the classroom…I would tell him "come here" and he would say "no teacher, I'm going to work alone. It's just that I do everything by myself" since he is very intelligent.

Both Nicoyana and this student's uncle, the mathematics professor, were aware the student had a "serious problem" with the attention and time he devoted to his mobile devices. The student reflected the same behavior at school and at home; in this case, he isolated himself from others and did not talk to his classmates. The student's uncle said that his nephew did not have any friends and he "barely left the bedroom." Nicoyana was concerned about the students' interaction with the rest of the class; for this Nicoyana, socializing seemed important, but it also seemed the student prefered to be by himself and work alone. Nicoyana perceived the use of mobile devices as technological tools that "isolated" the student from the rest of the class. In this case, the form of communication for this student is more a virtual communication rather than a physical communication.

As I continued asking the participants if they perceived the use of mobile devices as addictive for students, many of them agreed the students were fixated on their mobile phones. For instance, Herediana said this:

Addiction yes! but it's already involuntary, they are looking at their phones all day. In other words, I assure you they are not even checking

the time, they only have to feel that the phone is there or that they have

to see something on their phones.

Herediana perceived that students use their mobile devices without

thinking about it. They have to be touching their mobile devices or seeing

something. This comment also paralleled with Sol-Naciente's "nomophobia's"

term she previously described. Along to this, Sol-Naciente mentioned that

students did not wear their watches to check the time; they wore them as an

ornament. Peregrino-Gris also said students are in constant need of using their

mobile devices to be on social media. He expressed "the students are dependent

to their mobile devices. When I say "dependent," I meant "addicted," that

constant need of being chatting in WhatsApp or Facebook; they do a lot of

things that are irrelevant for their studies."

Along with the students' addiction to use their mobile devices, the

students' mobile device ownership was a usual trend the participants expressed

within the interviews. Generally, all of the teachers indicated that most of the

students had a mobile device. Primorosa said "Well I would say a 99.9 %. All

of them have a phone, even the student with the low economic resources up to

the one who has money." Primorosa believed that students' low economic level

is not a barrier to acquire a mobile device; in this case, students find their way to

get a mobile device.

When teachers were asked how it was possible for students with low

socio-economic resources to get a mobile device, most of the teachers said

students obtained them through the "scholarships" provided to the students by

the Government's institution: Instituto Mixto de Ayuda Social (IMAS). To this, Rosa-Blanca added, "Scholarships that the Government gives them should be to buy didactic material, but they go to "Gollo" or these electronic stores to get a phone. Then, they pay the monthly fee with the scholarship."

Sol-Naciente also said that students have better mobile devices than she does, and that students use their scholarships to obtain a data plan. She even vented to her students that she felt they were using the taxes she pays to the State to buy the mobile devices:

> They have a scholarship, but IMAS doesn't ask them on what they spend the money of the scholarship…There is no control…on what they spend the scholarship. They (IMAS) only give it to them and they (IMAS) only ask if the student is enrolled at school. They do not care, if they spend all day outside on the bench as it is happening with many students, who sit and do not enter class. That's where I get upset and it makes me very angry and I tell the students ...., the public workers are maintaining you, because you don't work. Those are my taxes, you are stealing my money, I tell them. I tell them you are taking advantage…but they don't see that…but the vast majority…live off of the State welfare.

Privacy violations. The participants also expressed their concerns about privacy issues. Some of the participants mentioned that the students at Luna Blanca High School created a Facebook page, where they uploaded memes based on different situations that took place in Luna Blanca High School. These

memes were not authorized to be published by the teachers, making some of them upset. Rosa described this situation as follows:

> There is a boy who graduated from school last year and created a Facebook profile using memes, and this is damaging everybody, because if they know something, they upload the information. And they make memes about everyone. The principal is even there. She appeared there in a few memes, the guardian, teachers and students. There is an investigation, because there are some people affected by these memes.

Soñadora further explained how she felt about this situation and how disrespectful this was for some of the teachers in Luna Blanca High School. Soñadora described this:

> Well [the memes] they were about the guardian and the same principal of the school. It was a little uncomfortable, because I personally, I saw it as disrespectful, because they [students] did not ask for permission. If they asked for permission and the other person totally agreed, it would have been fine, because there is nothing to object against that, but it was without the authorization of the use of the image of the person.

Soñadora indicated that students did not ask for permission when creating the memes of the principal and the guardian of the school. Soñadora continued describing how some teachers felt about the Facebook profile containing memes about them. Teachers were "uncomfortable" and "angry;" some other teachers were "indifferent" and "did not pay attention to this situation." Soñadora stated "the use of the cell phone is restricted, almost

forbidden… by the institution's policy, but this is due to the Facebook page containing the memes. This is a way to protect the teachers and the students themselves." From this excerpt, it can be inferred Luna Blanca High School's principal forbade the use of mobile devices in the classrooms, unless it is reflected in the lesson plan. This measure was adopted to avoid any harm against teachers and students.

Rosa-Blanca also described an experience she had with students creating memes; however, she thought this is normal. She said students are "light years ahead of us," and teachers should not be "scandalized" by these situations. Rosa-Blanca stated, "They take pictures and make memes…we cannot limit them… they take pictures of certain teachers and create a meme. Then, there are some colleagues; there are some who were scandalized." Rosa-Blanca implied that students cannot be controlled or limited from creating these memes. The privacy of the teachers is being violated by the memes students are creating without their consent.

When asked Sol-Naciente about her perceptions regarding students making memes, she said that her students have made memes about her, but her students "love" her and they do not use Sol-Naciente's image. Sol-Naciente described this situation as follows:

> I don't have Facebook, but students have created memes about me and very good ones. I think they love me, so they don't take a picture of me. They use other images and they are very good ones…So, the meme [he creates] goes through my quality control and they tell everyone "look at

the memes I created". They do it before the exams. And I tell them "the memes look good" and I give them a hands up or I laugh. They are genius; I tell my students. Once the memes are approved, they go viral…They are really good. They only use my name, but not my face. If the memes are not offensive or damage your integrity, it doesn't bother me. Students are creative and innovative. I tell them they have to exploit it.

Sol-Naciente established a bond of trust with the students, which has allowed her to negotiate with her students the content that would appear in the memes they made about her. Students did not create a meme with her face; they only used her name, which did not seem to bother her. On the contrary, it seemed Sol-Naciente liked it when students created memes about her. To her, she felt that these memes do not harm her integrity. In addition, Sol-Naciente perceived that students are intelligent when they are creating memes. She acknowledged that students have skills and creativity that should be "exploited." In this case, Sol-Naciente seemed receptive students use their mobile devices as long as they are used appropriately.

Figure 10. This meme was provided by one of the participants who granted permission to use it. The meme's content is about the students feelings before taking the participant's test. The meme's desription and translation into Spanish is the following: Thanos is the antagonist of Avengers: Endgame movie (2019) on the top. Iron Man is one of the superheroes that appears in the same movie. Thanos says to Iron Man in English; "The test was easy." By Thanos' hand, it is the word *quintos;* which means in English "fith grades." Iron Man responds to Thanos in English "God bless you, did you hear that?," and by Iron Man's hand is "She fails more than a half of the students from fifth grade."

Teachers' positive perceptions about the use of mobile devices in the classrooms. The participants also conveyed positive perceptions regarding the use of mobile devices in the classrooms. Most of the participants stated that when using mobile devices appropriately, they can be beneficial for the teaching and learning practice. The sub-themes related to the participants' perceptions included (a) students' engagement and motivation and (b) facilitation of the teaching and learning process. See Figure 11 that represents the times teachers mentioned they used mobile devices in the classrooms
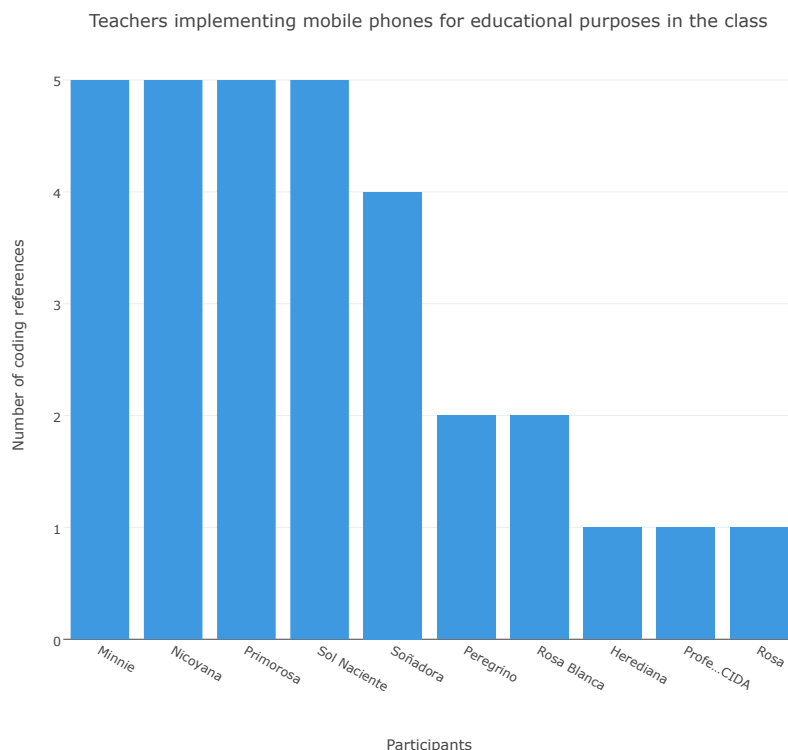
Teachers implementing mobile phones for educational purposes in the class

Figure 11. Bar graph representing the times participants' expressed they used mobile devices in the classrooms. This bar graph was obtained from NVivo12 software based on the code "Teachers implementing mobile phones for educational purposes in the class." As the bar graph represents, all of the participants used mobile devices for their teaching practices.

Students' engagement and motivation. "*It makes it a little easier; it makes the class a little more enjoyable.*"--Primorosa. Most of the participants agreed that the use of mobile devices in the teaching and learning process engages and motivates students during educational activities. Participants perceived that mobile devices are part of the students' lives and that they are attached to their mobile devices; therefore, they believed that it is important to incorporate their use in developing their classrooms' activities. Minnie stated the following: "It is interactive for students, because it is what they use today. They use the headphones and the cell phone the entire day to watch videos."

Teachers are aware that students are using their mobile devices constantly and that it may be advantageous to incorporate it in their classes, because it entices and engages students in the teaching and learning process. Nicoyana described this:

The use of mobile technologies for learning in the classroom is very important. Why? Because it is the technological era that it is the era of the young. It is for this century. It is not the same as when I studied, a long time ago. The students were born in this era. And that entices them. Everything that is technological, the telephone, the computer, and the head projector etc. And I think that it is easier to learn with technology, than with the traditional classes as I learned.

Participants were cognizant of the use of mobile devices as "important" and they emphazized this through the interviews, that their students were born in a different era. Nicoyana added that the value technology has, not only to entice students to the learning process, but also to learn in an easier manner. Additionally, Nicoyana added that we are living in a modern world where "everything is technological," and that students "master technology quite well. They were already born with that chip;" thus, it is important to incorporate technology and to change the traditional educational practices.

Profe-Moreno expressed his interest and penchant towards the use of mobile devices in planning his classes. He described the methods and activities he has used in class with the help of mobile devices he has acquired on his own. For instance, he stated, "The advantage I have is that I have always had my own

technological resources. So, I like technology too. I do like to be a little informed." Profe-Moreno also said that his students are interested because of his teaching methodologies that incorporate technology. Profe-Moreno described this:

> I use technology, even if it is for very basic activities. The students tell me "profe you are lazy" and I ask them, "why do you tell me that?", they say: "Because you do everything with the computer and the computer." And I respond to them, "it is not that I am lazy, but that I consider myself a fairly modern teacher " and I am one of the teachers I rarely write on the board. I am not writing on the blackboard, the only thing I write to them on blackboard are the new guidelines of the Ministry of Education.

Profe-Moreno seemed receptive to the use of mobile devices in his classes, but he did not let his students use their mobile devices if they were not allowed to do so. However, Profe-Moreno was cognizant that students like technology and that it is beneficial for their learning. He also perceived himself as a "fairly modern teacher," where he did not write on the blackboard, which he considered a traditional teaching practice. Based on this, it can be inferred Profe-Moreno made a comparison with other teachers who may continue using the blackboard to teach. An interesting aspect from the previous excerpt is that Profe-Moreno's students called him "lazy," because he barely used the blackboard to provide the content for his students. Instead, Profe-Moreno used the computer to teach his classes. It can be assumed from these quotes that

Profe-Moreno felt that students perceived that a teacher who writes on the blackboard is working hard, and that using mobile devices and technology to teach means less hard work. It can be inferred that there are certain assumptions about using technology; for instance, using technology to teach may mean teachers are lazy and do not work as hard as they should, which is a traditionalist view of the teaching-learning process.

Profe-Moreno kept describing the way he uses mobile devices and technology in the classroom:

> Yes. I don't have it here now, it is very delicate, so I bring it only when I go to work. That is a device that connects to the head projector and turns the board into a digital board. There are two pens, the one I have and the one that the student uses. I explain and project a blank map. The blank map allows the boy to participate using the pen. They can make their own graphs, according to what we are covering in class.

This excerpt exhibits how Profe-Moreno used mobile devices and technology in an institution that has limited resources. Profe-Moreno seemed interested in the students' learning process, because he acquired the technological equipment to make his classes more interesting and engaging for students.

For Herediana, being open-minded is critical for teaching students who are using their mobile devices constantly. Herediana expressed this: "Be open minded. In this sense, because one has to adapt. I don't like games for example, but sometimes students do. They make comments like that. So, I also ask them:

"what do you like?" Adapting to mobile devices was a common pattern among

participants. The participants in the study asserted that adapting to new

technologies and mobile devices was necessary to engage students in the

classrooms, especially regarding the use of the mobile device in the class.

Herediana asked students what they liked, since knowing students' interests is

fundamental to tailor teaching practices to have students become successful

learners.

Herediana also mentioned students like games; whereas, she might not

like to use them in her teaching practice. Most of the participants said that

students get distracted by being on social media, texting, or playing with their

mobile devices. In this fashion, Herediana was aware that games could be

beneficial to learning. Herediana described an experience she had when she

used different tablets with the program ABC Mouse at a different institution.

The students had tablets provided by a private company and the experience she

had with the students was positive. When I asked if the students liked the

program Herediana responded, "Of course! Because the students loved it, they

said that in English class what we did was playing." Soñadora also shared a

positive experience she had with her students using mobile devices in her

lesson:

> The idea is to do different things than simply showing a text on a big
>
> screen. Today I laughed a lot with a group of fifth grades, because they
>
> had to do an interview, but they were so smart that they came up with
>
> the recording first. And after that recording, they were listening to it

because, they were recording it with good pronunciation, they did it in a good environment, then they were listening the recording using their headphones. They were repeating it. Then, I changed the roles of the partners, and they said I tricked them. But what they did ahead of time helped them, because they were no longer afraid; they felt more confident.

Soñadora asked the students to record themselves using their mobile devices. Then, she asked them to practice the interview in English in pairs. The students had the opportunity to practice ahead of time, which was helpful to develop the in-class activity successfully. Soñadora mentioned she was laughing, which often is seen as a reflection of enjoyment. She continued describing the activity, and she mentioned the students "liked it a lot." This activity was developed using students' mobile devices, where they had to interact and practice English as a foreign language.

Using the mobile devices helped students became more confident to interact with the other students, since they practiced their pronunciation through listening to themselves. A noteworthy aspect Soñadora mentioned was that only projecting content on a big screen is not enough; it can be inferred that it is necessary to innovate and provide other activities that entice students and help them learn and engage in the learning process meaningfully. It also seemed that Soñadora was receptive to students using their mobile devices in class. She mentioned, "Yes, and we were having fun. They honestly didn't see it so boring." She also perceived using mobile devices as "positive" for her teaching

practice: "I see it [mobile device] positive. They practice what they are listening and review phonics. Also, when they have questions about any word. I really love the online dictionary that is word reference." In this sense, the use of mobile devices is beneficial for engaging students in the learning process and having students learn in a non-traditional manner.

Nicoyana also indicated that using mobile devices can help to have a more creative and innovative class. Nicoyana described this:

It is as a different way they [students] can learn, because it is creative and innovative, and it is not boring, they do not get bored. For instance, giving them lectures, photocopies, explanations, worksheets with exercises or having them write from the board is boring for them. What's more, they don't even pay attention.

In this excerpt, Nicoyana said that traditional teaching practices such as lectures, worksheets, or writing from the board are boring for the students. She also mentioned that students might not be interested in these kinds of activities, since they may not be appealing to their current interests. As mentioned earlier, participants were aware that students from this generation are interested in the use of mobile devices for different activities; therefore, they have also mentioned it is necessary to incorporate mobile devices in their teaching practice. Sol-Naciente complemented the previous reasoning with the following comment:

That is what they [students] are using right now. Yes, that is what drive their motivation, you have to take advantage of that. Why are you going

to swim against the current? Like limiting them [students] to use their phones. It cannot be possible, because, then there they are going to rebel against you and your subject matter. For example, sometimes they say, in a normal day they say: " teacher can I listen to music while I do the practice?" And I say: "Yes of course with your headphones." So, they are listening to music and working.

Sol-Naciente said, "Why are you going to swim against the current?" This means that teachers should not prevent students from using their mobile devices in class; otherwise, it could be less beneficial to engage the students in the learning process. Sol-Naciente also mentioned, "it cannot be possible." It can be assumed that Sol-Naciente was aware that students are attached to their mobile devices and that it is more beneficial to take advantage of the device as a learning tool, rather than banning the mobile device from the classrooms. It can also be deduced that students liked to perform different activities using their mobile devices, and enjoyed listening to music while they did an in-class activity.

The previous comment aligned with Rosa's statement about the use of mobile devices in class. Even though she was not a "technology lover," she had to incorporate activities in the classrooms that involved the mobile devices, because this is what her students preferred. In other words, teachers should embrace the use of mobile devices for their teaching practice to provide a more engaging and motivating learning environment based on the students' likes and needs.

Mobile devices: A teaching tool that facilitates the teaching and learning process. *"I perceive them as something positive, but if it is properly used. If I can give it a proper use and a proper use at homes."* –Rosa-Blanca. The majority of the participants in the study concurred that mobile devices are tools that facilitated the teaching and learning process. Minnie stated that she used the mobile device for "everything." She described in the following excerpt how she uses the mobile devices:

> For everything, let's say I call the parents. I give my phone number to the parents to send messages and confirm they are coming to meetings, to send them videos through WhatsApp. You can send the parents the videos or links. For the students who have learning difficulties, I recommend videos, so I send them the videos. I take pictures of the assignments. It works as an educational systematization. It shows the process of what they [students] did during the year. Because at the end of the year you always have to give a report, what was done and what objectives were achieved and which were not.

In this quote, Minnie described how she used the mobile device for her teaching practice. First, she communicates with students' parents through WhatsApp. The mobile device can be a mean of communication that can help Minnie have a more individualized and personalized interaction with the students and parents. Also, Minnie was able to provide content to students and their parents if they needed more information related to the content they were studying. Having an effective way to communicate with parents and students

may be helpful for updating students and parents regarding academic performance.

Primorosa also thought the mobile device was a valuable tool that can support students' learning, since it facilitates the access to more information "It facilitates access to information and different content, and strengthens some of the content. I can find more information for students." Primorosa also added, "It is a tool that facilitates everything that takes control of the student; it is a tool that makes our work easier. Well, in my opinion it is a tool that could make the job much easier." This comment aligned with Minnie's regarding the use of the mobile devices to keep track of students' performance and provide a report at the end of the school year.

Additionally, Minnie mentioned that mobile devices could be beneficial for students with learning difficulties. She provided more information, such as videos, that can bridge students' learning gaps. From participants' earlier comments, it can be assumed many felt that parents and students have mobile devices that help them send and receive information, which can support the students' learning process. Primorosa added that using mobile devices makes the communication "faster," and "easier," which facilitates the learning and teaching process. Primorosa expressed the following: "I think it is more efficient when it comes to communicating with them [students], because it is easier for them to have a chat group. They get the information faster; I think it's easier, it is faster." Minnie also stated that at the end of the school year, she needs to provide a report that reflects a systematization of the activities students

performed during the school year, to indicate whether students achieved the educational objectives or not.

Minnie further explained some of the activities she uses with mobile devices to send the information to her students who do not have the ability to access the content or the information because of economic limitations:

> If they don't have the copies and if they don't have the money, I can send them the document or the photocopies through WhatsApp. Or the students can take a photo of the copies with their phones to read. It doesn't mean I ask them to read it through their phones. The students take the pictures by themselves. Or they say, "Teacher, can't you send this to me?" Then you send it by email or it is sent by WhatsApp. Then they download the document, if the students have Internet; the ones without Internet take a picture of the photocopies.

In this sense, students who have limited resources could access the content by downloading the information on their mobile devices. Also, teachers can install a chat application, where all of the students can receive the content they covered in class instantly. A noteworthy aspect is that Minnie did not have them read through their mobile devices, but the students used their mobile device to read. Rosa added that some students did not spend money on buying the material or the book they needed to read in class, since they could read it on their mobile devices; Rosa added:

> They can read it wherever they like the most. Where they find it easier for them. So they are happy, because they say, "I didn't spend the money

buying the book, and I read it whenever I want. I don't have to carry the book with me that is not light. "It is heavy," they say. So I [Rosa] say it is perfect.

The mobile devices enabled students to read a book or to get the copies of the information they cover in class. In the aforementioned excerpt, Rosa indicated that students were "happy" that they did not have to buy the photocopies or the material that had the content for the class. In this institution, most of the students are from low socioeconomic backgrounds, which will be addressed furthered in the section of lack of resources. Rosa also said students that could read it whenever they wanted to do so; in this case, since students have the information on their mobile devices; it allows them to have the flexibility for reading the content at their convenience.

Additionally, students did not have to carry a book or the copies that may be heavy. Rosa said that students having the content or the book on the mobile device was "perfect." It can be assumed that Rosa perceived the use of the mobile device to be beneficial for students reading, especially in a context where there are limited resources.

Nicoyana also found that students liked reading through their mobile devices, and were less likely using their content books. She said. "No, they don't like it very much. But they read on their phone. That is very curious." Nicoyana seemed intrigued that students liked reading through their mobile devices. However, some of the reasons why students may like reading through their mobile devices include convenience for accessing extensive amount of

information without carrying heavy books, ease of downloading information on the spot, and a cheaper way to obtain the content that is being addressed in class. Many of the students come from low-socioeconomic settings, and they have limitations in buying content books or didactic materials. Thus, the use of the mobile device can be an ally for teachers and students to get the information they need for the class.

Profe-Moreno favorably agreed that mobile devices are beneficial for the teaching and learning process. He said, "It is essential, super essential. Technology will facilitate the teaching-learning process. It makes the class more dynamic. This allows the user to go further. Students don't stay only with the teacher's knowledge, but they have the possibility to investigate." Profe-Moreno, as other teachers, believed technology is beneficial for obtaining knowledge and making their classes more dynamic. Profe-Moreno was aware that technology could help students go beyond what it is presented to them in class. It may instill within students the desire to investigate further. For instance, Minnie had students work on different projects such as the creation of videos, making power points, or downloading applications that may be beneficial for learning the content covered in class. Minnie described this as follows:

> Maybe half of the students in class know how to make videos. They
> download applications, upload images and make a presentation. That is
> an option they have in civic education. They can do the project on a

computer or record a video, and present it. In social studies they can also do homework and make presentations; they can make a Power Point.

The participants in the study often gave students the option to use mobile devices to present their homework. Minnie said that using technology helped her maximize her time to give the instruction: "You don't have to be writing, you don't waste time." Nicoyana also said that her instruction is more innovative; she expressed the following: "I feel satisfied, because I feel I am making a more creative plan. Much more creative." As Nicoyana, Minnie, and Profe-Moreno, the rest of the participants seemed receptive to the use of mobile devices and technology in the classrooms. This has facilitated the teaching-learning process and made the class more innovative; which is part of the curriculum's demands.

Theme 2: Teachers' Perceived Challenges to Successfully Incorporate Mobile Devices in the Classrooms

The themes that emerged from the data analysis tapped into what participants perceived as obstacles or challenges that prevented them to successfully incorporate mobile devices in the classrooms. In this study, the participants' responses addressed the importance of having mobile devices in the classrooms and more support from stakeholders to get more professional development to develop the digital skills to incorporate mobile devices in the classrooms.

Lack of Resources

Lack of internet access. *"There isn't internet connection."* ~Rosa. Most of the participants agreed that the lack of resources was one of the main reasons why students were not able to use their mobile devices to complete in-class activities. The participants concurred the majority of the students owned a mobile device; many of the participants claimed in the interview that 99.9% of the students had a mobile device better than theirs. Likewise, all of the participants agreed that the institution did not have Internet access for the students and teachers, which impeded the students and teachers get access to the digital tools that are on the web (see Figure 12).
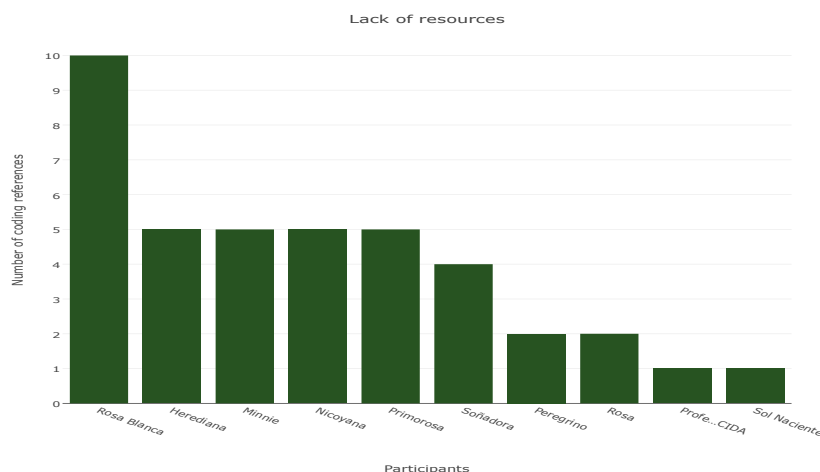
Figure 12. Bar graph representing lack of resources code expressed by participants. This bar graph was obtained from NVivo12 software from the "Lack of resources" code. All of the participants mentioned that there is a lack of resources in the Luna Blanca High School. This code was one of the highest refereed by the participants.

Because of the limitation of Internet access, the participants indicated that they negotiate with students about when they should bring their mobile devices with data to do an activity. For instance, Primorosa and Nicoyana asked

their students in advance to bring data, so they could work using their mobile

devices. Primorosa expressed:

> That depends on the availability of the resource to students. For
>
> example, if we are going to use the telephone, I tell them in advance,
>
> because they manage their Internet data plan and this limits its use in the
>
> classrooms, because if the students say they don't have data, then that is
>
> a limitation for us as teachers. The institution does not have Internet
>
> either for the students or for the teachers. That is also another limitation.

However, telling in advance when they would be using their mobile

device in class did not guarantee they would use it for that purpose. In this case,

some students preferred to use their mobile device's data for their personal

interests. Being aware of this situation, some participants, such as Soñadora and

Herediana, preferred sharing their own data with their students, so they could

use their mobile devices in class. Soñadora was paying for this out of her own

salary, a monthly plan that was intended for use with her students in class. She

expressed:

> For example, in this school, how do you connect online with your
>
> students? I do it with my own resources. What I do is to pay for an
>
> Internet SIM card, which is like 17,000 colones (30 dollars) per month,
>
> to be able to use it in the classroom, because at school I don't have
>
> Internet.

Some other participants as Peregrino-Gris preferred to use the mobile

device spontaneously, since he said he "cannot count on 100 percent" with this

tool, because students did not have data or if they did, some did not want to use it for educational purposes. Profe-Moreno confirmed that teachers have been misled regarding the access to the Internet in Luna Blanca High School. Profe-Moreno was describing a "broadband" router for the institution to have Internet, but it is not accessible to teachers. Profe-Moreno said:

> It is supposed to be broadband Internet, so the entire structure has internet. We have been deceived because they tell us that they [the telecommunication company] have not come to codify the modem and they lied to us, because I realized that they did, that at the end of the hallway there is a box, like a router.

The administrators from Luna Blanca High School have not set up the Internet for the entire institution, which is a situation that most of the participants described during the interviews. Profe-Moreno expressed the main reason the administrators did not provide Internet: "They do not give us Internet, because what they say is that the Internet slows down for the administrators at their office."

Even though Profe-Moreno mentioned that there is an installation to have fast Internet at Luna Blanca High School, there are restrictions for the teachers and students to use it. Profe-Moreno exhibited a certain amount of frustration when describing this situation, since he is a professor who likes to innovate in his teaching practice using technology. Profe-Moreno described these actions as "selfishness," due to administrators' reluctance to share Internet with teachers. Based on his words, it can be assumed that he felt powerless,

since there was nothing he could do to solve this problem. When I asked what

he felt about that situation, he described it as followed:

> Then, I said that is bad, because I was super happy to have Internet. I
>
> was going to ask for some help to Colipro or a technology training
>
> regarding technological applications to work in the class. So, I don't
>
> know, I feel that if that is the case, it is like selfishness. But we can't do
>
> anything.

> ***Lack of technological equipment.*** Rosa-Blanca stated that there was

some budget for each subject's department to buy mobile devices or other

resources, but it was not available for teachers. She expressed, "There is a lack

of resources and as much as I have asked, what they always tell us is that there

is no budget." The lack of budget for teachers to buy equipment and didactical

resources is a constant need across participants. Based on this statement, Rosa-

Blanca seemed upset and frustrated. Her tone of voice and demeanor reflected

those feelings within her. In this fashion, Rosa-Blanca continued:

> We are the only public workers that do not receive the equipment from
>
> their boss or employer, because everyone who has a job, the employer
>
> provides the necessary equipment. We do not receive it. And they
>
> pretend we work using mobile technologies, with technological
>
> resources, but what do we do if we don't have them? We don't even
>
> have Internet access.

Rosa-Blanca was describing how the stakeholders require teachers to

implement technology in their teaching practices, but they did not provide them

with the appropriate equipment to fulfill this task. Rosa-Blanca also mentioned that teachers did not even have Internet access. The participants in the study indicated that there is Internet for administrators and for the library, but not for the teachers. Therefore, it is not open to the students either.

Rosa-Blanca also described how teachers have to be quick to get limited available resources for use in their classrooms. Teachers also have to follow different protocols to obtain a technological device, and that bothers some of teachers. Teachers who request a projector before 7:00 a.m. are the ones who can give presentations using PowerPoint. To this, Nicoyana added that Luna Blanca's population of teachers and students is large and this limits their use of technology and mobile devices in the classrooms.

> We have a large population of students. The population is very large here. I do not know if they have told you that there are 1400 students. That means that three projectors do not serve all the population of students and teachers. We have almost 75 teachers.

Primorosa also described the lack of resources in Luna Blanca High School. She mentioned that she liked technology, but limited resources were a barrier to using technology and mobile devices in her teaching practices. "I said they tried to include that in the curricula, as part of the ICT's, but if it's a bit difficult when you find that there are limitations, lack of resources and all of that."

Peregrino-Gris voiced his frustration and anger, because teachers lack resources to successfully complete their teaching activities at Luna Blanca High School. He said the following:

It bothers me, some things from the system. I think as a teacher, we have to have more educational tools. But imagine, look at the classroom I have. I have a classroom with a door made out of square metal tubes. It does not have anything that covers the visibility. The door has a chain and a lock. The lock is damaged. If I kick the door, I can open it. I don't have the security that the door can resist upon my absence. I cannot know. What's more, I have my computer and I don't even bring it, because I don't find that the classroom is safe. I can trust the students, but I prefer not to risk it.

One of the last aspects regarding the lack of resources that came up through the interviews was the limitation of access to Luna Blanca's technological classroom. Rosa-Blanca explained how teachers gave up their teachers' lunchroom to have a virtual room, where they could have virtual conferences. She said, "teachers were sold the idea," that this room was going to help them to teach their classes and receive professional development.

Nonetheless, Rosa-Blanca, as well as other participants, stated that they had barely had the opportunity to use it for their teaching practice or receive any professional development. Instead, other groups, such as people from the regional advisory board, use this room to have their meetings. Rosa-Blanca said, "Here there is a videoconference room that no one uses, to put it in that

way. For example, here the videoconference room is used by everybody, except the institution or the teachers." Profe-Moreno also added,

I've never been to that place. We only went once, because we were invited to a videoconference. I have never gone for the fact that I have my technological resources, then I do not leave my classroom. I have acquired them by my own means.

Lack of adequate infrastructure. Another barrier the participants described during the interviews was the damaged classroom's infrastructure that impeded the appropriate implementation of technology. Rosa-Blanca described classrooms that do not have the right conditions for technological resources and mobile devices. She described this situation as follows:

If you see, the classroom does not have the right conditions. Then the heat/weather for the equipment and the clarity is not good here. I have to request the data projector before seven in the morning, because if you go after 7 a.m. there are no data projectors anymore. You need to provide the sound system. We have to bring our own speakers or buy them. Because if I bring it here I need an extension cord, so I bring it from home or I buy it.

Rosa-Blanca, as well as other participants, also agreed that they need to provide their own equipment for their class. And even if they have to provide their own equipment, the classrooms did not meet the conditions for the use of mobile devices effectively. Minnie described her classroom at Luna Blanca High School as follows:

In fact, if you see here we don't have any screen. We have at least the outlets; one of them works and the others are far away and don't work. And we don't have extension cords. So, we need to buy them and they have electrical shorts. So, we have to get our own things.

Soñadora also shared a situation similar to Minnie. If Soñadora's classroom did not have all of the outlets working to plug in a mobile device, she had to move around and use her own technological resources to fulfill the task. Soñadora said: "I do it with my own resources."

Peregrino-Gris described how he felt about the lack of security and the poor classrooms' conditions of the classroom. He mentioned that he felt "bothered" by the "system," since he was aware that teachers needed more educational tools for their teaching activities. He also stated that even though he trusted his students, he did not feel totally confident about leaving anything of value in the classrooms because of the lack security. Peregrino-Gris, as other teachers, expressed his frustrations with the lack of resources and infrastructure in the classrooms of Luna Blanca High School.

Additionally, another factor that may limit the use of mobile devices and other technologies in the classroom is the weather conditions. The weather in the northern Pacific Coast of Costa Rica is warm and humid. The temperature might reach 95 degrees Fahrenheit during the transition from summer to the rainy season (from March to August), and the students' classrooms do not have air conditioning. Because of the extreme weather conditions and lack of air

conditioning, the technological equipment might not function properly or can be easily damaged.

Therefore, I considered the participant's context. Based on my previous experience and the information I found at Luna Blanca High School, I made the connections with the participants' concerns regarding mobile devices at schools through my memos. Some of the participants described how using mobile devices was limited by the lack of adequate infrastructure and resources. I related to these statements, as I too had worked in an institution similar to Luna Blanca High School.

Lack of digital skills and knolwedge to use mobile technologies. "*I know, the hard part, maybe for me, is how they [students] do it. Honestly, I feel as though the meme states: "how it feels to have a smartphone, when you're not so smart to use it."* Rosa-Blanca. The previous quote demonstrates how some of the participants felt about mobile devices; some of them indicated that they did not have the appropriate knowledge or digital skills to use the mobile device in their teaching practices. To this, Rosa also stated, "I don't use my phone, because it is very intelligent and the owner is not;" which also mirrored what Rosa-Blanca previously said. Thus, it can be implied that the some of the participants felt that they lack the skills for using mobile devices' features that they considered far above their abilities. However, participants were also aware that knowing how to implement the mobile devices' features for their teaching practice was beneficial. Minnie added, "If you know how to use the tool, it is helpful. Because if there is an overuse, e.g., if you play videos every day, it will

not be very helpful for students, because they get bored." In this example, Minnie inferred that the use of mobile devices is not only to show videos to the students; instead, teachers should use the mobile device for other innovative practices.

Primorosa comments were in line with the previous participants' comments regarding the importance of knowing how to use the mobile device. She said, "I think that the mobile phone is a good tool, if we know how to use it properly." Primorosa also implied that a teacher might have limited knowledge about how to use the mobile devices' applications or features that could improve or benefit their teaching practice. Then, when asked if she had any knowledge about how to use mobile devices Primorosa responded:

> I would not say that I feel super capable, but I have some knowledge to apply it, but I do not feel qualified in the use of technology, because I think we still need a little more of knowledge. I like it, but I can't tell you that I know how to use it, because in reality, we are always a little bit outdated regarding how to use technology.

Primorosa expressed that she felt a little behind regarding how to use technology or mobile devices in the classrooms. This feeling was generalized across most of the participants. They talked about the value of knowing how to use the mobile device, and they seemed receptive to incorporating them in their teaching practices; however, they seem somewhat hesitant to use them, since they lack of the appropriate digital skills and knowledge. Peregrino-Gris added, "It would be ideal to have expertise on how to use it in class, because we can

take advantage of it." And Sol-Naciente also said, "I think it should be used as long as teachers say they can handle it or know how to use it."

Subsequently, Primorosa talked about the importance of being trained by stakeholders to use the mobile devices. She said, "I've seen it is nice to use it, but I do not know how to do it. To apply it [the mobile device] right now would require us to get a real training to be able to apply it." Herediana also said, "Actually, I think they {MEP] should give us more training to use more tech tools to do more activities." They agreed that incorporating technology in their teaching practice is a requirement by the Ministry of Public Education of Costa Rica and that they should be more devoted to providing the necessary professional development.

Lack of professional development. "*So, it would be good for them [MEP] to provide trainings, because in reality, I am Professor of Social Studies, not computer science."* --Profe-Moreno. This need for training was emphasized by all ten participants interviewed, since teachers are expected by stakeholders to incorporate innovative and creative teaching practices. Participants indicated throughout the interviews that trainings are necessary, but that their time is limited; see Figure 13 that shows the times participants mentioned they lacked of available resources. Minnie added the following:

> There's no time. In this case, a training has to be virtual if you want to take a course, because to go there [San José] it is pricy. Also, after the strikes, the MEP does not provide trainings. In other words, if the MEP provides those trainings, and if you go to the principal's office to ask for

permission to attend, it is difficult to get permission. They would also

cut the money from your salary. So, teachers do not have the option to
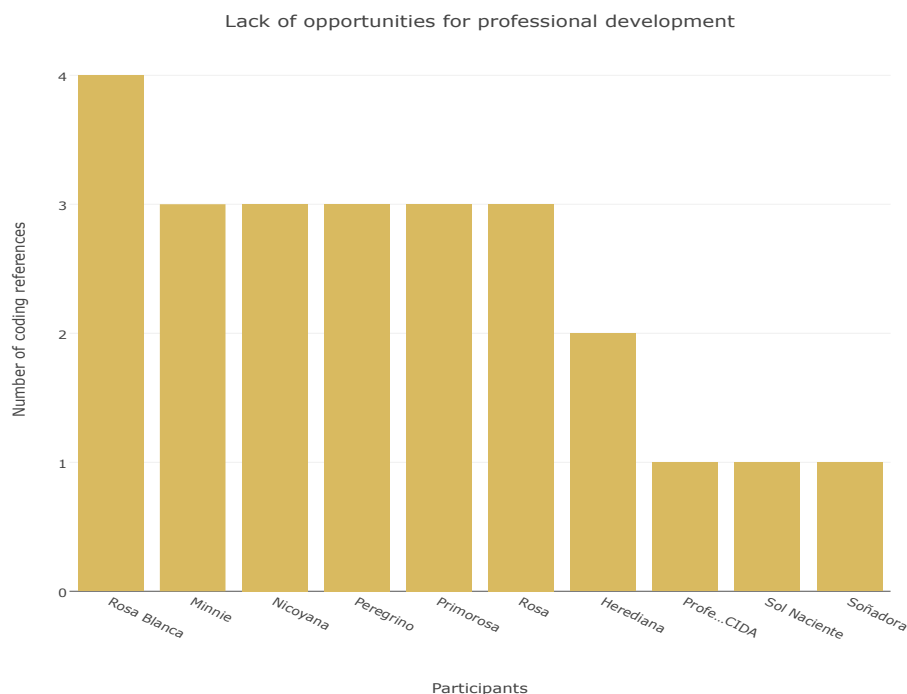
get trainings.

Lack of opportunities for professional development

Figure 13. This bar graph represents the code of lack of opportunities for professional development expressed by the participants. All of the participants mentioned they lacked of opportunities for trainings. This bar graph was obtained from NVivo12 software.

Minnie, as well as other participants, indicated that they lacked time to

attend to some trainings MEP provides for them. The reason why teachers were

not granted permission was that they would need additional time to catch up

with the lessons students missed because of the strikes that took place last year

for several days. Soñadora explained this:

Also, after the strikes, the MEP does not provide trainings. This year

there is a change, it is expected that teachers only teach. The MEP does

not give work permits or trainings. So let's say the MEP leaves you a

little isolated regarding the trainings.

Also, some participants said that the time that the MEP provided for

teachers for trainings is limited. For instance, teachers are given only two

lessons, which mean 80 minutes to learn methodologies they later have to apply

in their teaching practice. After these trainings, stakeholders did not provide the

necessary follow-ups or further training that teachers should have to apply these

methodologies successfully. Minnie said,

But I don't receive any training. For example, if at some point I take a

course regarding to the ICT's, that is two lessons. It's 80 minutes. And

what am I going to learn in 80 minutes? How does the MEP pretend that

I am going to learn something in 80 minutes?

Minnie was upset about the limited time she had for the topic she should

apply in her lessons. It is evident that Minnie would like to have more trainings

or devote more time to learn the content of these trainings. Minnie continued

saying, "To incorporate those technological resources in the classrooms, the

MEP has to be consistent every single year and provide the time to the

teachers." Minnie insisted that this time is necessary, and she needed more

trainings to know how to incorporate technology and mobile devices in her

teaching practices. Peregrino-Gris also added,

But the MEP does not give the follow ups, it is an isolated training.

Then, they give us another training, but there are so many of us that in

the end there is not enough time, because in two hours of a training, we

won't be able to implement those tools, or even in five hours, because there are so many teachers. Not only do they need to show us the tools, but they need to explain the steps, but it doesn't happen.

Peregrino-Gris concurred with Minnie about the limited time they had to learn the content and that stakeholders assumed they need to use it in the classrooms. Both of them agreed that it is critical for teachers to fully know how to incorporate technology in their teaching practices. Additionally, the mere fact of showing teachers technological tools without explaining how to integrate them in their lesson plans was not sufficient to have teachers successfully use them with their students. Finally, Peregrino-Gris said, "I feel limited. If we had more opportunities…"

Throughout the interviews participants conveyed their frustration and disappointment about the lack of time and support they receive from the Ministry of Education of Costa Rica for trainings regarding ICT's or technology. Furthermore, participants also expressed that stakeholders needed to know the reality of the educational context, and that technological practices do not match with the resources that they have. Lack of time and resources to successfully use mobile devices to integrate technology were evident facts the participants described. Participants voiced their complaints and demands regarding this throughout the interviews.

The Paradox: Contradiction between context's reality and

stakeholder's educational goals. "*What the MEP does is to encourage us to apply technology, because we are in the digital era. Everything is technology and that is what catches students' attention.*" --Peregrino-Gris. The statements from the participants showed that they were concerned about meeting the goals of the curriculum , since they stated that they did not have the resources, digital skills, or professional development. There appears that there is a disconnect between Ministry of Public Education in Costa Rica's curriculum expectations and teachers' context realities. The majority of participants were apprehensive about meeting the Ministry of Public Education's educational goals and objectives regarding the incorporation of mobile technologies. Based on the participants' responses, one main theme emerged: The Paradox: Contradictions Between Context's Reality and Stakeholders' Educational Goals.

As Rosa-Blanca mentioned, stakeholders demanded that teachers include technology in their teaching practices. The Ministry of Public Education of Costa Rica's main objective is to include the Information Communication Technologies (ICT's) in the classrooms as part of the new curriculum's expectations; however, some participants complained they did not have adequate conditions for meeting these educational goals. Minnie added to this: "What the MEP does is to encourage us to apply it [mobile device] because we are in the digital era. Everything is technology and that is what catches students' attention." Primorosa said that the Ministry of Education has the goal that participants incorporate technology in their classrooms; however,

participants objected since the Ministry of Education did not support then with the resources: "The (MEP) tells us that we should work in such a way, applying technologies, but we don't have that resource at hand." Primorosa also said the MEP's goal is that teachers incorporate technology and mobile devices in their teaching practice; however, this situation might be challenging if teachers do not have the necessary resources: "The Ministry of Education has that goal always. But in reality, it is different."

Rosa complemented the previous statements with the following, "Now, the Ministry of Education truly demands the use of technology; the MEP demands it, but it does not tell us that in each institution, they will make a room available to work with technological devices." In the previous excerpts, participants indicated that the Ministry of Education required them to incorporate technology in the classrooms, which also included the use of mobile devices; however, participants asserted they had to do it, but they did not have the means to fulfill these requirements. This seemed to provoke frustration and disappointment among participants. For instance, Minnie said, "Sometimes the Ministry of Education says that we do not require technology, but when they observe you teaching, they link creativity or innovation only with technology." In this excerpt, it can be deduced that teachers are expected to use technology and mobile devices even though they do not have it available in their classrooms; otherwise, stakeholders may assume they are not innovative in their teaching practices aligned with the current curriculum's goals.

Profe-Moreno also expressed the same concerns as Minnie and Rosa. He said: "From my point of view, I think that the Ministry of Education demands that we don't use traditional methods, that we have to innovate, but at the same time, they put you in a box." And Rosa-Blanca also added, "And they pretend we work as you are talking about regarding mobile learning, with technological resources, but what do we do if we don't have them? We don't even have Internet access." It is evident teachers are apprehensive about what stakeholders of the Ministry of Education demands of them, and situation with the lack of resources. In this case, some participants expressed that stakeholders should know the reality they cope with on a daily basis, and adjust the curriculum to the students' and teachers' needs.

Peregrino-Gris indicated that stakeholders did not perceive the reality teachers face in their educational context. He considered that the reality teachers face is different from what stakeholders think it is. Peregrino-Gris also said that teachers' needs were not "taken into account" in ways that would allow them to develop activities or ideas that could enrich the curriculum with their experience. Another noteworthy aspect he mentioned was that stakeholders "lack elements of judgment." Peregrino-Gris still considered it that it is important to take into consideration the reality teachers face in the educational contexts to align them with the curriculum demands. He added the following:

> I believe that in the high hierarchies of the Ministry of Education, I
> believe their perception of the reality of the classroom is very different
> from the one we live in the classroom. I think they lack elements of

judgment. Teachers are very rarely taken into account in order to propose strategies or even to design the curriculum.

Profe-Moreno added to the previous statement: "They simply demand that we do not use the traditional methods. But they don't give us the cognitive part; they don't worry about giving us a training over 80 hours." In this statement, Profe-Moreno is clear when he said stakeholders from MEP require teachers to innovate and use creative methods for their classes; but in the meantime, they do not provide the knowledge to do so.

Furthermore, Profe-Moreno said, "They don't worry about giving us a training." This statement mirrored Primorosa when she said the following: "That is like the disadvantage that I feel we have in this region. There is not much interest from the regional educational advisory and the Ministry of Education to provide a better technological preparation to the teachers." Primorosa indicated that stakeholders do not have much interest in providing trainings regarding the incorporation of technologies and mobile devices, especially for teachers from the specific region Primorosa comes from.

Summary

In Chapter V, I described the findings, specifically the data and analysis of the data. I followed Step 9: Determine the Analysis of Data from Leech and Onwuegbuzie (2010) qualitative framework to describe the process I pursued to obtain the emergent themes. I explained the analysis process by describing an analysis chart by Guest et al. (2012) to organize my ideas prior to the analysis of the information from the interview process. Then, I stated the research questions, so as not to deviate from the main focus of analysis. I also described the model of data analysis from Creswell (2013) that I followed to analyze and organize the data. Next, I described Interpretive Phenomenological Analysis (IPA) (Giorgi & Giorgi, 2008; Smith et al., 2009) that I employed to analyze and interpret the data. Additionally, I explained how I analyzed a large sample in IPA. I also described how I used the different strategies that Smith et al. (2009) suggest to analyze the data in IPA analysis within the Creswell (2013) model. After I explained the process I followed to analyze the data, I represented the information visually using bar graphs, word-clouds, and word trees generated by NVivo12 analytical software. Subsequently, I explained the emergent themes from codes, and then the final themes from the triangulation of the information. The last section I wrote described the findings with their respective final themes.

Chapter VI

Implications and Discussion

Chapter Overview

In Chapter V, I described the method of analysis I used to determine the emergent themes from the data obtained from the interviews. In this chapter, Chapter VI, I describe the final steps of Leech and Onwuegbuzie (2010) Qualitative Framework, which comprised (a) Step 10: interpret data; (b) Step 11: validation/legitimation of data; (c) Step 12: write the qualitative research report; and (d) Step 13: reformulate the research questions. This chapter answers the research questions based on the emergent themes connected to the theoretical framework and the literature review before I explain the implications and recommendations for further research. Lastly, I provide the summary and the conclusion of the study.

Step 10: Interpret Data

Discussion of findings. After analyzing the data from the interviews, I re-examined the research questions and how the collected data addressed them. The research questions were:

1. What are select Costa Rican secondary teachers' perceptions of their experiences regarding the incorporation of mobile devices in the classrooms?

2. How do these perceptions of their experiences influence their likelihood of using mobile devices in the classrooms?

3. How do these perceptions of their experiences influence their likelihood

of banning (or not supporting) mobile devices in the classrooms?

Research question #1: What are select Costa Rican secondary teachers' perceptions of their experiences regarding the incorporation of mobile devices in the classrooms? The first theme, "Mobile Devices: A Double-edge Sword", addressed how the participants perceived their experiences when incorporating and using mobile devices in their teaching practices. Most of the participants in this study had mixed perceptions about the use of mobile devices for their pedagogical practices. They expressed the idea that mobile devices were useful as long as there were well-established limits or norms when using these digital gadgets in the class; otherwise, they were likely to be detrimental to the students' learning process.

Negative perceptions. The participants in this study emphasized the negative effects on students when using the mobile device; in this case, they were primarily concerned by the distraction cell phones to students. Most of the participants expressed the opinion that mobile devices detracted students' attention from their tasks. To avoid distraction in the class teachers set their own norms within the class and negotiated with the students regarding the use of their mobile phones. Even though Luna Blanca High School's principal prohibited the use of the mobile device in class unless it was reflected in the lesson plan, the participants indicated that they still used it to enhance some of their teaching practices. For instance, Rosa said she let students use their mobile devices if they finished their in-class activities.

Other participants indicated that they also let their students listen to

music after they finish their in-class assignments. It seemed that participants

had to negotiate with their students so they would finish their work by allowing

them to use the mobile devices if they finished their tasks.

Additionally, some participants indicated that there are not clear

boundaries established by stakeholders for use of the mobile device in the

classrooms. Each of the participants indicated that they devised different

methods to implement the use of mobile devices. Some of the participants

stated that stakeholders did not provide clear guidelines to succesfully

implement the mobile devices. Peregrino-Gris was a participant who stated that

he does not like to use the mobile device unless he had his own well established

rules; however, he also said that users need to have a "culture" to use mobile

devices. As an interesting fact, the Ministry of Education of Costa Rica

provided some recommendations for using the mobile device in the class;

however, it seemed that the participants are not aware of these policies that the

MEP enacted.

When Peregrino-Gris talked about users' lack of "culture," he indicated

that people lack awareness of how to use the mobile device for educational or

beneficial purposes. For instance, Rosa-Blanca, one of the few participants who

said that her students used the mobile device to access pornography, was deeply

concerned about this situation. Additionally, participants were bothered

because students used their mobile devices for social media, shared

inappropriate information with other students, played games, watched videos

and created memes about teachers and students. Hence, Rosa-Blanca also

negotiated and closely supervised the use of the mobile devices by students in her class. If students finished their work, they were able to use their mobile device to listen to music.

Sol-Naciente and Soñadora also mentioned that they negotiated with their students about the use of mobile devices. All of the teachers concurred that students brought their mobile devices into the classrooms, and felt that "99.9 %" of students have one, even if they do not have data to use Internet. In this case, the most appropriate option for the participants is to talk with their students and make them aware that they can use the mobile device under certain conditions. Most of the participants agreed on this, except Profe-Moreno, who prefered to avoid any temptation for students to use their mobile devices in class. He provided clear expectations at the beginning of the school year by telling his students the mobile device is not allowed unless he tells them in advance.

This situation was worrisome and frustrating for most of the participants during the interviews. The participants were also cognizant that they felt their students were in a different era from their era. Likewise, most of the participants said they had to adjust to the students' new habits of using their mobile devices on a daily basis. Thus, participants perceived the use of mobile devices by the students as the *new normal* way of living that students have adopted, and teachers are not able to fight against it.

Additionally, many participants emphasized that they did not belong to the students' era, but they understood that the use of the mobile device is

pervasive. When the participants indicated that they did not belong to the students' era and described that even young children are skillful to use a mobile device, they knew that there is a *borderline* between the youth and themselves; i.e., most of the participants' in this study had ages that ranged from 30 to 45 years old, but they still felt students were more advanced in their use of mobile devices.

The participants also perceived that mobile devices were a great source of distraction for students. Setting the limits and negotiating how to use the mobile device by students is an important step to minimize the misuse of the mobile device. For instance, Nicoyana and Rosa stated that they will tell their students in advance that they have to bring data to work on different projects; however, they know this also represents a risk of distraction. Other participants, as Soñadora and Herediana, preferred to share data that they specifically purchased for students to use; thus students could work on the school activities they have planned with the use of the mobile device.

Nonetheless, according to Rosa-Blanca, some of the students said that their data is for their personal use and not for educational purposes. This is a daily struggle that participants grapple with. Rosa-Blanca added that her typical greeting at the beginning of the class is, "Good morning and put your cell phone away." In other words, the participants often find it challenging that students direct their attention to their mobile devices during class.

When participants were asked what were the activities deviated students' attention from classroom instruction and assignments, participants mentioned

playing games andsending messages through social media. Playing games on their cell phones was one of the recurrent issues teachers mentioned during the interviews. While talking about this situation during the interviews, participants seemed frustrated and helpless. Figure 14 reflects the number of times participants mentioned that students play games in class. Nine out of the ten participants indicated that their students played games with their mobile devices. This likely led to participants' perceptions that the use of mobile devices was detrimental for the learning and teaching process. This also indicates that participants are deeply concerned about this issue and also that they feel thath playing games is not related to learning. Participants indicated that playing games is one of the most frequent activities of students when they get distracted using their mobile devices.
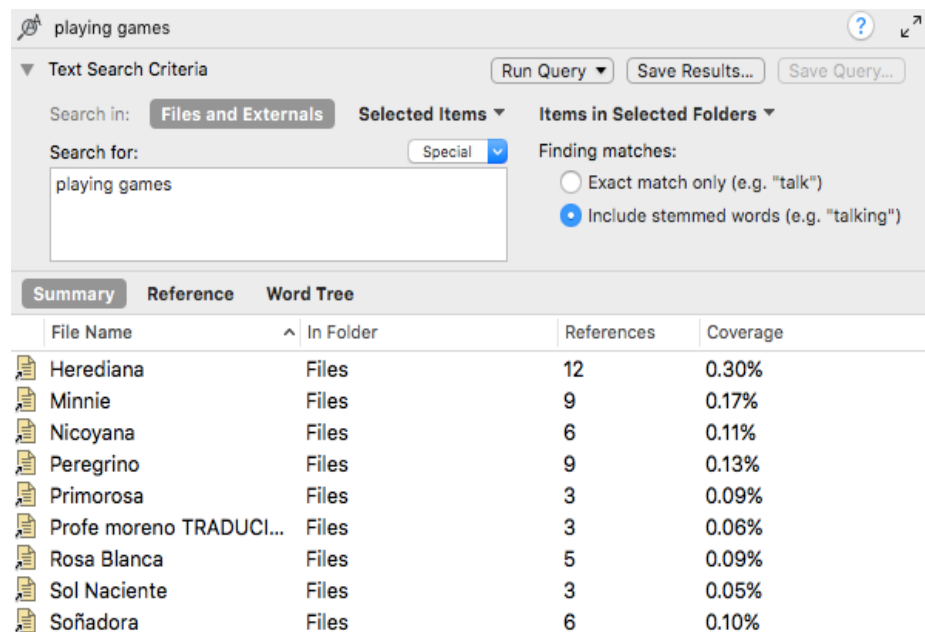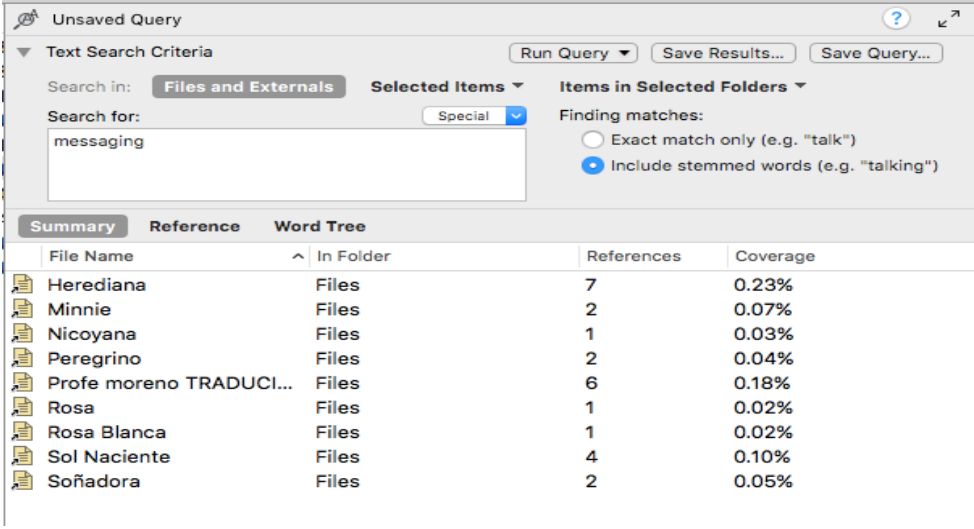

Figure 14. Text search criteria for the word playing games. This image was captured from NVivo12 software and it represents the times the participants mentioned the words *playing games,* when they were asked what activities they perceived students did in the classrooms when using the mobile devices.

Another distraction that participants mentioned when students used their mobile devices was sending messages through social media. Students used Facebook or WhatsApp to send messages to other users (see Figure 15). The participants felt that if the mobile device was not used for educational purposes, students' attention wanders, and it affected the learning and teaching process. Nonetheless, participants were aware that prohibiting the use of mobile devices in the classrooms is not the ultimate solution to avoid their for other purposes. In this sense it seems convenient to create a *user-friendly* atmosphere between students and teachers where student use their mobile devices in class to work effectively and harmoniously. Soñadora and Sol-Naciente were two of the participants who tended to communicate with students and informed them about consequences of using the mobile devices for purposes that were not relevant to their classroom instruction.

Figure 15. Text search criteria for the word messaging. This image was captured from NVivo12 software. This image represents the times participants mentioned studens were using their mobile devices for messaging.

Another negative perception participants expressed during the interviews was the lack of self-control of young students when using their mobile devices. One of the concepts that participants used was that students who were more "immature" did not have the self-control to use their mobile devices conscientiously, versus students who were in advanced levels such as tenth or eleventh grades. Many participants agreed that maturity to use the mobile device in the class is essential when students work on different activities. If students lack of maturity, this deterred their focus from their classroom tasks.

Participants also indicated that working in higher levels with the mobile devices is not as challenging as working in lower levels. This was a frequent perception they conveyed thorughout the interviews, along with the affordability of students' mobile devices. In this case, participants mentioned that almost all students had their mobile devices and they bring them to the class, even though they were aware that its use is prohibited in school.

When asked how students acquired a mobile device, participants believed they got them through the "educational scholarships" provided by *Instituto Mixto de Ayuda Social* (IMAS) [Mixed Instituto for Social Welfare]. The need to provide scholarships to students from low-socioeconomic resources was promoted by the Ministry of Public Education of Costa Rica for students to succesfully complete their primary and secondary education. In this case, to get a scholarship, parents must present the documentation that demonstrates their family truly needs and qualifies for economic help. They also have to present a document from Luna Blanca High School that reflects students are enrolled in

the secondary institution (IMAS, n.d).

These scholarships were also a topic that shed light about participants' frustrations regarding the use of mobile devices in the classrooms. Participants of this study complained that scholarships were not employed by students to get the educational resources to succesfully finish their school years. Participants also explained that IMAS provided the scholarships withouth reviewing students' academic performance; the only pre-requisite for students to get this scholarhip was that students were enrolled in Luna Blanca High School. Sol-Naciente told her students that she felt like "taxes" paid for them to have mobile devices even better than hers. Thus, she called the students' attention to the appropriate use of the mobile devices in class.

The previous scenario shows a lack of leadership by the government in relation to the reality of students and teachers in the different educational contexts. This lack of direction may be detrimental to the development of the teaching and learning in the educational contexts. This also indicates that students often have access to mobile devices without any restriction, and most students bring their mobile devices to school expecting to use them freely. Rosa-Blanca also alleged that even though students may have data for their own activities, they may not want to use their data on educational tasks, which caused even more frustration and dissapointment to the participants.

Additionally, participants also perceived that students were addicted to their mobile devices. Sol-Naciente described the term "nomophia" during the interview indicating how students feel about their mobile phones, which means

the fear or anxiety that being away from a phone with connectity produces to users (Bhattacharya et al., 2019). Sol-Naciente described how a student would prefer to miss the bus to get to school if he or she needs to go back home to get his or her mobile device. Other participants also referred to this as an obssesive or addictive behavior that students display when they constantly use their mobile devices. Sol-Naciente described the mobile device as an "extension of their bodies," indicating that the mobile device is a gadget that students highly value, that is influencing and changing their behaviors. In addition to this, Herediana also said that students seemed anxious if the teachers took their mobile devices away, which poses these questions: Why is the mobile device so attractive for students? Why is this pervasive use of the mobile device found in most of the students? Are there any neurological changes when using the mobile phone? How can students be de-escalated from using mobile devices? Participants in this study were aware of the students' obssesive use of their phone, and even though participants conference with students about when to use the mobile devices, participants were also cognizant they could not control them entirely.

Some participants indicated that this addiction to mobile devices can result in isolation and lack of face-to-face communication among the students. Nicoyana described an experience she had with one of her students in the class. She said that her student was very smart and isolated himself from the rest of the class. Nicoyana reported this to the student's uncle and he said that it was a problem his nephew experienced even at home. Nicoyana voiced her concerns

regarding how the mobile devices can isolate students. She, along with other participants, have noticed students are constantly communicating through their mobile devices. This undeniably revealed how the mobile devices are modifying the way users are communicating with each other. The lack of physical communication between teenagers is an aspect that Rosa-Blanca termed as "dehumanization" among students. She described how students lacked values that would be affecting the manner they interact with other people.

The final negative perceptions participants voiced regarding the use of mobile devices in the class is related to privacy violations. Students in Luna Blanca High School created memes based on the teachers and administrators from the institution. They exposed information that teachers in Luna Blanca High School did not allow them to vent on a Facebook page. Based on this finding, many participants expressed their discontent, and apprehension about the memes created by their students. They were concerned that students could document any situation they consider suitable to create a meme; therefore, some of participants tended to avoid students' use the mobile phone in class, unless they are supervised. Other participants as Sol-Naciente expressed that they believed that memes were a source of creativity for the students. She supported her students' creation of memes about her, but she had to supervise the content of the meme. If the meme was within the norm of respect and consideration, the meme could be published online.

The participants in the study indicated that the principal of Luna Blanca High School was also present on this Facebook page. She prohibited the use of the mobile devices in the classroom, unless they were reflected in the lesson plan. This was a way to prevent students from doing things that were not related to the content they are studying and compromising teachers' integrity. This finding revealed a disconnect between the expectations from stakeholders and the reality that many participants experience in the classrooms regarding the use of mobile devices as a learning-teaching tool. Critical aspects regarding privacy violations and how to deal with them in the institutions should be taken into consideration in the schools' policies and curriculum. This would help teachers and students to use mobile devices more effectively and without major complications.

Positive perceptions. Most of the participants agreed that the mobile device is a useful tool to engage and motivate students in the learning process. Participants have indicated that students are more engaged in the lesson if they use a mobile device, given that students in the classroom are likely to use their mobile phones constantly. In this case, the use of mobile devices could be beneficial to engage and motivate students, which may bring positive outcomes for their academic performance. For instance, participants agreed that students can have quick access to the information, because information is at their finger tips; they can read using mobile devices, communicate with teachers and other students, and use different applications that are innovative for their learning process.

Reading through their mobile devices was one of the activities the participants described as beneficial for their subject. Costa Rican teachers cannot demand that students buy content books or other didactic materials because of economic-limitations; therefore, the participants in the study have realized that getting PDFs of books and downloading them on the students' cell phones is more feasible than the students buying a book. Even though there is a library at Luna Blanca High School, the resources often do not cater the large population of students who attend the institution. Other participants in the study also described how students who do not have the economic resources to buy the didactic materials to take pictures of the information to study at home. This has been an alternative way to have students keep up with the content they are studying in their classes. The fact that most of the students have mobile devices has been embraced as an opportunity for students to obtain information in a context with limited didactical resources and students with economic limitations.

Participants also provided the information to students who needed more academic support. For students who have curricula accomodations, teachers send extra material through messaging applications as WhatsApp. This ease of communication has facilitated teachers and students to have more productive interactions. Additionally, this method of communication is beneficial because, as indicated by the participants in this study, they can provide personalized support to their students.

Another positive perception the participants indicated in the use of mobile devices, is the facilitation of teaching process. Most of the participants indicated that they use mobile devices to get up-to-date information they did not have before. In Costa Rican schools' environments, the limitation of didatic resources is a fact. In general, the participants indicated that Costa Rican teachers need to get the data from the Internet to provide cutting edge information and methodologies. This is highly adventageous for teachers who seek to provide a quality of education to their students. Additionally, even though participants acknowledged mobile devices could be harmful for students, they were also aware this is a powerful learning-teaching tool that should be implemented in their teaching practice.

Based on the findings, participants have mixed perceptions about the use of mobile devices in the classrooms. Technological advances are occurring on a daily basis and the participants in this study were aware of the changes that are taking place in the world ceaselessly. Being aware that we are living in enviroments where technology is contributing to the advance of societies was intimidating and overwhelming for some participants, but these same participants also acknowledged that they needed to adjust to the current world's dynamics. The participants in the study indicated that they were aware that employing technology in excess can be damaging, but if it is used with limitations, responsibility, and good judgment this tool can unlock tremendous benefits for the society in general.

Research question #2 and #3: How do these perceptions of their experiences influence their likelihood of using mobile devices in the classrooms? and How do these perceptions of their experiences influence their likelihood of banning (or not supporting) mobile devices in the classrooms? To answer these two questions, I used Theme 2: Obstacles and Needs to Successfully Incorporate the Use of Mobile Devices in the Classrooms. The participants stated that lack of resources was one of the biggest barriers they faced if they wanted like to incorporate mobile devices in their lessons, and they mentioned the lack of Internet as one of the main obstacles, which is essential for activities using the web. The participants in the study expressed their frustration and disappointment when they said there was an installation to make Internet available for the entire institution, but the equipment was not configured to fulfill this. There is only Internet for the administrative sector, the library, and the virtual room. However, whenever the participants wanted to use Internet, they had to ask to get the password. The reason teachers and students of Luna Blanca High School do not have open access to Internet is because of the Internet at the administration's office would slow down. Some participants did not believe this as a valid reason and they felt misled by the information the institution provided.

In addition, other participants expressed that the lack of access to Internet is a measure to limit students' access no educational purposes. The creation of the Facebook page containing memes about teachers and administrators may have led to the belief that access to Internet is not feasible

for everyone. Some participants voiced that it is necessary to block or ban

websites that may have not appropriate information for the students' integrity,

but that the administrators should open the Internet access since it is beneficial

for the teaching and learning process. However, other participants expressed

the idea that students are digitally skillful and they always find their ways to use

Internet for their own interests. To avoid this situation, the Internet is not open

to teachers or students in any way, which participants indicated highly limits a

teacher's ability to plan to use the students' mobile devices in their classes. On

the other hand, some other participants of this study opt to pay out of their own

pockets for an Internet package service to use it in their classes with their

students.

Because of the lack of resources in the institution, participants are

discontent with stakeholders' demands to have more creative and innovative

classes. The participants of this study indicated that administrators and

stakeholders from the Ministry of Education expect them to incorporate

technology, especially ICT's, in the classrooms, since this is part of the new

curriculum expectations; however, they said they do not have the appropriate

resources to do so. This situation creates some contradictions between what

stakeholders' demand from educators and what they provide to them to fulfill

these expectations.

In addition, the participants have stated that they did not have the

appropriate infrastructure for their equipment. In the majority of the classrooms

there is one outlet that works and that does not help teachers to use it for

technological equipment. Other classrooms do not have the security conditions to leave technological resources that might be lost or damaged.

The poor infrastructure is another barrier the participants discussed during the interviews. They felt isolated and not fully supported by stakeholders. They perceived there is a disconnect between the reality they live in Luna Blanca High School and what stakeholders expect from them. The participants demand they should have at least Internet access to use it for their classes. The participants also described how the virtual classroom is limited for them to use with their classes. The participants said they have barely used this room to teach their classes due to the bureaucratic process they need to endure to get the room.

Additionally, the participants added that outsiders use this virtual classroom but it is often not available to them. The participants found this unfair and disappointing, because they gave up their teachers' lounge room to create the virtual classroom. They said they were "sold the idea," as Rosa-Blanca stated in the interview, they would be using this room to have more creative and innovative classes, but the reality is different from what they were told.

Another obstacle that prevents participants from incorporating mobile devices in the classrooms is the lack of support they perceived from stakeholders. This lack of support resulted in the lack of professional development the participants receive from stakeholders in charge of providing ongoing professional development. All participants agreed that knowing how to

use mobile devices is crucial to successfully apply them in the classroom; however, they lack the necessary instruction or methodologies to put into practice innovative practices. Participants are expected to incorporate the ICT's in their pedagogic mediation, but they have not received trainings about this area recently. Some participants said they have to be self-learners or learn empirically and ask for help from other teachers that are more skillful about technology. The participants also seemed eager and open to learn more about technology, because they know it is necessary for their teaching practice; however, they do not have the time, budget or the training to keep up with innovative technologies.

In the last couple of years, Costa Rica's socio-political and economic environments went through a series of major changes because of the educational and economic reforms the government elected in 2018 proposed for Costa Rica. These reforms cut some salary promotions and added more taxes to Costa Rican payers. These reforms affect teachers' salaries and some benefits; therefore, most of Costa Rican teachers went on strike for more than 90 days to protest these reforms. The Ministry of Education and teachers' unions decided to stop to these strikes, but the conditions required teachers to catch up with the content students did not master during that time.

In this case, the participants also said they are not granted the time to receive professional development. They do not have the permission to receive any training that takes place during the week while they are working. When I asked if they received professional development in the past, the participants said

that they barely had any course or training related to ICT's. Additionally,

participants said that teachers in the capital of Costa Rica or Central Valley have

more options for professional development, rather than those who live in the

northern Pacific Coast of Costa Rica. The participants indicated that if teachers

would like to receive any training, they needed to pay for those courses out of

their own pockets.

Furthermore, the participants mentioned that stakeholders did not

provide them with the appropriate follow-ups for professional development.

Some the study's participants mentioned that stakeholders expected them to

implement innovative methodologies after they received only 80 minutes of

training. Some of the participants said that is not feasible; they need more

support and guidance afterwards. They need to practice and make it more

meaningful to all teachers, because not all of them learn the same way. Some of

the participants indicated that they like technology and find it easier to apply in

the classrooms, whereas others indicated that they need more support since they

felt that they might not be technologically skillful. To illustrate this, Profe-

Moreno said he is one of the teachers who helped other teachers in Luna Blanca

High School to fix technical problems. He said he knows about technology,

because he worked in a technological high school, but he is not a computer

science teacher, and he would like to know more about this area.

Based on these findings, the perceived lack of support in different areas

such as professional development for the participants is evident. If the Ministry

of Education of Costa Rica expects and demands teachers to incorporate ICT's

and the use of digital devices, in their teaching practice, it is pivotal for stakeholders to provide the appropriate time, resources, and trainings for the participants to fulfill the educational goals. Otherwise, this represents a disconnect between what the Ministry of Education envisions versus the reality participants and their students are experiencing in the classrooms.

The likelihood of banning or supporting the incorporation of mobile devices by Costa Rican secondary teachers depends highly on different conditions. First, if teachers have adequate knowledge to use mobile devices in the classroom and they receive the appropriate guidance, they would be more likely to incorporate mobile devices. The Ministry of Education of Costa Rica's curriculum demands that teachers incorporate innovative methodologies, and this is translated as the incorporation of technology in the classrooms. Consequently, being aware of the pervasive use of mobile devices by students and the advantages that mobile devices might have for the teaching and learning process, MEP established regulations that allowed Costa Rican teachers to use the mobile devices owned by students in the classrooms. These regulations give leeway to Costa Rican teachers to use mobile devices. Thus, the participants know that part of the curriculum's requirements is to incorporate technology in the class; nonetheless, with the lack of knowledge, resources and support from stakeholders, it is likely that participants seemed uncertain about how incorporate mobile devices in their classroom practices.

Discussion of Findings in the Context of the Theoretical Framework

I used United Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003) to analyze the findings of my study. UTAUT's comprised four components to describe technological adoption for different users: performance expectancy, effort expectancy, social influence and facilitating conditions determine technological use. Under the light of UTAUT, I evaluated the influences of technology-related factors on how select Costa Rican secondary teachers perceived the incorporation of mobile devices in their teaching practice. I described each of the four factors and the connection with the findings as follows.

Performance expectancy. Performance expectancy is the "degree to which an individual believes that using the system will help him or her to attain gains in job-performance." (Venkatesh et al., 2003, p. 447). Based on the participants' experiences, they perceived that using mobile devices in their teaching practice was helpful to facilitate the teaching and learning process. This finding was consistent across the participants and aligned with Venkatesh et al. (2003) performance expectancy's perceived usefulness construct. Perceived usefulness was manifested by the participants. The participants indicated that using a mobile device or a technological gadget would facilitate the teaching and the learning. Additionally, participants agreed that mobile devices enabled them to perform tasks more easily. Thus, participants stated that they use the mobile devices to communicate with students, send content students need, and acquire information to enrich the content of their classes.

Furthermore, the participants of the study indicated that their classes were engaging and creative. In the light of performance expectancy's relative advantage, where the innovation is superior to its predecessor, participants also concurred that using mobile devices in their classes was more beneficial than using customary activities, which were often not appealing to their students' interests. Participants were aware that using mobile devices was an advantage to gain students' attention and get the necessary information for the class; however, coupled with the benefits of using mobile devices, participants were also aware of the challenges mobile devices have brought in their lessons, like distraction and misuse of the mobile device by the students. The latter would affect participants' likelihood of adopting the use of mobile devices as part of their teaching practice.

Age and gender, which are two moderators of performance expectancy, were not fully reflected. Eight out of the ten participants were women between 33 to 45 years old. According to Gender schema, differences between females and males stem from their roles as a consequence of the socialization process rather than biological gender characteristics per se (Bem, 1981; Bem & Allen, 1974; Kirchmeyer, 1997). Additionally, research has demonstrated that men tend to be more task-oriented (Minton & Schneider, 1980) and that task accomplishments tend to be more salient to them. Nonetheless, this was not fully reflected on these findings since the majority of participants were women and there were only two male participants. Regarding age, where "younger workers may place more importance on extrinsic rewards" (Venkatesh et al.,

2003, p. 450), this was not evident either because this was not part of the focus of the investigation.

Effort expectancy. Effort expectancy is the "degree of ease associated with the use of system." (Venkatesh et al., 2003). These voluntary and mandatory contexts are significant, but they become nonsignificant over an extended and sustained period of usage. In this case, the first-time individuals use a system, this construct is more salient (Venkatesh et al., 2003).

Also, this construct is associated with the facility a user perceives when using a system. Gender and age are two factors that are highly related to the previous statement. Older age has been associated with the degree of difficulty in using a system or any technological device because of the "complex stimuli and allocating attention to information to the job," and the effort expectancy constructs have been more prominent in women than men (Venkatesh et al., 2003, p. 450).

According to the findings, effort expectancy was present with the participants of the study. Some of the participants expressed that they lacked the knowledge to use mobile devices in the classrooms effectively. This is associated with complexity that is defined as "the degree to which a system is perceived as relatively difficult to understand and use" (Venkathesh et al., p. 451).

Complexity is a construct that explains effort expectancy, and that is associated in the way participants expressed their concerns about being "ignorant" when using mobile devices for their class. Many participants felt

they did not have the abilities or were not as skillful as their students in using the mobile devices. This lack of knowledge may provoke reluctance to use digital technologies and mobile devices with participants who may not want to be perceived as outdated. In this case, some participants stated that they tend to ban the use of mobile devices.

On the other hand, some other participants felt they had the abilities to learn more about mobile devices and various technologies, but the lack of professional development was a barrier for them to accomplish that goal. This statement is related to ease of use construct that is defined as "the degree to which using an innovation is perceived as being difficult to use." (Venkatesh et al., 2003, p. 451). Even though the participants felt that they are capable of using mobile devices in the class, they perceived it difficult to manipulate or navigate a new technological gadget; this might prevent them from successfully incorporating it in their teaching practices. Some of the items Venkatesh et al. (2003) selected to describe this construct were "my intention with the system is clear an understandable, I believe that it is easy to get the system to do what I want it do to, and learning to operate the system is easy for me" (p. 451).

In this case, some of the participants expressed that they had the intention and the abilities to use technology. They also may feel able to handle to use these mobile devices in the classrooms, because they like technology; but they also emphasized that they needed the appropriate knowledge to accomplish it. The intention to ban or incorporate mobile devices in the classrooms

depends on the self-perceived abilities and the knowledge participants have towards the implementation of technology in their teaching practice.

Social influence. According to Venkatesh et al. (2003), social influence is defined as "the degree to which an individual perceives that important others believe he or she should use the new system" (p. 451). In this case, the intentional behavior to use mobile devices and technology in the classrooms is influenced by the notion that participants have about how others would view or perceive them if they use mobile devices and technology in their teaching practices. This behavior is non-significant in voluntary contexts, but it is present in places where they are mandated. Thus, if an individual perceives he or she is required to perform an activity using technology, he or she would likely to do it. The image an individual reflects to people they consider of value is crucial.

The participants expressed the idea that they had to incorporate technology as part of the demands of the curriculum. Even though participants mentioned they did not have the technological resources, they need to fulfill this requirement of their stakeholders such as the Ministry of Education. The social pressure and influence participants receive from stakeholders requires teachers to plan activities related to ICT's in their classrooms, which is part of the curriculum's demands. Participants are evaluated based on creativity and innovation criteria, which are presumably linked to technology. Based on this social condition, participants tend to employ mobile devices within their classes.

Facilitating conditions. Facilitating conditions was a determinant of behavior to use technologies in the classrooms that was highly evident within the participants. It is defined as "the degree an indidual believes that an organizational and technical infrastructure exists to support use of the system" (Venkatesh et al., 2003, p. 453). All of the participants expressed the lack of resources and poor infrastructure were two factors that limited the use of mobile devices. This was a strong determinant of behavior to incorporate technology or mobile devices in their teaching practice. The environment surrounding the study's participants influences their willingness to incorporate mobile devices. Three of the constructs that explain facilitated conditions were connected to the findings: perceived behavioral control, facilitating conditions, and compatibility. Perceived behavioral control "reflects perceptions of internal and external constriants on behavior and encompassess a self-efficacy, resource facilitating conditions, and technology facilitating conditions" (Venkatesh et al., 2003, p. 454). Thus, for the participants the most important aspect for incorporating any type of tehcnology in the classroom was having the appropriate resources.

Additionally, the participants were concerned about the self-efficacy for use of technological devices; this is related to the self-perceived ability they have to use any technological device. Three participants were reluctant to use mobile devices in the class. Rosa said she did not like technology, but she has to use it as part of the curriculum requirements, and Peregrino-Gris and Rosa-Blanca did not like how students are misusing their phones in class; thus, they

tend to minimize the use of phones in the classrooms.

Facilitating conditions is defined as "objective factors in the environment that observers agree make an act easy to do, including the provision of computer support" (Venkatesh et al., 2003, p. 454). This construct includes the guidance and the availability a group of people or supporters have toward individuals using any technological device. Regarding support, guidance and availability to appropriately use mobile devices for the teaching practice, the participants alleged they did not have the time and resources to do use technology and mobile devices.

The lack of professional development is limited for the participants, which is also a limitation for the appropriate use of mobile devices in the class. One of the participants in my study voiced that other institutions provide the tools so their employers can succesfully do their jobs. In this institution, participants need to provide their own resources to accomplish stakeholders' demands. Moreover, when the participants asked for any type of resources, the lack of budget is one of the reasons that prevented them from acquiring any technological gadget.

Finally, compatibility is defined as "the degree to which an innovation is perceived as being consistent with existing values, needs, and experiences of potential adopters" (Venkatesh et al., 2003, p. 454). This last construct expounds how technologies or any system is compatible with the current aspects of the individuals' work. In this regard, there is a contradiction between the expectations of stakeholders' curriculum and the conditions participants have to

perform their jobs. Traditional and innovative teaching practices are being bridged by the participants, but with great limitations. The study participants seemed to be working in environments that do not fit with the 21st-century demands, which is one of the main necessities of today's society reflected in the educational system.

In addition, values and experiences of the participants are strong aspects that influence them to use technology in their teaching practices. According to the findings, participants' experiences and perceptions with mobile devices in the classrooms are mixed. They perceived mobile devices as detrimental due to the students' misuse, but they also described mobile devices as beneficial for the teaching and learning process. Venkatesh et al. (2003) stated that facilitating conditions are influenced by predecesor usage of any technological sytem; in other words, the "effect is expected to increase with experience as users of technology find in multiple avenues for help and support throughout the organization" (p. 454). In this regard, if the participants received more support and help from stakeholders in charge, it can be predicted that they would be more likely to sustain the use of mobile devices in the teaching classrooms.

Discussion of Findings under the Review of the Literature

The rapid increase in the use and consumption of mobile devices has changed the landscape of the traditional educational practices (Khaddage et al., 2016; Sharples, 2000, 2005; Traxler, 2007). The current world is being transformed because of the technological advances that have provided innovative and cutting-edge ways to communicate, interact, collaborate,

andaccess information in an instant (Merchant, 2012). Thus, traditional ways of
learning have to be transformed, as digital technologies have changed the
concept of transmitting and receiving knowledge to a more constructivist and
proactive form of creating and sharing knowledge (Khaddage et al., 2016;
Sharples 2005; Traxler, 2007).

Thanks to the Internet and mobile devices, individuals have easy access
to the world's events and the information at their finger tips (Crompton, 2013;
Merchant, 2012). Mobile devices are owned by a great majority of the world's
population (Schwab, 2017) and are also being introduced into educational
settings, where their potentialities are not being explored (Crompton, 2013).
Consequently, mobile learning has been gaining ground and is being promoted
across different educational settings, including developing countries; Costa Rica
has not been the exception (MEP, 2016, 2018).

In light of the extensive liteture review that informed the present study, I
described the findings regarding select Costa Rican teachers' perceptions of
their experiences about the incorporation of mobile devices in the classroom as
follows:

Mobile devices: A double-edge sword. The participants had conflicting
perceptions about the use of mobile devices in their teaching practices.
However, they tended to have a more negative opinion about using mobile
devices in their classrooms than a positive one. The participants agreed that
mobile devices are a distractor for students (Lenhart, Duggan, Perrin, Stepler,
Rainie, & Parker, 2015). This finding aligns to Leung's (2017) research, where

students in Denmark who were using their tablets were off-task by messaging in social media and playing video games. The participants indicated that they have had the same experiences while students were using their mobile phones in class that mirrors the findings in Jahnke et al.'s (2014) study. Sharples (2002) added that students establish a communication channel with the outside world, which deviates their attention from teaching and learning from the curriculum. This situation creates conflicts between what teachers expect from students in class versus what they are actually doing in the classrooms (Jahnke et al., 2014; Lenhart et al., 2015).

Distraction was highly related to the students' dependency on their mobile phones. The constant need to be using or touching the mobile devices was a recurrent perception participants voiced while describing how the students interacted with their mobile devices in the classroom. This situation is also reflected on different research where the unceasing thoughts and touching the cell phones were present in students' behaviors (Cumaoglu, 2015; Leung, 2017; Shuib et al., 2015; Terras & Ramsay, 2012). However, the participants perceived that students who are in higher levels or who are more mature are inclined to be more in control in their use of mobile phones and mobile devices. According to Kane and Engle (2002), executive functions plays a pivotal role when performing different tasks; in the case of mobile devices, it is relevant that students know how to master, be critical, and control their behaviors when engaged in different activities. This finding is something that should be furthered analyzed in future research.

Another perception participants expressed during the interviews was the lack of students' culture for using their cell phone for educational purposes. This is highly related to students lack of self-control and knowledge of how to employ their mobile devices for their learning process. Khaddage et al. (2016) expressed the necessity for teachers and students to know the potentialities of the mobile devices; thus they can be maximized for the teaching and learning process. In addition to knowing how to employ the different features of the mobile devices, it is crucial to have a well-planned and well-developed curricula that supports and facilitates the use of mobile devices in educational settings (Khaddage et al., 2016; Liu et al., 2014; UNESCO, 2013a, 2013b; Pegrum et al., 2013).

In this fashion, participants did not mention there was a specific methodology that supported the use of mobile devices or mobile phones in the classrooms, and the use of technology is part of the new educational goals for the 21st century. Thus, participants had their own regulations or norms to cope with the challenges they face when using mobile devices in the classrooms; nonetheless, even though there is a restrictive environment for the students to use their mobile devices, they still use their mobile devices for personal purposes. Khaddage et al. (2016) stated that the mere act of owning a mobile device did not guarantee students and teachers would use it for educational purposes, and there should be a learning environment that encompasses the principles, goals, designed instruction, and pedagogical strategies that can enhance the learning and teaching process (UNESCO, 2012).

Similarly, UNESCO (2012) has encouraged different educational institutions around the globe to promote and create curricula, where teachers become active participants in the construction of the curriculum, since they are the experts in the classrooms. In this case, all the participants of this study should be cogninzant of the constant innovative and challenging changes that take place daily with technology, and how the educational paradigms are shifting because of these changes (Keengwe & Bhargava, 2014; Khaddage et al., 2016; UNESCO, 2012).

Another relevant finding from the interviews was the privacy violations. Participants reported that students created memes based on some administrators and some teachers from Luna Blanca High School, and published them on a Facebook page without their consent (Procházka, 2018). Procházka (2018) addressed the issue of memes:

> Based on the memes around which the community is centered and their rapid diffusion, the process of community formation is a never-ending process resting on a constant negotiation of shared values as well as expectations and preferences in communicative practices – including their acknowledgement, disputation, authentication, and other social processes (p. 78).

In this Facebook page there are memes about certain teachers and administrators from Luna Blanca High School, where students described some shaming situations that teachers at this institution did not agree to share. Some participants felt that the privacy of those teachers was violated by the memes

that did not respect their integrity, and that was indeed exposed online. This online shaming was an interesting finding since it is a relatively new phenomena in the arena of privacy issues on digital spaces (Cheung, 2014). Cheung (2014) said that

> This new form of shaming involves the exposure of personal identifiable information of the targeted individuals, who are perceived to have transgressed different degrees of social norms (though often violated none or only minor legal offences), for the purpose of humiliation, social condemnation and punishment (p. 302).

Thus, students were not aware of the boundaries and thin lines of what online privacy meant; they did not have any reluctance in publishing teachers at Luna Blanca Schools'pictures on social media, which lends to the question of what exactly is private and what is public regarding online spaces? (Gerber , Abrams, Curwood, & Magnifico, 2017; Park & Jang, 2014). In this case, the administration banned the use of the mobile devices in the institution and some of the teachers followed this norm accordingly.

Other participants were not appalled by the memes' creation; instead they said it was a form of creativity and that it was interesting that students did not take them for granted. Some participants praised the students who had this way of using their digital skills to invent memes that were creative. This is in line with what Neimeyer, Ingram, and Gerber's (2017) PSAT meme research found, which chronicled what they termed, satirical dissidence; students' creation of memes to creatively voice displeasure with policies and regulations

that they do not agree with. Similarly, Purnama's (2017) research regarding the use of memes and Instagram for language learning had favorable results when using these digital forms to engage and motivate students in learning a language. Digital tools are are highly appealing and interesting for the new generations, who are in constant communication and interacting online; not using them in the teaching practice would likely isolate students from their daily life world (Purnama, 2017).

Soñadora mentioned that she talked to her students about using memes to shame teachers, encouraging them think before creating them and the legal implications it may entailed. The previous idea mirrored Park and Jang's (2014) research where they stressed the importance of informing low-literacy students regarding privacy issues about the consequences of their actions when posting online. It is necessary to provide students and teachers with the appropriate curriculum to use digital tools thus, they can make informed decisions about their future posts on different online spaces. Additionally, this can be beneficial for teachers and students to use mobile technologies seamlessly and appropriately.

Some participants expressed that using mobile devices in their teaching practice was positive (García & Chikhani, 2012). The participants of the study also perceived that the use of mobile devices was engaging and motivating for students (Cosío et al., 2018; Cristol & Gimbert, 2013; de-Marcos et al., 2010; Koutromanos & Avraamidou, 2014). This positive perception about the use of mobile devices in the classrooms was noticeable among participants; they

expressed how their students are prone to do in-class activities since they are constantly using their mobile devices (Merchant, 2012). In addition, another positive perception participants expressed about the use of mobile devices was the facility to communicate and interact with their students (Álvarez-Quiróz & Blanquicett, 2015; Cosío et al., 2018; Crescente & Lee, 2011; Sheninger, 2015; UNESCO, 2013a). Participants in the study stated that they have used the mobile devices to support students who need more content or information in class, which makes a more personalized learning and teaching process for the students and teachers (Crompton, 2013). Likewise, participants stated that the use of mobile devices allows them to provide immediate feedback if students request it (Durall-Gazulla et al., 2012).

Additionally, this reflects the new learning ecology concept (Barron, 2006; Lai et al., 2013; Lee et al., 2015; Spires et al., 2012), in which bridging out-of-school and in-school learning activities may enhace the students' learning development through the use of digital devices (Ponners & Asim, 2016; Sung et al., 2016). In this fashion, participants added that students develop their projects and present them in the class. Students use their mobile device to access to the realm of information they cannot find in the libraries because of the lack of didactic resources; thus, the use of mobile devices in educational contexts where students have limited resources is highly beneficial for their learning (Álvarez-Quiróz & Blanquicett, 2015; García & Chikhani, 2012; UNESCO, 2016, 2017; Purcell et al., 2013).

In addition to the previous benefits participants perceived with the use of

mobile devices in the class, participants also expressed how students tended to download information and digital books on their mobile devices, and read their digital material on the spot and at their convenice (Crompton, 2013; Peng et al., 2009; Traxler, 2007). This resonated with the different salient characteristics of mobile devices that several authors have described, where users have the ability to assimilate content on-demand, carry unlimited amounts of information, and access this information whenever they have connectivity (Crompton, 2013; Peng et al., 2009; Traxler, 2007; Valvoula & Sharples, 2009). The portability of the mobile devices offers teachers and students learning opportunities that were limited before the incorporation of mobile devices in their teaching practices (Traxler, 2007; Valvoula & Sharples, 2009).

All of the previous advantages participants described about using mobile devices in the classrooms have facilitated their teaching and learning process. Therefore, I posit that participants did not seem reluctant to incorporate mobile devices in their classrooms, but that they presented themselves as hesitant about how to implement them effectively to avoid the negative effects mobile devices can have on the students' academic performance. Thus, knowing that mobile devices can be beneficial for their teaching practice and may influence participants to take advantage of the mobile devices that students owned; however, as evidenced by participants, they still are hesitant about how to implement them effectively into their teaching.

Teachers' perceived challenges to successfully incorporate mobile devices in the classroom. The succesful incorporation of mobile technologies in the school settings is affected by a series of challenges stated in different research (Khaddage et al., 2016). During the interviews, participants discussed a series of obstacles that prevented them to use mobile technologies. These challenges included lack of resources, lack of support from stakeholders, and need of professional development. All of these hardships are reflected in Khaddage's et al. (2016) research about the challenges to implement mobile learning in the teaching practices and Ertmer's (1999, 2005) first and second order barriers. Ertmer described first- and second-order barriers that affect teachers' beliefs regarding the incorporation of technology in their classrooms. The first-order barriers are related to the lack of resources, time for training, and support received, and the second order barriers encompass skills, knowledge, attitudes, and beliefs (Ertmer, 1999, 2005; Ertmer & Ottenbreit-Leftwich, 2013). These challenges highly influence teachers' beliefs about technology and its adoption in their teaching practices.

Some of the mobile learning challenges described by Khadagge et al. (2016) and Ertmer (1999, 2005) were reflected in the study's participants, when facing difficulties while using mobile devices in the classrooms, which may have mediated the incorporation of tecnology in the curricula. Based on Tondeur et al.'s (2017) synthesis of 14 qualitative studies regarding the connection between teachers' pedagogical beliefs and the integration of technology in the classroom, their findings suggested that the value that teachers

delegate to technology is a determinantal factor for them to employ technology in their teaching practices. In this regard, if the participants highly value digital advances, they would be more likely to implement innovation in their classes (Tondeur et al., 2017).

Other findings of Tondeur et al. (2017) indicated that teachers' learning and teaching views mediated the way teachers integrated the digital tools in the classroom. If teachers had a more student-centered view, they were likely to use technologies in more innovative forms, whereas teachers who had a more teacher-centered view used technology in more traditional ways (Tondeur et al., 2017). Likewise, teachers who had a more traditionalist perception of their teaching practices viewed technology with less value rather than teachers who percieved technology differently. Finally, the amount of interaction teachers had using technology enabled change in teachers' pedagogical beliefs to incorporate technology (Tondeur et al., 2017). The previous statements informed the challenges partcipants of this study experienced while incorporating mobile devices in their classrooms, and how these challenges may have mediated their beliefs regarding the incorporation of mobile technologies.

Participants agreed that lack of resources was the main challenge they faced to incorporate the mobile devices effectively. This finding mirrored similar results from research, where lack of resources was detrimental for the succesful incorporation of technology in the class (Ertmer, 1999, 2005; Ertmer et al., 2012; Ertmer & Ottenbreit-Leftwich, 2010). Participants discussed the lack of access to Internet as a major challenge they faced for planning their

classes and using mobile devices. The lack of connectivity is an impediment for the participants and students in searching for content and performing different activities where students need to use mobile devices. This finding mirrored research of Jahnke et al. (2014), where teachers from Denmark experienced difficulties with connectivity and usage malfunction of digital tools. The breakdowns and bad connection during the class hindered the flow of the pedagogical activities and had teachers invest more time of the lesson to fix complex problems while using the technological tools.

In addtion, the lack of an adequate infrastructure is another hardship the participants of the study described as unfavorable for the use of mobile technologies. Research conducted about this has found that it is fundamental for teachers to have the right conditions to incorporate technology; otherwise, they would not meet the expetected technological and educational demands (Jahnke et al., 2014; Tondeur et al., 2017; Vongkullsksn et al., 2018).

Another challenge the participants expressed was the lack of professional development and knowledge regarding mobile devices and their incorporation in their classrooms (Christensen & Knesek, 2018). Knowledge is part of the second barriers Ertmer (1999, 2005) described as highly influential on teachers' beliefs about integrating technology in their classrooms (Ertmer et al., 2012). Ertmer et al. (2012) described how teachers who had a strong pedagogical value of technology have overcome the second barriers. This mirrored Shapley, Sheenan, Maloney, and Caranikas-Walker's (2010) study, where the level of technology implementation in the class was determined by

the quality of professional development provided to the teachers. Ertmer et al. (2010) also added that a shift in teachers' mindsets is a determing factor for teachers to adopt technologies. This mind-set shift implication is in direct line with the findings from Gerber and Price's (2013) study of teachers and game-based learning. Teachers in their study felt that even if they were provided professional development from the admistrator's level, as teachers they would be seen as only innovating the teaching with video games and technologies, so as to appear cool and hip with the students.

The participants said receiving trainings regarding the incorporation of mobile devices was crucial to their development and ability to use mobile devices in their teaching practices. The lack of the digital skills to navigate through mobile devices was continuous across participants' interviews. In this case, they not only needed to know how to use the mobile devices, but participants felt that they should also be informed about how to plan their lessons using mobile devices. To this, the need to know how to connect technology, content, and knowledge parallels with Mishra and Koehler's (2006) TPACK model. The TPACK model states that the intersection between technonology, pedagogy, content, and knowledge is critical for teachers to support their educational practices with the incorporation of digital tools. This is a multifaceted matter that is not simple to assimilate, because teachers should be aware of what technology entails and possess the skills and competences to handle technology successfully (Christensen & Knezek, 2018; Harris et al., 2009; Navaridas et al., 2013; Taimalu & Luik, 2019; Tondeur et al., 2017;

Sheninger, 2015). Thus, the need for professional development is crucial for the participants to navigate through technological tools that let them innovate and revolutionize their teaching practices (Christensen & Knezek, 2018; Navaridas et al., 2013; Taimalu & Luik, 2019; Tondeur et al., 2017).

Christensen and Knezek (2018) have stated that " teachers must have supportive training on the pedagogy of integrating these devices as well as useful strategies for classroom management that will enable the teachers to feel confident in their classroom instructional environment" (p. 380). This statement concurred with Ertmer et al. (2010) and Khadagge et al. (2016), where the need for support from administrators is crucial for teachers to change their pedagogical skills for the newer learning environments and students' learning styles (Johnson, 2013; Christensen & Knezek, 2018).

There is disconnect between what the Ministry of Education of Costa Rica expects teachers to accomplish in their teaching practice based on the curriculum's goals versus the context reality teachers live. This is a situation that participants described during the interviews. It caused frustration and hesitation about how to teach in contexts where there are not the appropriate conditions to support these expectations. Costa Rica's education is going through a series of educational reforms and tranformations, because of the global changes that are happening and that are also affecting the country. Stakeholders, administrators, teachers, students, parents, and the community are the main actors that can accomplish and adjust to these transformations succesfully. Time, perseverance, commitment, patience and a set of well-

established goals are core elements to lead the future of a nation toward steady progress; nonetheless, it is fundamental to have a quality of education that can direct people toward that goal.

To better illustrate how the findings meld with the theoretical framework and the literature, I comprised a figure that shows the findings with their themes and subthemes as related to the literature and the theoretical framework (see Figure 16).
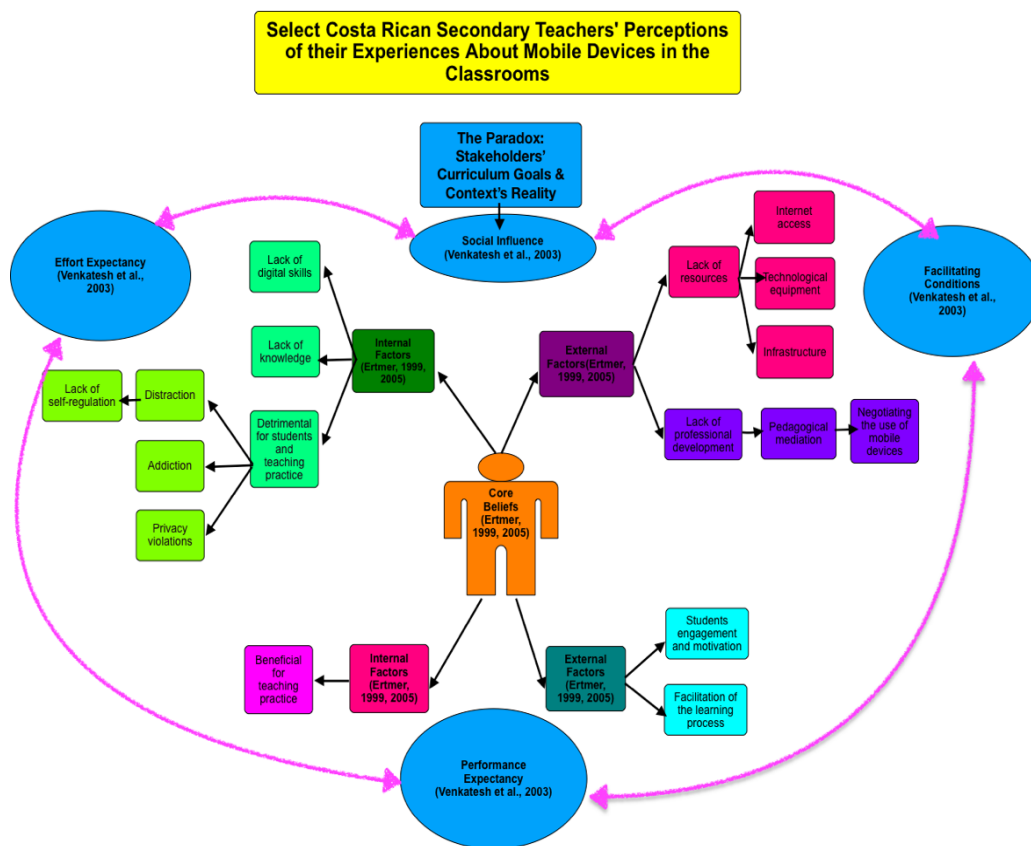

Figure 16. This is the graphical representation of the findings of my study: Select Costa Rican Secondary Teachers' Perceptions of their Experiences about the Incorporation of Mobile Devices in the Classrooms under the light of UTAUT framework and literature review. This graphic encompassed the findings and the connection they had with the theoretical framework; in addition to the literature review's tenets that informed the discussion of the findings.

Step 11: Validating/ Legitimating of the Data

In Chapters I and III, I explained the methods I employed to validate the data from the findings. I followed Creswell's (2013) strategies to provide trustworthy claims that reflected the participants' voices, in which I used data saturation, triangulation of the findings, and member checking. Creswell (2013) considers "validation in qualitative research to be an attempt to assess the "accuracy" of the findings, as best described by the researcher and the participants. This view also suggests that any report of research "is a representation by the author" (p. 250). Creswell (2013) also added that for phenomenological research the validation of the findings is supported when an idea is well supported and well grounded.

For IPA a study should capture the essence of the participants' lived experiences and transmit it to the reader in a transparent and trustworthy manner (Creswell, 2013; Giorgi & Giorgi, 2008; Smith et al., 2009; Smith & Osborn, 2015). Smith et al. (2009) stated that for IPA, sensitivity is one touchstone to address in the IPA study's report. Sensitivity is at stake when interpreting and describing the participants' claims; in this case, thick descriptions of the findings are an attempt to have the reader try to make sense of the participants' experiences. Smith et al. (2009) stated:

> a considerable number of verbatim extracts from the participants'
> material to support the argument being made, thus giving participants a
> voice in the project and allowing the reader to check interpretations

being made. And a good IPA is written carefully, making claims

appropriate to the sample which has been analyzed. (p. 180).

Taking into consideration participants' voices through their claims is

noted as a reflection of sensitivity to the message they wanted to convey.

Therefore, during the writing of the findings, I took into consideration what the

participants expressed regarding the phenomena under research. I also carefully

extracted verbatim quotes from the interviews' transcripts, attempting to fully

exhibit the participants' experiences and perceptions about the use of mobile

devices in the classrooms. In the following I describe how I validated the

information of the findings.

Data saturation. Guest et al. (2006) suggested that when using non-

probabilistic samples such as snowballing, researchers need to use the data

saturation technique. Guest et al. (2006) described that 12 in-depth interviews

would provide saturation of the data. In this research, I recruited 10 participants

who provided rich and extensive information about the phenomena under

research. Data saturation were evident after reading and re-reading the

information provided by the participants. This reflected the confirmability of

the findings rather than objectivity as Creswell (2013) stated. In this case, a

confluence of evidence establishes credibility and provides confidence

regarding the observations, interpretations, and conclusions of the findings of

the study (Eisner, 1991).

In IPA analysis, providing thick descriptions of the participants' claims

is compelling to reflect the essence of the phenomena under research (Smith et

al., 2009). Therefore, it is necessary read and re-read rigorously the information in order to not omit any claim or piece of information appealing to the participants' lived experiences. In this case, I thoroughly read the information and reflected upon the emergent themes conveyed in the body of data that I obtained from the data collection and the analysis process. Additionally, this process reflected the confluence of evidence that Eisner (1991) described to provide credibility of the findings; which was also expected to do in IPA analysis.

Triangulation. Triangulation of data is described as the variety of methods that the researcher can employ to validate and corroborate the information; which may include data sources, theoretical perspectives, and investigators (Creswell, 2013; Denzin, 2012; Johnson & Christensen, 2014). During the data collection, I gathered a series of information that aided me to for the triangulation of the data. First, I had a journal that I used to take notes about the process of the data collection and my thoughts about the data analysis. In the data analysis, I had annotations and memos that helped me reflect upon the participants' claims, perceptions, and experiences. This was of great help for drafting the themes of the findings. Additionally, I obtained information from memes a participant provided me as well as having access to a public Facebook page with memes about Luna Blanca High School. Finally, I also crosschecked Costa Rica's curricula that I obtained from the Ministry of Education's publicly available website.

Member checking. Mertler (2016) described member checking as when the researcher asks the participant involved in the research to verify and check if the report reflected what they conveyed. To do the translation of the interviews from Spanish to English, I had the participants to check the transcripts in Spanish and let me know if the transcriptions were according to what they expressed. I sent the transcriptions through end-to-end encrypted WhatsApp message service and some of the participants recommended some changes regarding grammatical errors. The other participants agreed with the transcriptions of the interviews. For phenomenological research, having the participants to check the veracity of the assumptions and claims reflects trustworthiness of the participants' experiences' essence.

Reflexivity. Johnson and Christensen (2014) indicated that reflexivity is a key strategy that aids the researcher to be self-critical and self-reflective about his or her research. This would also help to identify bias or any predisposition that may have provided a different perception of what the participants intended to say during the data collection. This strategy is beneficial for IPA analysis to provide interpretations that express the essence of the participants' experiences. Smith et al. (2009) indicated that the researcher in IPA has to be in the participants' shoes to filter the information through the participant's lens. In addition, the researcher is also taking part in the research process, where he or she is trying to make sense of the participant's world through his or her own experience. This reasoning is different from the "epoch" approach in

Transcendental Phenomenology (Moustakas, 1994), where the researcher

brackets herself from the research to avoid any bias.

I opted for an Interpretive Phenomenology study under an ontological

view, which relates to the theory of existence or what it means to be human

(Giorgi & Giorgi, 2008). I also followed Heiddeger's idea about Dasein's

concept, where "the question of being arises and its task is to interpret the

meaning of being" (Giorgi & Giorgi, 2008, p. 167). For this endeavor, I

employed a journal and memoing, where I wrote thoughts and assumptions

related to the information I was obtaining from the data analysis. I read them

constantly and questioned whether what I wrote was what the participants

wanted to convey.

This process took place during the data analysis, because I did not want

to disregard any criteria or conclusion that was not according to the participants'

voices. However, at the same time I was reading and writing about participants'

data, I was living through the experiences they had and trying to understand

what they meant for them. I interpreted this information according to my own

cultural and personal background or schema. Coupled with this, Heiddeger

stated researchers cannot bracket themselves, since they always have previous

knowledge that helps with the interpretation of the participants' lived

experiences (McConnell-Henry et al., 2009).

Step 12: Writing of Research Report

Following Step 12 of Leech and Onwuegbuzie's (2010) qualitative methodological framework, I wrote the final implications and future research recommendations. I based this report on examining the significance of this research, the literature review, and the theoretical framework that informed the discussion of the findings, and the research questions that started this research.

Final implications. The educational landscape in diverse educational contexts is rapidly changing, thanks to the technological advances (Crompton, 2013; UNESCO, 2012, 2013a, 2013b). Mobile learning is a phenomenon that has revolutionized the way education is transmitting and constructing knowledge across the globe (UNESCO, 2012). The use and consumption of mobile devices such as cell phones, iPads, or laptops has allowed users to communicate, interact, share, and access and absorb vast amounts of information anywhere and anytime (Sharples, 2000, 2005; Traxler, 2007, 2005). There are no boundaries for communication across different countries and people, which has changed cultural and societal dynamics (Khaddage et al., 2016; Merchant, 2012). The entire world is exposed to these new changes and societies have to go along with them (Merchant, 2012).

Developing countries, such as Costa Rica, have foreseen the assets that digital technology can bring to its society through education (MEP, 2016, 2018). The Ministry of Education of Costa Rica has been implementing Information Communication Technologies (ICT's) for more than two decades because of the benefits that technologies can bring to the citizens of the society

(MEP, 2016; MEP et al., 2017). The efforts that Costa Rican stakeholders have attempted to introduce new technologies in the curricula has marked a precedent across Latin America. Costa Rica has been recognized by its efforts to include mobile technologies at schools, where the limitation of resources is one of the main hardships (MEP et al., 2017).

Even though efforts have been made to equip Costa Rican schools with newer technologies, there is still a tremendous gap that should be narrowed to succeed and reach the expected educational goals. It is necessary to establish an effective channel of communication between stakeholders from the diverse educational contexts and higher authorities of the Ministry of Education of Costa Rica. The contradiction between the realities of what stakeholders expect teachers to accomplish in environments that need more support and attention is a deterrent to successfully lead the country to a more promising future.

The necessity to provide schools and teachers with the adequate resources and the professional training about different mobile technologies is imperative. The use of mobile devices as an instructional tool for the teaching and learning process in Costa Rican schools is highly beneficial, particularly in contexts where the teachers and students do not have appropriate didactical and technological resources. In fact, the participants from this study were aware of the benefits that mobile devices provide to their teaching and students' learning process, but they were also concerned about the negative consequences that they bring when not used appropriately. The mere use of a mobile device to enhance the teaching and learning process does not translate into an effective use and

educational outcome (Cochrane, 2014). The appropriate guidelines and curriculum to incorporate effective learning and teaching strategies for the students and teachers to use their own devices in the classroom is imperative (Ertmer & Ottenbreit-Leftwich, 2013, 2010).

Likewise, it is necessary take into consideration participants' experiences and recommendations to enrich the curriculum. Teachers' beliefs are essential to tailor and lead education into a more contextualized and realistic teaching practice (Ertmer 1999). Teachers' educational experiences can shape their behaviors and assumptions towards the way they perceive education should be (Ertmer 1999, 2005). If teachers have more negative experiences regarding the incorporation of technology in the classrooms, they will not likely to perceive it as beneficial as the traditional teaching practices (Ertmer, 2005). However, providing professional development to educators may be a determining factor that can change teachers' mindsets or perceptions about the implementation of technology. Nonetheless, this should be complemented with on-going professional development, follow-ups, and appropriate support for teachers to fulfill the established expectations.

The development of teachers' digital skills is necessary for them to navigate the constant changes of technology that occurs on a daily basis. Technology evolves rapidly and teachers should be aware of the technological changes that take place in the world. According to the participants, students' digital skills are more advanced than theirs, because they are constantly using their mobile devices and connected to the digital world. The Internet is a

window to the world's knowledge and youth are accessing to this information every day. In this case, education is shifting its traditional concept, where teachers were the main transmitters of knowledge into a more constructivist and student-center view. Students live in a realm of information at their fingertips, which compels teachers to change their role to a more pro-active facilitator of knowledge-construction. Teachers should lead students to construct more knowledge using technological devices under the light of humanists' tenets.

The necessity to raise awareness regarding the consequences of privacy violations and shaming in online spaces to young students is vital for students' well-being. Developing a curriculum where the integration of mobile technologies is not sufficient if it does not have the appropriate guidelines to safely navigate and interact within online spaces. Online privacy is still a phenomenon under discussion and that has not well-established parameters. Nonetheless, the reflective discussion and the incorporation of critical thinking skills should be in high demand inside the schools' classrooms, where teachers and students have the freedom to discuss the advantages and disadvantages of posts in social media or in a virtual space.

Another important implication is to raise consciousness about the students' dependency towards their mobile devices. Mobile devices have changed the traditional methods of communication and interaction, where face-to-face communication was once one of the main methods used by youth. Nowadays, young students are attached to their mobile devices; the obsession or addiction to these mobile devices has not been fully explored, but it is a

phenomenon that concerns teachers. In this case, the participants expressed the idea that their students want to be in constant communication through social media, sharing, and interacting with their peers.

In addition, the lack of students' self-regulation to use their mobile devices was a major concern of the participants in this study. The participants felt that this was more evident in younger students rather than students in higher levels. To learn how to control the use of mobile devices by students is an important aspect that teachers should instill in students. This aspect should be included in the curriculum and with the necessary measures to inform students and teachers about how to deal with the lack of regulation and control when using mobile devices in the on a daily basis.

Future research recommendations. Based on the findings of this study, it is important to conduct research with parents about how they control and measure the use of mobile devices with students at home. Parents play an important role in the students' lives and they are the main people responsible of students' developmental growth. The information obtained from this investigation could help to inform teachers and stakeholders about the different activities that students develop at home with their mobile devices and the way parents approach their children when using them.

Dependency on mobile devices by young students and self-regulation measures is another interesting area of research that should be taken into consideration for a future investigation. Findings suggested that participants were highly concerned by the constant need the students had to use their mobile

device. According to the participants in this study, this caused isolation and even dehumanization within the students. It would be important to develop and administer a survey about dependency toward mobile devices to teachers and students and make a cross-comparison of the studies.

Another interesting finding from the study is privacy violations and online shaming. This issue deeply concerned participants since some of them thought their privacy was being violated. The line between what is private and what should not be posted on an online space is still blurred. Students should be informed about this issue to avoid any legal dilemmas and prevent them from harming a person's image in public. Furthermore, it would be important to understand the social implications that memes represent; in this case, the pursuit of validation that people expect to receive when expressing a complaint or a message through a funny or thought-provoking image.

During this research, participants mentioned that their students used their mobile devices to communicate and organize different strikes around the country. This is an interesting issue that arose during the data collection and that is appealing for future research. The secondary students' strikes took place in July 2019, because they opposed the new educational reforms that Ministry of Education of Costa Rica adopted with the new elected government in 2018. Thus, during the strikes, students requested the resignation of the former Minister of Education, Edgar Mora, because they did not agree with his new educational policies. After several days of being on a strike and failed attempts of negotiation with the students, Edgar Mora resigned to be the Minister of

Education of Costa Rica. This event marked a new chapter in the sociopolitical history of Costa Rica and it also shed light on how students mobilized, and paralyzed a country through the use of their cell phones.

This situation was also related with youth empowerment by social media, which is potentially interesting parallel to study in light of the mobilization of youth through social media in order to achieve political change to gain better educational opportunities during the 2011 Arab Spring (Ghonim, 2012; Khalil, 2012; Mohamed, Gerber, & Aboulkacem, 2016). Nonetheless, it is important to take into consideration the way students criticize and filter the information they receive from social media. For instance, "fake news" that students consumed through social media and the influencers that also mediated in this situation, resulted in Edgar Mora resigning as the Minister of Education of Costa Rica.

Step: 13: Reformulating Research Questions

After revising the final thoughts and findings of the paper, I reviewed the research questions. I created a chart that contained the research questions to inform the findings of my dissertation and the revised questions.

Table 8

Research Questions and Revised Research Questions

Research Questions	Revised Research Questions
1. What are select Costa Rican secondary teachers' perceptions of their experiences regarding the incorporation of mobile devices in the classrooms?	1. What are select Costa Rican secondary teachers' positive and negative perceptions of using mobile devices with their students in the classrooms?
2. How do these perceptions of their experiences influence their likelihood of using mobile devices in the classrooms?	2. What are teachers' perceived challenges to successfully incorporate mobile devices in the classrooms?
3. How do these perceptions of their experiences influence their likelihood of banning (or not supporting) mobile devices in the classrooms?	3. How do these perceptions influence select Costa Rican teachers' beliefs when incorporating mobile devices in the classrooms?

Conclusion

In this Interpretive Phenomenological study, I sought to understand select Costa Rican secondary teachers' perceptions of their experiences when incorporating mobile devices in their teaching practices. My original interest in this research topic was triggered when one when of the participants from a book club that I held in Costa Rica asked me why they could not use their mobile device for reading the book. Since then, I undertook a quest to understand what secondary teachers thought about using mobile devices in their classes. This study shed light on the importance of teachers' perceptions regarding their teaching practices, and how these beliefs mediated their willingness to incorporate mobile devices in their classrooms.

Participants in this study presented mixed perceptions about the use of mobile devices; however, these perceptions were influenced by a series of external and internal factors explained in the discussion of the findings. To successfully incorporate mobile devices in the Costa Rican educational system, it is vital to have teachers become highly prepared in pedagogical methods that allow for the effective incorporation of mobile devices in diverse contexts. These diverse contexts including, but not limited to, where there is a lack of resources and support from stakeholders, but where the use of mobile devices by students is pervasive. This research provided interesting and relevant findings to take into consideration by stakeholders, teachers, students, parents, and community members at-large.

Summary

In Chapter VI, I provided the last steps of Leech and Onwuegbuzie (2010) Qualitative Framework. I described (a) Step 10: interpret data; (b) Step 11: validation/legitimation of data; (c) Step 12: write the qualitative research report; and (d) Step 13: reformulate the research questions. I also discussed the final implications and future research recommendations.

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APPENDIX A
Letter of Authorization from Luna Blanca High School's Principal

Liberia, Costa Rica, 11 de febrero del 2019

Sra:
M.Ed. Ana Marcela Montenegro Sánchez
Graduate Student Research/ Teaching Assistant
The School of Teaching and Learning
Sam Houston State University

[   ] Costa Rica High School, hereby authorize Ana Marcela Montenegro to collect data for her dissertation about **Selected Secondary Costa Rican Teachers' Perceptions Regarding the Incorporation of Mobile Devices in the Curricula**. This authorization permits Ms. Montenegro to contact and interview twelve Secondary School teachers from the [   ] High School. These interviews will assist Ms. Montenegro's Dissertation Research leading to her Doctorate in Education and Literacy. Myself and my administration are in know that Ms. Montenegro will be contacting the teachers and interviewing them. If you have any questions regarding this authorization, please contact my office at the following phone [   ] or the the following email address: [   ]

Regards,

"Educar para una nueva soberanía"
Orgullosos de ser Guanacasteco

APPENDIX B

IRB Approved Consent Letter for Participant in Spanish

Sam Houston State University
Consentimiento para la Participación en la Investigación

INFORMACIÓN CLAVE PARA: PERCEPCIONES DE PROFESORES SELECTOS COSTARRICENSES DE SECUNDARIA ACERCA DEL USO DEL APRENDIZAJE MÓVIL EN SUS PRÁCTICAS DE ENSEÑANZA

Se le está solicitando ser un participante en un estudio de investigación sobre las percepciones de los profesores de enseñanza secundaria de Costa Rica sobre el aprendizaje móvil en sus prácticas de enseñanza. Se le ha pedido que participe en este estudio porque la información que usted proporcionará es relevante para entender cómo los profesores de la asignatura de Español han percibido e incorporado el aprendizaje móvil en sus prácticas de enseñanza. Por lo tanto usted tiene la posibilidad de participar en este estudio.

¿CUÁL ES EL PROPÓSITO, PROCEDIMIENTO Y DURACIÓN DEL ESTUDIO?

El propósito de esta investigación es para conocer las percepciones de los profesores de la asignatura de Español de secundaria costarricense sobre el aprendizaje móvil en sus prácticas de enseñanza. Esto ayudaría a brindar un mayor entendimiento de lo que han experimentado los profesores de la asignatura de Español con respecto a las tecnologías digitales y cómo han utilizado el aprendizaje móvil en su enseñanza. Su participación en este estudio será solamente una entrevista que durará aproximadamente sesenta minutos.

¿CUÁLES SON LAS RAZONES POR LAS CUÁLES USTED PUEDE ELEGIR PARTICIPAR VOLUNTARIAMENTE EN ESTE ESTUDIO?

La razón por la cual usted podría participar en este estudio es para obtener un conocimiento más afondo acerca de las prácticas móviles en su práctica de enseñanza. Asimismo, usted podrá dar información valiosa para los estudios que se están realizando acerca de la enseñanzas móvil en los colegios de secundaria de América Latina.

¿CUÁLES SON LAS RAZONES POR LAS CUÁLES USTED NO DESEARÍA PARTICIPAR VOLUNTARIAMENTE EN ESTE ESTUDIO?
Algunas de las preguntas pueden provocarle cierta confusión o incomodidad durante la entrevista, ya que compartirá sus opiniones y percepciones. Usted tiene la opción de retirarse de la investigación en cualquier momento; así como de no responder a cualquiera de las preguntas durante el proceso de la entrevista, si así lo desea.

¿USTED TIENE QUE FORMAR PARTE DE ESTE ESTUDIO?

Si usted decide formar parte de este estudio, esto sería porque usted realmente quiere participar voluntariamente y dar su información. Usted no perderá ningún de sus beneficios, servicios o derechos que usted normalmente ha tenido si usted no desea participar en esta investigación.

¿QUÉ TAL SI TENGO PREGUNTAS, SUGERENCIAS O DUDAS?

Los investigadora a cargo de este estudio es Ana Marcela Montenegro Sánchez de Sam Houston State University de La Escuela de Enseñanza y Aprendizaje, quien está bajo la supervisión de la Dra. Hannah

R. Gerber, Ph.D. Profesora Asociada de Alfabetismo en Sam Houston State University. Si usted tiene preguntas, sugerencias o dudas acerca de este estudio, o si usted decide salirse del mismo, la información de contacto de la investigadora principal es
Teléfono móvil: 936587490
Correo electrónico: amm179@shsu.edu
Supervisora de disertación: Dra. Hannah R. Gerber
Teléfono de oficina: (936) 294.3864
Correo electrónico: hrg004@shsu.edu
Si usted tiene alguna pregunta, sugerencia o duda acerca de sus derechos como voluntario de su participación en este estudio, por favor contante a la oficina de Investigación y Programas Sharla Miles al teléfono 936-294-4875 o al correo electrónico: sharla_miles@shsu.edu.

Sam Houston State University
Consentimiento para la Participación en la Investigación

CONSENTIMIENTO DETALLADO
PERCEPCIONES DE PROFESORES SELECTOS COSTARRICENSES DE SECUNDARIA ACERCA DEL USO DEL APRENDIZAJE MÓVIL EN SUS PRÁCTICAS DE ENSEÑANZA

Informe de Consentimiento

Mi nombre es Ana Marcela Montenegro Sánchez. Soy estudiante de doctorado del Programa de Alfabetismo en la Escuela de Enseñanza y Aprendizaje, de la Universidad de Sam Houston State. Me gustaría aprovechar esta oportunidad para invitarlo a participar en un estudio de investigación acerca de las "Percepciones de Maestros Costarricenses Selectos de Secundaria acerca del Aprendizaje Móvil en sus Prácticas de Enseñanza." Estoy realizando esta investigación bajo la supervisión de Hannah R. Gerber, Ph.D., Profesora Asociada de la Escuela de Enseñanza y Aprendizaje de la Universidad de Sam Houston State. Espero que los datos de esta investigación proporcionen más información acerca de las experiencias de los profesores de la asignatura de Español de secundaria, sobre el uso de dispositivos móviles en su práctica docente. Se le ha solicitado que participe en la investigación porque la información que usted proporcionará es relevante para entender como los profesores de la asignatura de Español de secundaria han percibido el aprendizaje móvil en su práctica de enseñanza. Los resultados de este estudio cualitativo podrán proveer más conocimiento acerca de cómo los profesores de la asignatura de Español han integrado el aprendizaje móvil en su mediación pedagógica.

La investigación es relativamente sencilla, y no esperamos que la investigación ponga en riesgo ninguno de los participantes que voluntariamente desean participar en este estudio. Si acepta participar en esta investigación, se le pedirá que responda diferentes preguntas sobre sus percepciones y experiencias relacionadas con la incorporación del aprendizaje móvil en su prácticas de enseñanza. Cualquier información que usted nos brinde, será para mi disertación y las futuras publicaciones que estarán dirigidas a los profesores y los capacitadores de los profesores. Bajo ninguna circunstancia será identificado usted o cualquier otro participante que este en esta investigación. Además, sus datos serán confidenciales y se le asignará un pseudónimo.

Esta entrevista requiere sesenta minutos de su tiempo. A usted no se le dará una bonificación de dinero por realizarla. En esta entrevista, usaré un dispositivo de grabación de audio digital. Usted tendrá el derecho de revisar la grabación de audio y hacer cambios si usted piensa que las transcripciones tienen alguna incoherencia con lo que usted expresó durante la entrevista. Además, a usted se le informará cuando las grabaciones de audio serán destruidas.

Su participación en esta investigación es voluntaria. Si usted no decide participar esto no implicará ninguna sanción o pérdida de los beneficios a los que usted tiene derecho. Usted puede interrumpir su participación en cualquier momento sin penalización o pérdida de los beneficios con los que usted cuenta y tiene derecho. Si tiene alguna duda, no dude en comunicarse con alguno de los números que aparecen abajo. Usted puede utilizar la información de contacto que se a continuación se le brinda. Si está interesado, los resultados de este estudio estarán disponibles al final del proyecto.

Si tiene alguna pregunta sobre esta investigación, no dude en comunicarse conmigo, Ana Marcela Montenegro Sánchez o Dr. Hanna R. Gerber, Ph. D. Si tiene preguntas o inquietudes sobre sus derechos como participante de la investigación, comuníquese con Sharla Miles, Oficina de Investigación y Programas Patrocinados, utilizando su información de contacto a continuación.

M.Ed. Ana Marcela Montenegro S. The School of Teaching and Learning Sam Houston State University Huntsville, TX 77341 Phone: (936) 581 7490 E-mail: amm179@shsu.edu	*Ph.D. Hannah R. Gerber.* The School of Teaching and Learning Sam Houston State University Huntsville, TX 77341 Phone: (936) 294.3864 E-mail: hrg004@shsu.edu	Sharla Miles Office of Research and Sponsored Programs Sam Houston State University Huntsville, TX 77341 Phone: (936) 294-4875 Email: irb@shsu.edu

☐   Entiendo lo anterior y doy mi consentimiento para participar.

☐   No deseo participar en el estudio actual.

CONSENTIMIENDO DE GRABACION DE AUDIO DURANTE LA ENTREVISTA

Como parte de este proyecto, se realizará una grabación de audio durante su participación en esta investigación, solamente con el propósito de realizar la transcripción. Esto es completamente voluntario. Si se utiliza la grabación, su nombre no será identificado. Usted puede revisar las grabaciones de audio a su conveniencia. Yo le informaré cuando estas grabaciones serán destruidas. También, usted puede solicitar que su grabación se detenga en cualquier momento de la entrevista o borrar algún segmento de la misma si así lo desea.

☐   Yo estoy de acuerdo en participar en la grabación de audio durante la entrevista.

☐   Yo no deseo participar en ninguna grabación de audio durante la entrevista.

APPENDIX C
Consent Form Letter for Participant in English

Sam Houston State University
Consent for Participation in Research

KEY INFORMATION FOR: SELECT SECONDARY COSTA RICAN TEACHERS' PERCEPTIONS ABOUT MOBILE LEARNING IN THEIR TEACHING PRACTICES

You are being asked to be a participant in a research study about Select Secondary Costa Rican Teachers' Perceptions about Mobile Learning in their Teaching Practices. You have been asked to participate in the research because the information that you will provide is relevant to understand how secondary teachers of Spanish literature have perceived and incorporated mobile learning in their teaching practices. Therefore, you may be eligible to participate.

WHAT IS THE PURPOSE, PROCEDURES, AND DURATION OF THE STUDY?

By doing this study, we hope to learn the perceptions of Costa Rican secondary Spanish literature teachers about mobile learning in their teaching practices. This would help to increase awareness of what secondary Spanish literature teachers have experienced and how they have used mobile learning in their teaching instruction. Your participation in this research will be only one sixty-minute session.

WHAT ARE REASONS YOU MIGHT CHOOSE TO VOLUNTEER FOR THIS STUDY?

By participating in this study, you will get more insights regarding mobile learning in your teaching practices and provide valuable information to the increasing body of research regarding mobile learning practices in secondary schools of Latin America.

WHAT ARE REASONS YOU MIGHT CHOOSE NOT TO VOLUNTEER FOR THIS STUDY?

Some of the questions might make you feel you somehow confused and discomfort before or meanwhile you are providing information about your teaching past experiences or educational policies' information. You have the option to withdraw from the research at any time of the interview process or the option to not answer the question.

DO YOU HAVE TO TAKE PART IN THE STUDY?

If you decide to take part in the study, it should be because you really want to volunteer and provide your information. You will not lose any services, benefits, or rights you would normally have if you choose not to volunteer.

Consent Form

WHAT IF YOU HAVE QUESTIONS, SUGGESTIONS OR CONCERNS?

The person in charge of this study is Ana Marcela Montenegro Sánchez of the Sam Houston State University from The School of Teaching and Learning, who is working under the supervision of Dr. Hannah R. Geber, Ph.D., Associate Professor of Literacy at Sam Houston State University. If you have questions, suggestions, or concerns regarding this study or you want to withdraw from the study his/her contact information is: Ana Marcela Montenegro Sánchez. Phone number: 936-581-7490. Email: amm179@shsu.edu.
Faculty supervisor: Dr. Hannah R. Gerber; office's phone number: (936) 294.3864. Email: hrg004@shsu.edu.
If you have any questions, suggestions or concerns about your rights as a volunteer in this research, contact the Office of Research and Sponsored Programs – Sharla Miles at 936-294-4875 or e-mail ORSP at sharla_miles@shsu.edu.

IRB-2019-37/April 8, 2019/--.

Sam Houston State University

Consent for Participation in Research

DETAILED CONSENT SELECT COSTA RICAN SECONDARY TEACHERS' PERCEPTIONS ABOUT MOBILE LEARNING IN THEIR TEACHING PRACTICES

Informed Consent

My name is Ana Marcela Montenegro Sánchez and I am a doctoral student in the Literacy Doctoral program in the School of Teaching and Learning, College of Education at Sam Houston State University. I would like to take this opportunity to invite you to participate in a research study of Select Secondary Costa Rican Teachers' Perceptions about Mobile Learning in their Teaching Practices. I am conducting this research under the direction of Dr. Hannah R. Gerber, Ph. D., Associate Professor of Literacy. I hope that data from this research will provide insights about the perceptions of secondary Spanish literature teachers about incorporation of mobile learning in their teaching practices. You have been asked to participate in the research because the information you will provide is relevant to understand how secondary teachers of Spanish literature have perceived and incorporated mobile learning in their teaching practices. The findings of this qualitative study can increase awareness of what secondary Spanish literature teachers have experienced when using mobile learning practices in their teaching practices.

The research is relatively straightforward, and we do not expect the research to pose any risk to any of the volunteer participants. If you consent to participate in this research, you will be asked to answer different questions regarding your perceptions about mobile learning in your teaching practices. You do not have to answer any questions if you do not want to answer them and you can withdraw from the study at any time. Any data obtained from you will only be used for the purpose of my dissertation research and future publications for teachers and teacher educators. Under no circumstances will you or any other participants who participated in this research be identified. In addition, your data will remain confidential.

This research will require about sixty minutes of your time. Participants will not be paid or otherwise compensated for their participation in this project. You will be audio recorded. You have the right to review your recording and correct it if you find any incongruences with the information you provided and the transcripts. The destruction of the recording will be in no longer than three years.

Your participation in this research is voluntary. Your decision whether or not to participate will involve no penalty or loss of benefits to which the subject is otherwise entitled, and the subject may discontinue

participation at any time without penalty or loss of benefits to which the subject is otherwise entitled. If you have any questions, please feel free to ask me using the contact information below. If you are interested, the results of this study will be available at the conclusion of the project.

   If you have any questions about this research, please feel free to contact me, Ana Marcela Montenegro Sánchez or Dr. Hannah R. Gerber, Ph. D. If you have questions or concerns about your rights as research participants, please contact Sharla Miles, Office of Research and Sponsored Programs, using her contact information below.

| *Ana Marcela Montenegro S. M.Ed.* The School of Teaching and Learning Sam Houston State University Huntsville, TX 77341 Phone: (936) 581 7490 E-mail: amm179@shsu.edu | *Hannah R. Gerber. Ph.D.* The School of Teaching and Learning Sam Houston State University Huntsville, TX 77341 Phone: (936) 294.3864 E-mail: hrg004@shsu.edu | Sharla Miles Office of Research and Sponsored Programs Sam Houston State University Huntsville, TX 77341 Phone: (936) 294-4875 Email: irb@shsu.edu |

☐ I understand the above and consent to participate.

☐ I do not wish to participate in the study.

AUDIO/VIDEO RECORDING RELEASE CONSENT

As part of this project, an audio/video recording will be made of you during your participation in this research project for transcription purposes only. This is completely voluntary. In any use of the audio/video recording, your name will not be identified. You can review the recordings at your convenience and I will inform you when the recordings will be destroyed. You may request to stop the recording at any time or to erase any portion of your recording.

☐ I consent to participate in the audio/video recording activities.

☐ I do not wish to participate in the audio/video recording activities.

APPENDIX D
Detailed Consent Form from IRB in English

Sam Houston State University
Consent for Participation in Research

KEY INFORMATION FOR: SELECT SECONDARY COSTA RICAN TEACHERS' PERCEPTIONS ABOUT MOBILE LEARNING IN THEIR TEACHING PRACTICES

You are being asked to be a participant in a research study about Select Secondary Costa Rican Teachers' Perceptions about Mobile Learning in their Teaching Practices. You have been asked to participate in the research because the information that you will provide is relevant to understand how secondary teachers of Spanish literature have perceived and incorporated mobile learning in their teaching practices. Therefore, you may be eligible to participate.

WHAT IS THE PURPOSE, PROCEDURES, AND DURATION OF THE STUDY?

By doing this study, we hope to learn the perceptions of Costa Rican secondary Spanish literature teachers about mobile learning in their teaching practices. This would help to increase awareness of what secondary Spanish literature teachers have experienced and how they have used mobile learning in their teaching instruction. Your participation in this research will last one sixty-minute session.

WHAT ARE REASONS YOU MIGHT CHOOSE TO VOLUNTEER FOR THIS STUDY?

By participating in this study, you will get more insights regarding mobile learning in your teaching practices and provide valuable information to the increasing body of research regarding mobile learning practices in secondary schools of Latin America.

WHAT ARE REASONS YOU MIGHT CHOOSE NOT TO VOLUNTEER FOR THIS STUDY?
Some of the questions might make you feel you somehow confused and discomfort before or meanwhile you are providing information about your teaching past experiences or educational policies' information. You have the option to withdraw from the research at any time of the interview process or the option to not answer the question.

DO YOU HAVE TO TAKE PART IN THE STUDY?
If you decide to take part in the study, it should be because you really want to volunteer and provide your information. You will not lose any services, benefits, or rights you would normally have if you choose not to volunteer.

WHAT IF YOU HAVE QUESTIONS, SUGGESTIONS OR CONCERNS?
The person in charge of this study is Ana Marcela Montenegro Sánchez of the Sam Houston State University Department of the School of Teaching and Learning who is working under the supervision of Dr. Hannah R. Geber, Ph.D., Associate Professor of Literacy at Sam Houston State University. If you have questions, suggestions, or concerns regarding this study or you want to withdraw from the study his/her contact information is: Ana Marcela Montenegro Sánchez. Phone number: 936-581-7490. Email: amm179@shsu.edu. Faculty supervisor: Dr. Hannah R. Geber; office's phone number: (936) 294.3864. Email: hrg004@shsu.edu.

IRB-2019-37/April 8, 2019/--.

If you have any questions, suggestions or concerns about your rights as a volunteer in this research, contact the Office of Research and Sponsored Programs – Sharla Miles at 936-294-4875 or e-mail ORSP at sharla_miles@shsu.edu.

Consent Form

Sam Houston State University

Consent for Participation in Research

DETAILED CONSENT

Select Costa Rican Teachers' Perceptions about Mobile Learning in their Teaching Practices

Why am I being asked?

You are being asked to be a participant in a research study about select Costa Rican teachers' perceptions about mobile learning in their teaching practices conducted by Ana Marcela Montenegro Sánchez of the School of Teaching and Learning from the College of Education at Sam Houston State University. I am conducting this research under the direction of Dr. Hannah R. Gerber, Ph.D., Associate Professor of Literacy at Sam Houston State University. You have been asked to participate in the research because the information that you will provide is relevant to understand how secondary teachers of Spanish literature have perceived and incorporated mobile learning in their teaching practices and may be eligible to participate. We ask that you read this form and ask any questions you may have before agreeing to be in the research. Your participation in this research is voluntary. Your decision whether or not to participate will involve no penalty or loss of benefits to which the subject is otherwise entitled, and the subject may discontinue participation at any time without penalty or loss of benefits to which the subject is otherwise entitled.

Why is this research being done?

The purpose of this research is to understand the perceptions of select Costa Rican secondary Spanish literature teachers about mobile learning in their teaching practices. This would help to increase awareness of what secondary Spanish literature teachers have experienced and how they have used mobile learning in their teaching instruction. Additionally, this would provide valuable information to the increasing body of research regarding mobile learning practices in secondary schools of Latin America. If you consent to participate in this research, you will be asked to answer interview questions regarding your perceptions about mobile learning in your teaching practices. You do not have to answer any questions if you do not want to answer them and you can withdraw from the study at any time.

What is the purpose of this research?

The purpose of this research is:
To explore the Costa Rican secondary teachers' perceptions about mobile learning in their teaching practices. The sub-questions of this research are addressed to get an in-depth insight if Spanish literature teachers' perceptions may influence the likelihood of using mobile learning in their teaching practice.

Consent Form

What procedures are involved?

If you agree to be in this research, we would ask you to do the following things:

You will be interviewed and the duration of the initial interview will be 60 minutes. After the interviews have been transcribed, I will use Zoom (an end-to-end encrypted video conferencing platform for more security) to conduct a member checking protocol with you. I will provide the transcript of the interview through the same platform and allow you to correct any incorrect items as well as redact anything that you do not wish to have stated in the interview transcript. The recordings will be password protected for more security.
Approximately 10 to 12 participants may be involved in this research at Sam Houston State University.

What are the potential risks and discomforts?

Some of the questions might make you feel you somehow confused and discomfort before or meanwhile you are providing information about your teaching past experiences or educational policies' information. You have the option to withdraw from the research at any time of the interview process or the option to not answer the question.

Are there benefits to taking part in the research?

In this research there are not expected benefits nor any payment or compensation for your participation.

What other options are there?

You also have the option to be interviewed via Zoom video conferencing software at a time and place of your convenience.

What about privacy and confidentiality?

The only people who will know that you are a research participant are members of the research team. No information about you, or provided by you, during the research will be disclosed to others without your written permission, except:
- if necessary to protect your rights or welfare (for example, if you are injured and need emergency care or when the SHSU Protection of Human Subjects monitors the research or consent process); or
- if required by law.

When the results of the research are published or discussed in conferences, no information will be included that would reveal your identity. If photographs, videos, or audiotape recordings of you will be used for educational purposes, your identity will be protected or disguised.
Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law.
As previously stated, you will have the right to check your transcripts of the interview, and correct any incorrect items, as well as redact anything that you do not wish to have stated in the

Consent Form

interview transcript. The records will be destroyed, in no longer than three years of being recorded.

What if I am injured as a result of my participation?

In the event of injury related to this research study, you should contact your physician or the University Health Center. However, you or your third-party payer, if any, will be responsible for payment of this treatment. There is no compensation and/or payment for medical treatment from Sam Houston State University for any injury you have from participating in this research, except as may by required of the University by law. If you feel you have been injured, you may contact the researcher, Ana Marcela Montenegro Sánchez; phone number: (936)581 7490.

What are the costs for participating in this research?

There are not any costs to participate in this research

Will I be reimbursed for any of my expenses or paid for my participation in this research?

You will not be reimbursed or paid for any participation in this research.

Can I withdraw or be removed from the study?

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you do not want to answer and remain in the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so.
There are no possible consequences if you decide not to participate in the research.

Who should I contact if I have questions?

The researchers conducting this study are:
Principal investigator: Ana Marcela Montenegro Sánchez;
Dissertation Advisor: Dr. Hannah R. Gerber;
Person in charge of research and sponsored programs at SHSU: Sharla Miles.
You may ask any questions you have now. If you have questions later, you may contact the researchers at:
Ana Marcela's phone's number: (936) 581 7490
Dr. Hannah R. Gerber's office phone number: (936) 294.3864
Sharla Miles's office phone number: (936) 294-4875

What are my rights as a research subject?

If you feel you have not been treated according to the descriptions in this form, or you have any questions about your rights as a research participant, you may call the Office of Research and Sponsored Programs – Sharla Miles at 936-294-4875 or e-mail ORSP at sharla_miles@shsu.edu.

Consent Form

You may choose not to participate or to stop your participation in this research at any time. Your decision whether or not to participate will involve no penalty or loss of benefits to which the subject is otherwise entitled, and the subject may discontinue participation at any time without penalty or loss of benefits to which the subject is otherwise entitled.

You will not be offered or receive any special consideration if you participate in this research.

<u>Agreement to Participate</u>

I have read the above information. I have been given an opportunity to ask questions and my questions have been answered to my satisfaction. I agree to participate in this research.

Consent: I have read and understand the above information, and I willingly consent to participate in this study. I understand that if I should have any questions about my rights as a research subject, I can contact Ana Marcela Montenegro Sánchez at 936-581-7490 or by email at amm179@shsu.edu . I have received a copy of this consent form.

Your name (printed):_____

Signature: _____ Date: _____

APPENDIX E
Detailed Consent Form in Spanish

Sam Houston State University
Consentimiento para la Participación en la Investigación

INFORMACIÓN CLAVE PARA: PERCEPCIONES DE PROFESORES SELECTOS COSTARRICENSES DE SECUNDARIA ACERCA DEL USO DEL APRENDIZAJE MÓVIL EN SUS PRÁCTICAS DE ENSEÑANZA

Se le está solicitando ser un participante en un estudio de investigación sobre las percepciones de los profesores de enseñanza secundaria de Costa Rica sobre el aprendizaje móvil en sus prácticas de enseñanza. Se le ha pedido que participe en este estudio porque la información que usted proporcionará es relevante para entender cómo los profesores de la asignatura de Español han percibido e incorporado el aprendizaje móvil en sus prácticas de enseñanza. Por lo tanto usted tiene la posibilidad de participar en este estudio.

¿CUÁL ES EL PROPÓSITO, PROCEDIMIENTO Y DURACIÓN DEL ESTUDIO?

El propósito de esta investigación es para conocer las percepciones de los profesores de la asignatura de Español de secundaria costarricense sobre el aprendizaje móvil en sus prácticas de enseñanza. Esto ayudaría a brindar un mayor entendimiento de lo que han experimentado los profesores de la asignatura de Español con respecto a las tecnologías digitales y cómo han utilizado el aprendizaje móvil en su enseñanza. Su participación en este estudio será solamente una entrevista que durará aproximadamente sesenta minutos.

¿CUÁLES SON LAS RAZONES POR LAS CUÁLES USTED PUEDE ELEGIR PARTICIPAR VOLUNTARIAMENTE EN ESTE ESTUDIO?

La razón por la cual usted podría participar en este estudio es para obtener un conocimiento más afondo acerca de las prácticas móviles en su práctica de enseñanza. Asimismo, usted podrá dar información valiosa para los estudios que se están realizando acerca de la enseñanzas móvil en los colegios de secundaria de América Latina.

¿CUÁLES SON LAS RAZONES POR LAS CUÁLES USTED NO DESEARÍA PARTICIPAR VOLUNTARIAMENTE EN ESTE ESTUDIO?

Algunas de las preguntas pueden provocarle cierta confusión o incomodidad durante la entrevista, ya que compartirá sus opiniones y percepciones. Usted tiene la opción de retirarse de la investigación en cualquier momento; así como de no responder a cualquiera de las preguntas durante el proceso de la entrevista, si así lo desea.

IRB-2019-37/April 8, 2019/--.

¿USTED TIENE QUE FORMAR PARTE DE ESTE ESTUDIO?

Si usted decide formar parte de este estudio, esto sería porque usted realmente quiere participar voluntariamente y dar su información. Usted no perderá ningún de sus beneficios, servicios o derechos que usted normalmente ha tenido si usted no desea participar en esta investigación.

¿QUÉ TAL SI TENGO PREGUNTAS, SUGERENCIAS O DUDAS?

Los investigadora a cargo de este estudio es Ana Marcela Montenegro Sánchez de Sam Houston State University de La Escuela de Enseñanza y Aprendizaje, quien está bajo la supervisión de la Dra. Hannah R. Gerber, Ph.D. Profesora Asociada de Alfabetismo en Sam Houston State University. Si usted tiene preguntas, sugerencias o dudas acerca de este estudio, o si usted decide salirse del mismo, la información de contacto de la investigadora principal es
Teléfono móvil: 936587490
Correo electrónico: amm179@shsu.edu
Supervisora de disertación: Dra. Hannah R. Gerber
Teléfono de oficina: (936) 294.3864
Correo electrónico: hrg004@shsu.edu
Si usted tiene alguna pregunta, sugerencia o duda acerca de sus derechos como voluntario de su participación en este estudio, por favor contante a la oficina de Investigación y Programas Sharla Miles al teléfono 936-294-4875 o al correo electrónico: sharla_miles@shsu.edu.

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Sam Houston State University

Consentimiento de Participación en la Investigación

CONSENTIMIENTO DETALLADO

Percepciones de Profesores Selectos Costarricenses de Secundaria acerca del Aprendizaje Móvil en sus Prácticas de Enseñanza

</div>

¿Por qué se me está preguntando?

Se le está solicitando su participación en un estudio de investigación sobre las percepciones de los profesores de enseñanza secundaria de Costa Rica sobre el aprendizaje móvil en sus prácticas de enseñanza, dirigido por Ana Marcela Montenegro Sánchez, estudiante de doctorado en alfabetización de la Universidad Estatal de Sam Houston. Esta investigación se está realizando bajo la dirección de la Dra. Hannah R. Gerber, Ph. D., Profesora Asociada del posgrado de Alfabetización. Se le ha pedido que participe en este estudio porque la información que usted proporcionará es relevante para entender cómo los profesores de la asignatura de Español han percibido e incorporado el aprendizaje móvil en sus prácticas de enseñanza. Se le solicita que lea este formulario y haga cualquier pregunta que pueda tener antes de aceptar ser parte de esta investigación.

Su participación en esta estudio es voluntaria. Su decisión de participar o no, no tendrá ninguna sanción o pérdida de los benefícios a los que tiene usted ya tiene derecho; también, puede interrumpir su participación en cualquier momento sin penalización o pérdida de los beneficios a los que tiene derecho.

¿Por qué se está haciendo esta investigación?

El propósito de esta investigación es para conocer las percepciones de los profesores de la asignatura de Español de secundaria costarricense sobre el aprendizaje móvil en sus prácticas de enseñanza. Esto ayudaría a brindar un mayor entendimiento de lo que han experimentado los profesores de la asignatura de Español con respecto a las tecnologías digitales y cómo han utilizado el aprendizaje móvil en su enseñanza. Asimismo, esta información aportará a las investigaciones que se están realizando acerca de las prácticas de enseñanza móvil en los colegios de secundaria de América Latina. Si acepta participar en esta investigación, se le pedirá que responda preguntas de la entrevista sobre sus percepciones sobre el aprendizaje móvil en sus prácticas de enseñanza. Usted tiene la opción de no responder a ninguna pregunta si así lo desea y puede retirarse del estudio en cualquier momento.

¿Cuál es el propósito de esta investigación?

La pregunta de investigación de este estudio es conocer las percepciones de los profesores de secundaria de la asignatura de Español de Costa Rica acerca del aprendizaje móvil

en sus prácticas de enseñanza. También se le preguntará si sus percepciones pueden influir en la probabilidad de utilizar la enseñanza móvil en su práctica docente o no.

¿Qué procedimientos están involucrados?

La duración de la entrevista inicial será de 60 minutos. Después de que las entrevistas hayan sido transcritas, yo utilizaré Zoom (una plataforma de videoconferencia cifrada de extremo a extremo para brindar mayor seguridad) para realizar un protocolo de verificación con el participante, en donde se verificará la información proporcionada durante la entrevista. Durante esta verificación, yo le brindaré la transcripción a través de Zoom y le permitiré corregir cualquier error que usted haya notado. Por ejemplo, el uso de artículos, así como la redacción de cualquier información que usted no desee que se indique en la transcripción de la entrevista. Los audios de las entrevistas estarán protegidos con una clave de seguridad para mayor seguridad.

El número aproximado de participantes que se espera coopere en este estudio es de 10 a 12 dentro de la institución en donde usted labora.

¿Cuáles son los riesgos e inconformidades que se puedan presentar?

Algunas de las preguntas pueden provocarle cierta confusión o incomodidad durante la entrevista, ya que compartirá opiniones y percepciones personales. Usted tiene la opción de retirarse de la investigación en cualquier momento; así como de no responder a cualquiera de las preguntas durante el proceso de la entrevista si así lo desea.

¿Hay beneficios por participar en la investigación?

En esta investigación usted no se cuenta con algún beneficio o recompensa económica por su participación.

¿Qué otras opciones hay?

Usted también tiene la opción de ser entrevistado a través del software de videoconferencia Zoom en el momento y lugar que usted así lo desee.

¿Qué hay en cuanto a la privacidad y la confidencialidad?

Las únicas personas que sabrán que usted es un participante de la investigación son los miembros del equipo de la investigación. Durante esta investigación, ninguna información sobre usted o proporcionada por usted, se divulgará a otros sin su permiso por escrito, con excepción de los siguientes casos:
- si es necesario para proteger sus derechos o bienestar (por ejemplo, si está lesionado y necesita atención de emergencia o cuando la Protección de Sujetos a Humanos de SHSU supervisa el proceso de investigación o consentimiento); o
- si así lo exige la ley.

Cuando los resultados de la investigación se publiquen o se presenten en alguna conferencia, no se incluirá información que revele su identidad. Si hay fotografías, videos o grabaciones en algún audio acerca de usted, se utilizarán con fines educativos solamente. En este caso, su identidad estará protegida o estará codificada con un seudónimo.

Cualquier información que se obtenga en relación con este estudio y que pueda identificarse con usted permanecerá confidencial y se divulgará solo con su permiso o según lo exija la ley. Asimismo, como se expuso con anterioridad, usted tendrá el derecho de chequear las transcripciones de la entrevista y corregir cualquier error que usted note, así como la redacción de cualquier información que usted no desee que se indique en la transcripción de la entrevista. Las grabaciones serán destruidas en un lapso no mayor de tres años después de que hayan sido grabadas.

¿Qué pasa si sufro de alguna lesión como resultado de mi participación?

En caso de lesiones relacionadas con este estudio de investigación, debe comunicarse con su médico o con el Centro de Salud al que pertenece. Sin embargo, usted o su patrono, si así lo corresponde, serán responsables del pago de este tratamiento. No hay compensación y / o pago por el tratamiento médico de Sam Houston State University por cualquier lesión que tenga por participar en esta investigación, excepto según lo exija la ley de la Universidad. Si siente que ha sido lesionado, puede comunicarse con la investigadora, Ana Marcela Montenegro Sánchez al número de teléfono: (936) 581 7490.

¿Cuáles son los costos por participar en esta investigación?

No hay ningún costo por su participación en esta investigación.

¿Se me reembolsará alguno de mis gastos o se me pagará por mi participación en esta investigación?

No se le reembolsará ni pagará por su participación en esta investigación.

¿Puedo retirarme o retirarme del estudio?

Usted puede elegir si quiere participar en este estudio o no. Si usted se ofrece como voluntario para participar en este estudio, puede retirarse en cualquier momento sin sufrir alguna consecuencia de ningún tipo. También puede negarse a responder cualquier pregunta que no desee responder y a permanecer en el estudio. Asimismo, la investigadora puede excluirlo de esta investigación si surge alguna circunstancia que lo así lo justifique.

No hay consecuencias posibles si usted decide participar o no en esta investigación.

¿A quién debo contactar si tengo preguntas?

Los investigadores que realizan este estudio son:

Investigador principal: Ana Marcela Montenegro Sánchez;

Asesora de disertación: Dra. Hannah R. Gerber;

Responsable de investigación y programas patrocinados en SHSU: Sharla Miles.

Usted puede hacer cualquier pregunta que tenga en este momento. Si eventualmente usted tiene más preguntas puede contactar a los investigadores a los siguientes números de teléfono:

Número de teléfono de Ana Marcela Montenegro Sánchez: (936) 581 7490.

Teléfono de la oficina de la doctora Hannah R. Gerber: (936) 294.3864

Número de teléfono de la oficina de Sharla Miles: (936) 294-4875

¿Cuáles son mis derechos como participante de esta investigación?

      Si siente que no ha sido tratado de acuerdo con las descripciones de este formulario, o si tiene alguna pregunta sobre sus derechos como participante de esta investigación, puede llamar a la Oficina de Investigación y Programas Patrocinados - Sharla Miles al (936) 294-4875 o envíe un correo electrónico a ORSP a sharla_miles@shsu.edu.

      Usted tiene la opción de participar o suspender su participación en esta investigación en cualquier momento si usted así lo desea. Su decisión de participar o no en este estudio no le implicará alguna sanción o pérdida de los beneficios a los que usted ya tiene derecho. Usted puede interrumpir la participación en cualquier momento sin penalización o pérdida de los beneficios a los que usted ya tiene derecho.

También, no se le ofrecerá o recibirá ninguna consideración especial si participa en esta investigación.

Acuerdo de participación

Yo he leído la información anterior. Se me ha dado la oportunidad de hacer preguntas y mis preguntas han sido respondidas satisfactoriamente. Estoy de acuerdo en participar en esta investigación.

Consentimiento: Yo he leído y he entendido la información anterior. Yo de una forma voluntaria consiento en participar en este estudio. Además, yo entiendo que si tengo alguna pregunta sobre mis derechos como participante de esta investigación, puedo comunicarme con Ana Marcela Montenegro Sánchez al número de celular (936) 5817490 o por correo electrónico a: amm179@shsu.edu. Asimismo, yo también he recibido una copia de este formulario de consentimiento.

Su nombre (impreso): _____

Fecha de firma: _____

APPENDIX F
Interview Protocol in English

<mark>IRB</mark>-2019-37/April 8, 2019/--.

Interview Protocol

Script prior to interview:

I would like to thank you once again for being willing to participate in the interview process of my research. As I have mentioned to you before, my study seeks to understand the perceptions of secondary Spanish literature teachers about mobile learning in their teaching practices. The study also seeks to understand how your beliefs about mobile learning influences your teaching practice and if you support or not these digital practices in their classrooms. The interview today will last approximately one hour.

Are you still ok with me recording (or not) our conversation today? ___Yes ___No

If yes: Thank you! Please let me know if at any point you want me to turn off the recorder or keep something you said off the record.

If no: Thank you for letting me know. I will only take notes of our conversation

Before we begin the interview, do you have any questions? [Discuss questions] If any questions (or other questions) arise at any point in this study, you can feel free to ask them at any time. I would be more than happy to answer your questions. I would like to get a little bit of background information before we start the interview.

Background information

Pseudonym: _____

Teaching experience: _____

Teaching position: _____

Teaching level: _____

Age: _____

370

371

Interview Questions

1. Tell me what you know about mobile learning/or using mobile devices in the classroom
2. Tell me what technological resources, specifically mobile devices you use in your class
3. Tell me how you feel about students bringing mobile devices into the classroom
4. Could you describe how you have used technological or mobile devices in your teaching practice? If you have not used technological use technological devices in your classrooms, how would you like to use that?
5. Tell me how you feel about using mobile learning in your teaching practice
6. To what extent do you think mobile learning should or should not be used in Costa Rican classrooms
7. To what extent is mobile learning supported in your school
   a. What kind of support do you receive from educational stakeholders to incorporate mobile devices or mobile learning in your teaching practice?
8. What is your opinion about the current policy of not removing students' cellphones in the classrooms?
9. Is there anything you think I should know about mobile learning or mobile devices in teaching that you have not told me.

Script at the end of the interview:

Thank you very much for sharing with me. I hope you can help me identified more teachers who can help me understand teachers' perceptions of mobile learning in their teaching practices.

Could you provide me the names of some Spanish literature teachers who have been teaching for 5 or more years and use mobile learning in the classroom?

APPENDIX G
Interview Protocol in Spanish

Protocolo de Entrevista
Guion antes de la entrevista:

Me gustaría agradecerle una vez más por estar dispuesto a participar en el proceso de entrevista de mi investigación. Como les mencioné anteriormente, mi estudio busca comprender las percepciones de los maestros de la asignatura de Español de secundaria sobre el aprendizaje móvil en sus prácticas de enseñanza. El estudio también busca entender cómo sus creencias sobre el uso del aprendizaje móvil influyen en su práctica docente y si usted apoya o no estas prácticas digitales en sus aulas. La entrevista de hoy durará aproximadamente una hora.

¿Todavía estás de acuerdo conmigo en la grabación (o no) de nuestra conversación de hoy?
___Si ____no

Si es así: ¡Gracias!
Por favor, avíseme si en algún momento quiere que apague la grabadora o mantenga algo que dijo fuera del registro.
Si no: Gracias por dejarme saber. Solo tomaré nota de nuestra conversación.

Antes de comenzar la entrevista, ¿tienes alguna pregunta? [Discutir preguntas]
Si surge alguna pregunta (u otra pregunta) en cualquier punto de este estudio, puede preguntar en cualquier momento. Estaría más que feliz de responder a sus preguntas.

Información Personal

Seudónimo: _____

Experiencia enseñando: _____

Materia que enseña: _____

Nivel al que enseña: _____

Edad: _____

Preguntas de Entrevista

1. ¿Me podría hablar acerca de lo que sabe sobre el aprendizaje móvil o el uso de dispositivos móviles en el aula?

2. ¿Me podría hablar acerca de los recursos tecnológicos, específicamente los dispositivos móviles que usa en su clase?

3. ¿Cómo se siente acerca de que los estudiantes lleven dispositivos móviles en los salones de clases?

4. ¿Podría describir cómo ha utilizado dispositivos tecnológicos o móviles en su práctica docente? Si no ha utilizado dispositivos tecnológicos de uso tecnológico en sus aulas ¿Cómo le gustaría usarlos?

5. ¿Me puede decir cómo se siente acerca del uso del aprendizaje móvil en su práctica docente?

6. ¿Hasta qué punto cree que el aprendizaje móvil debería o no debería usarse en las aulas Costarricenses?

7. ¿Hasta qué punto es compatible el aprendizaje móvil en tu escuela?

a. ¿Qué tipo de apoyo recibe de los interesados en la educación para incorporar dispositivos móviles o aprendizaje móvil en su práctica docente?

8. ¿Cuál es su opinión acerca de la política actual de no quitar los teléfonos celulares de los estudiantes en las aulas?

9. ¿Hay algo que usted cree que debería saber sobre aprendizaje móvil o dispositivos móviles relacionados con sus prácticas enseñanza que usted no me ha dicho?

Guion al final de la entrevista:

Muchas gracias por haber compartido su información conmigo. Espero que usted pueda ayudarme a identificar más maestros me ayuden a comprender las percepciones de los profesores de los colegios de secundaria de Costa Rica, acerca del aprendizaje móvil en sus prácticas de enseñanza.

¿Podría darme los nombres de algunos profesores de la asignatura de Español que han estado enseñando durante 5 o más años y usar el aprendizaje móvil en el aula?

APPENDIX H

Teacher's Perceptions of their Experiences Code Book from NVivo12 Software

Table H.1

Teachers' Perceptions of their Experiences Codes from NVivo12 Software

Name	Files	References
And I do not say that it is bad or good I can no longer have an idea. But they are seeing information, they are reading information in the sense that they are capturing everything through their eyes, let's say a video, reading, reading information, etc. Ma	2	2
Because he has friends here, you and is there is a student who tells me I don't have a cell phone, I'm surprised. Because everyone has a cell phone	2	2
Informing students	2	3
Lack of security in classrooms	2	3
Lack of support from stakeholders	7	16
Actually, the MEP says yes, but it doesn't give the tools. Obviously, MEP says that the use of ICTs is important, but the MEP does not invest in them, every teacher must see what to do regarding this, especially because there is already a fairly new generation	1	1
Bothering teachers	2	2
Isolation-frustration	3	3
Lack of communication with principal	3	3
Lack of internet access	10	13
Lack of opportunities for P.D	10	24
Lack of knowledge to use MD's	7	14
, I, as the meme says, what it feels to have a smartphone but you're not so smart to use it.	2	2
Frightened to use it (b)	4	4
I believe that lack of knowledge is what has terrified us	1	1
Lack of knowledge-Afraid to use cellphones	1	1
So it may be very easy to implement, but with only practicing it once we do not learn.	2	2
Struggle (e)	1	1

Name	Files	References
We have lack of information, in our areas, in our subject. Then we struggle.	1	1
What I say is that technological advantages that we can have here are being taken away from us	2	2
Limitation of resources	10	40
Investing in resources (v)	1	1
I would like to have tablets, so that they could read whatever they wanted.	1	1
Resources at school	6	9
"investing is sowing" ,	1	1
Limited use (v)	3	5
Low economic status of students	7	12
Stakeholders policies-use of M.D's	8	20
Suits against teachers	1	1
The MEP attacks educators. Educators are blamed for everything. But at home the parent is doing absolutely nothing	1	1
The Ministry of Education has that goal always. But at the time of reality, it is different.	2	2
Large size class	2	2
Limitation of information	2	3
M.D's harmful and beneficial for teaching	9	15
Altamira I don't like it. They love it	2	2
Teachers concerns about the use of mobile devices in the classrooms	9	25
Actually, the tool is not the telephone, the tool is what it is for; the cellphone is the means that gives me access to a world.	1	1
Behaviors concerns	4	6
Addiction to the use of cellphones	5	5
Because they are lazy and because they are connected on Internet; so they find something that can help them to copy and paste.	1	1
Distraction by the use of cellphones (b)	8	17
According to my perception, it is a 100 percent distraction.	1	1
at least there is one that is paying attention	2	2

Name	Files	References
At least one is paying attention. Others are on the phone, and I say, I do not complicate my life with them.	2	2
Listening to music	3	3
Yes, because it is awful to feel ignored.	2	2
It's a dependency	7	10
Broke interpersonal-physical oral communication	3	4
It's like a dependency [towards the phone] it is not ugly, but it is horrible.	1	1
Let's say it's a professional dependency.	2	2
Sure because it's like a vice. I see it as a vice for the students because they spend the whole day looking at the clock on their phone	2	2
Playing with phones	4	11
Pornography	2	2
Suffering from bullying	2	3
Concerns about students' reading skills (e)	6	10
It is difficult to read using the mobile phone	1	1
The boys now don't like to read	2	2
Importance of reading choice	1	1
Lack of socialization-isolation	4	4
Dehumanized education	2	3
Education has to be humanized, more humanized.	1	1
There's apathy	2	2
Privacy-exposed by memes	6	12
Students' maturity to use MD's (b)	3	6
Frustration (em)	2	2
Importance of M.Ds for teaching practice	5	6
I insist that it is a useful tool but	2	2
Teachers knowledge of M.D's	5	5
For me yes, that's why I say yes. I feel, I declare myself ignorant in many ways, because I don't like it.	2	2
I declare myself ignorant in many aspects.	2	2
I think that is a good tool, if we know how to use it properly.	2	2

Name	Files	References
Teachers implementing the use of mobile phones for their educational purposes in the class	10	31
Accepting using phones in class(v)	8	15
Beneficial for teaching (b)	7	19
Getting Knowledge	7	14
Looking up for concepts	5	6
Now with the excuse that they have the information on the phone, because they put the text of their phone. But they don't, they don't read it.	1	1
Reading with cellphones	5	10
Fantastic experience with technology (v)	1	1
Beautiful (e)	1	1
Cellphones-convenience (b)	4	4
Fantastic tool (v)	1	1
Helpful tool (v)	2	2
I like it. Yes I like it, I feel it facilitates the learning process	3	3
I really love it.	1	1
Students' engagement	7	14
M.D's for entertainment (b)	1	1
Send them a link and they are fascinated.~	1	1
Students' fascination by using cellphones(b)	5	8
Well I consider the phone to be a tool.	2	2
I feel satisfied, because I feel I am making a more creative plan. Much more creative.	3	3
Dynamic process-technology	1	1
Fast communication-apps	2	2
Giving importance to lifelong learning	3	4
Resistance to use technology by teachers (b)	2	2
Technology is important and is good when used correctly.	2	2
The cellphone is handy. The person knows that he can look for the digital book; they can read it in PDF.	2	2
~ I don't use my phone because it is very intelligent and the owner is not ~	2	2

Name	Files	References
M.D's and academic performance	3	4
Teacher's cellphone dependency	3	7
Teachers' meme page	5	5
Misinformation by use of phone (b)	3	5
New Curriculum	6	7
Evaluation differences	4	6
Time constraints	3	5
In these countries, they are so full of extracurricular activities.	1	1
Not pursuing P.D	1	1
Physical limitations	1	1
Reading-book clubs	2	2
So with those who have cell phones and better than mine	2	2
Social constraints	4	4
And if you take the phone away from the student, the parent creates a problem, then you "can't swim against the current." Therefore, the rules is to keep it as they please.	1	1
Parent's responsibilities	3	4
Parents and their children's use of cellphones (b)	5	7
Then there is a gap between homes. As long as the child or the young person has what I did not have, because that is their discourse, that he has what I did not have, in every sense, and the first thing nowadays that the child needs to have is a mobile phone	1	1
Strenuous weather conditions	2	2
Students' Scholarships	7	14
Students' cellphone affordability	9	19
Being a teenager is difficult (v)	1	1
Cellphones limited capacities	2	3
Competing for having newest phones	1	1
Everyone, I already did the survey. All of them! It was the first thing I did at the beginning of the year. Old phones, newer phones, broken phones, not broken, but all of the students have phones.	1	1
Student's access to internet -limited	8	14
Students-digitally skillful (b)	6	13

Name	Files	References
Is that they are mastered by technology quite well. They were already born with that chip. True yes.	2	2
So it seems to me that if they were born with the chip.	2	2
Well almost all students have a cellphone,	2	2
Teachers' empathy towards students	3	3
Teachers' rules in the classroom	10	42
Adapt to new technologies (a)	9	22
"this is part of the progress; we do not live in isolation."	1	1
I also believe that there is not a culture to use the cellphone in the class, maybe a little more Education is needed to use the cellphone.	2	2
Lack of guidelines to use phones	2	4
Older teachers not open to technology	5	7
Teacher's negotiation with the use of phones	6	16
Teachers discontent (b)	1	1
They are given a certain time to use the cellphone, because if it is difficult to control them;	2	2
Teaching constraints	2	2
The fact that he gets to work with his cell phone and that for them is like an extension of his body.	2	2
Why are you going to swim against the current~ Like limiting them using the phone … it cannot be possible, because then there they are going to rebel against you and your subject matter.	2	2

APPENDIX I

Cultural Committee Suggestions and Approval about Costa Rican Cultural Expressions Translated into English

Table I.1

Cultural Committee Suggestions and Approval for Costa Rican Cultural Expressions into English

Expressions in Spanish	Translation into Spanish	1. Manolo Rojas	2.Ana Campos	3.Alfredo Ortega
1. Pero fueron tan bandidos que se les ocurrió grabarse primero	But they were so smart that they recorded themselves first			ok
2. Entonces ellos dijeron que ya eso era trampa	Then they said that I was playing tricks on them	Depending on the context, cheating could be an option.		Context related I agree with Manolo's
3. Que torta verdad!	What a problem, right?			ok
4. Pero son cosas que no sabe si jugarse el chance o que	But they are things that we don't want to risk.		But those are things we don't want to risk	Agree with Ana's
5. Los memes están bajados de tono	The memes are less offensive.			ok
6. Eso yo no lo pongo en la tela de duda	I don't doubt that			ok
7. Ellos se pueden estar agarrando a pescozones limpios	They can be fighting and punching to each other			ok

8. Que todo funcione de las mil maravillas	That everything works wonderfully			ok
9. Uno lo que hace es que los los saca un momentico	What I do is to take them out of the classroom for a little bit			… for a little while
10. Ellos se mueren de risa	They laugh hard			ok
11. Máximo si el meme es grosero	Even more if the meme is offensive or mean			ok
12. No ven que ustedes de una forma son listos	Don't you see that in a way you are smart			ok
13. La profe no nos está tramando	The teacher is not lying to us			ok
14. Bueno, la torta es	Well, the problem is			ok
15. Y lleva rojas	And he has grades lower than 75 %		En la escuela la nota minima es de 65, más bajo que esto es roja.	and he's not doing well in school….
16. Yo no sé cómo será en otras latitudes	I don't know how it is in different places			… in different latitudes
17. Hay poblaciones que ni fu ni fa	There are populations that do not care	They don't really care about it		Agree with Manolo's

18. Ellos se embeben con el uso del cel	They are really engaged when using the cellphone			ok
19. Llave maya	Flash drive			ok
20. Juéguesela usted	Try to know how to (use or do)		Do it as you can	Agree with Ana's
21. Ellos van años luz de uno	They are way more advanced than us		They are light years ahead from us.	Agree with Ana's
22. La tónica es que a ellos siempre	The usual behavior is that they always			ok
23. "Valeverguistas"	Careless			Devil - may- care Irresponsible
24. Así honestamente no me jodería tanto	Honestly, I wouldn't work a lot			ok
25. Un bochito de teléfono	A very old phone			ok
26. Así no se me hace una charanga	In that way I don't have a mess			In this way , I won't make a mess.
27. Ella me siguió la corriente	She followed my ideas			ok
28. Para que se empape de la información	So he really gets to know the information			so that she can be better informed

29. Yo lo apechugo	I embrace it.	I back you up	I accept all responsibility.	Agree with both
30. Porque hay un montón de cochinadas que ven	Because there are many useless things they see			ok
31. Ahora les duele una pestaña y no van a	Now they have the slightly pain and they don't go to		Because they have a minimal pain, they don´t go	Now they don't have the slightest pain and they don't go to
32. NiNi	Neither work nor studies			Neither works nor studies
33. Entonces damos tumbos cuando	So we struggle when			ok
34. La tecnología es una cochinada	Technology is useless			ok
35. Viendo tonteras	Watching fool things			ok
36. Nadar contra la corriente	To swim against the flow			ok
37. El hábito no hace al maestro	Practice makes perfect		The habit do not do the monk.	the habit DOES not make the monk
38. Gajillos de teléfonos	Old and broken phones			ok
39. Ponerse las pilas	To work hard			ok
40. Alcahuete	Pimp			
41. El tiempo apremia	There's limited time			There's not enough time

42. Esto es mi machete, mi materia prima para trabajar	These are the materials I use to work on a daily basis			ok
43. Que chiva!	This is cool!			Cool!
44. Arma de doble filo	Double edged sword			Double-edged sword
45. Compartir saldo	To share data			ok
46. Me hacen un alboroto	They make a mess			ok
47. Dizque para no	Supposedly not to			ok

APPENDIX J

Email Conversation with Dr. Jonathan Smith

Figure J1. This is the screenshot email conversation I had with Jonathan Smith on November 7th, 2019. I asked him the difference between Thematic Analysis and Interpretive Phenomenological Analysis. Dr. Smith expressed that in IPA there is a a lot more interpretative activity involved during the analysis.
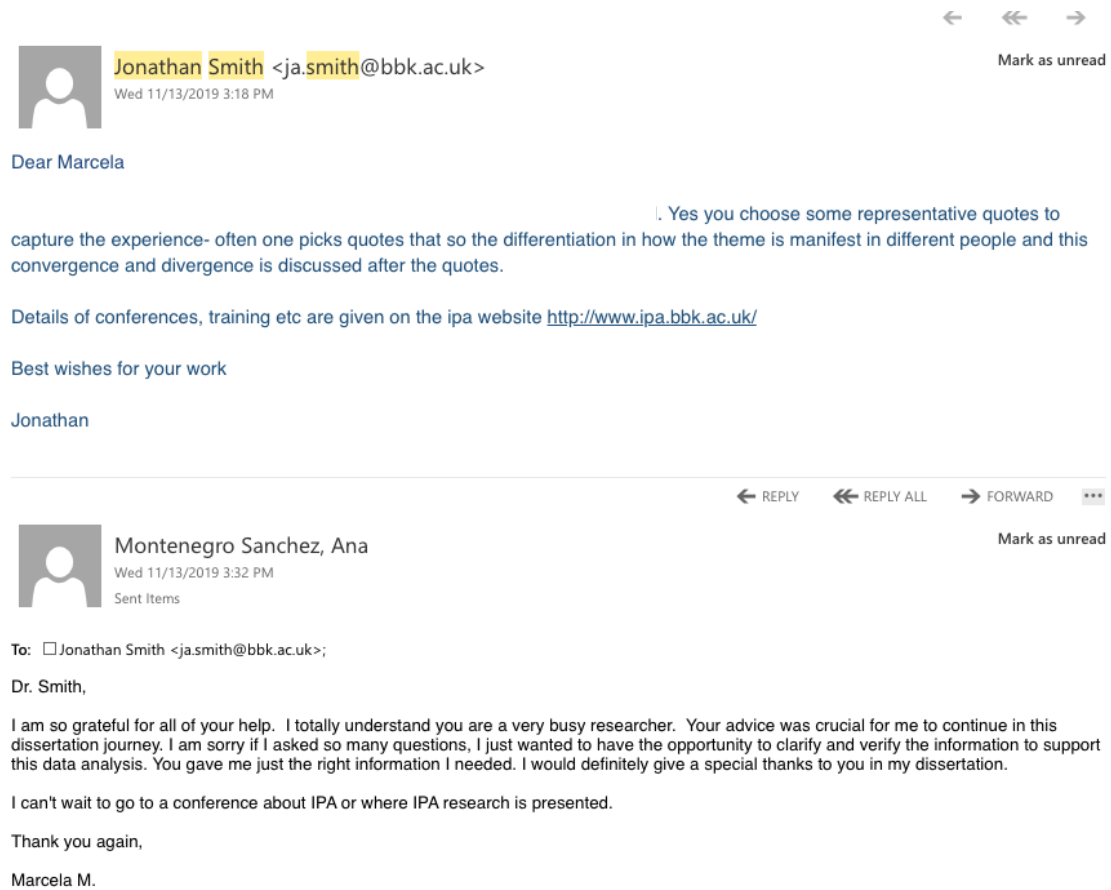
Figure J2. This is a screenshot email conversation with Jonathan Smith on November 13th, 2019. He explained how the quotes in IPA analysis can be chosen when there is a large sample population.

VITA

Ana Marcela Montenegro Sánchez

EDUCATION

2014- present   Ed.D., in Literacy , The School of Teaching and Learning, Sam Houston State University
Dissertation: *Selected Costa Rican Secondary Teachers' Perceptions of their Experiences about Mobile Devices in the Classrooms*
Dissertation Advisor: Hannah R. Gerber, Ph.D.
Expected Graduation: July, 31st

2008   M.Ed., Education, Universidad Nacional
Concentration: Emphasis in Learning English
Publication: *Teachers Educating Women to Eliminate Gender-Based Misconceptions*

2003   B.A. Sciences of Primary Education, Universidad de Costa Rica,
Concentration: Emphasis in English

TEACHING EXPERIENCE

Higher Education Teaching Experience

Spring 2020   The School of Teaching and Learning, Sam Houston State University.
- Instructor of Multiliteracies READ 4415 (1) & (2)

Fall 2019   The School of Teaching and Learning, Sam Houston State University.
- Instructor of Emergent and Beginning Literacy READ3380

Spring 2011   The School of Teaching and Learning, Sam Houston State University.
- Instructor of Language Arts-Assessment READ 3384

Fall 2018   The School of Teaching and Learning, Sam Houston State University.
- Instructor of The Teaching of Language Arts READ 3372

2015-2017	The School of Teaching and Learning, Sam Houston State University

- Instructor of Literacy Assessment and Instruction READ 3371

2008-2014	Universidad de Costa Rica, Guanacaste, Costa Rica

Courses taught:
- Methodologies for the Teaching of English
- Oral Communication in the Second Language I, II, III
- Written Communication in the Second Language I, II, III
- English Grammar I, II, III
- English Rhetoric I, II, III
- Communication and Pronunciation Techniques in English

2004-2005	Universidad Nacional de Costa Rica Guanacaste, Costa Rica

Courses taught:
- Oral Communication in English 1-6
- Written Communication English 1-6
- Laboratories of English Pronunciation
- Second Language Acquisition Theories

K-12 Teaching Experience

2012-2014	Ascensión Esquivel School, Guanacaste, Costa Rica. English foreign language teacher
2003-2013	Guardia Elementary School, Guanacaste, Costa Rica. English foreign language teacher
2005-2006	Instituto Nacional de Aprendizaje. Península de Papagayo, Guanacaste, Costa Rica. English foreign language teacher
2003-2004	Adventista School, Guanacaste, Costa Rica. English foreign language teacher

OTHER TEACHING EXPERIENCE

Summer 2019	STEM Camp Facilitator/Coordinator. Prepared lessons using Computational Thinking Skills and taught to pre-service teachers of Sam Houston State University, at The Woodlands High School 9th Grade Campus

Spring 2019	Professional Development provided to English foreign language teachers of Guanacaste, Costa Rica
Spring 2019	Professional Development provided to English foreign language teachers of Yerevan, Armenia

AWARDS AND NOMINATIONS

2018-2019	Outstanding Teaching Assistant Award. Graduate Studies of Education. Sam Houston State University
2015-2016	Nomination for Outstanding Teaching Assistant Award. Graduate Studies of Education. Sam Houston State University

GRANT WRITING

Spring 2019	Grant writing collaboration of "Project *EXCELLENCIA: A TOT Collaborative Initiative to Support STEAM & Bilingual Education in Costa Rica"* Sam Houston State College of Education (COE) in collaboration with Alliance for Bilingualism (ABi) of the Ministry of Public Education of Costa Rica (MEP). Grant ($25 000). Role: Project co-leader

PUBLICATIONS

Book Chapters

Montenegro, A. M. (2018). Motivando a los lectores renuentes a través de espacios digitales. In R. Arroyo, M. Almenra, C. Holgado-Sáez & T. Lara (Eds.), *Investigación en la escritura: Tecnología, afectividad y competencia académico-cultural*. Octaedro, Madrid, España.

Aboulkacem, S., Foster, C., Gerber, H. R., & Montenegro, A. M. (2018). Ms. Marvel as a new kind of superheroine: Analyzing identity, race, and gender with comics. In S. Eckard (Ed.), *Comic Connections: Reflecting on women in popular culture* (pp.39-54).

Research Articles

Manuscripts in Progress

Braktia, B., Montenegro, A. M., & Haas, L. (2019). *An analysis of information and communication technology adoption and the impact on reading and mathematics assessment scores in 4th and 8th grades: A national study.* Manuscript in preparation.

Braktia, B., Belalia, F., & **Montenegro, A. M.** (2019). *The role of social media in the 2019 Algerian protests.* Manuscript in preparation.

Montenegro, A. M., & Stanford, B. J. (2017). *Guided reading: What it looks like and why we do it.* Manuscript in preparation.

Stanford, B. J., & **Montenegro, A. M.** (2017). *Pre-service teachers' perceptions of blogging as a pedagogical tool to facilitate engagement in online book clubs.* Manuscript in preparation.

Montenegro, A. M., Aboulkacem, S., & Votteler N. (2016). *Readers' voices and free reading: Let's gather and talk.* Manuscript in preparation.

Journal Articles

Montenegro, A. M., Braktia, B., & Koptelov, A. (2020). Modern pedagogical technologies as a way of improving the quality of teaching a foreign language in the context of university students' education. The Pushkin State Russian Language Institute, Moscow, Russia.

Montenegro, A. M. (2016). Fostering diversity in the English classroom. *A Journal of the Texas Council of Teachers of English Language Arts, 46*(1), 55-57.

Montenegro, A. M. (2009). Teachers educating women to eliminate gender-based misconceptions. *Ensayos Pedagógicos: Edición Especial de la Maestría en Educación*. Heredia, Costa Rica: UNA editorial de Educación.

PROFESSIONAL PRESENTATIONS

National/International

Montenegro, A. M., Nasiri, S., & Braktia, B., (2020, February). Teaching ESL/EFL students with a flipped classroom approach. TEXTESOL IV Annual Regional Conference 2020. Teaching in a Culturally Responsive World. Houston, Texas.

Nasiri, S., Montenegro, A. M., & Braktia, B. (2020, February). *Strategies to move toward culturally teaching in ESL classrooms.* TEXTESOL IV Annual Regional Conference 2020. Teaching in a Culturally Responsive World. Houston, Texas.

Braktia, B., O'Donnell, M., & Montenegro, A. M. (2020, February). *Empowering ESL students through project based learning. TEXTESOL IV Annual Regional Conference 2020.* Teaching in a Culturally Responsive World. Houston, Texas.

Martirosyan, N. M., Awuor, D., Braktia, F., & Montenegro, A. M. (2020, February). *The learning experiences of international doctoral students in the United States:*

Opportunities, challenges, and coping strategies. Universality of Global Education Conference: Building CommUNITY through Education and Culturally Responsive Methodologies. Sam Houston State University, Texas.

Braktia, B., Montenegro, A. M., & Haas L. (2020, February). *Establishing reliability and validity of an instrument to measure digital literacy practices and perceptions in higher education*. Southwest Educational Research Association. 43rd Annual Meeting Conference Program. Dallas, Texas.

Nasiri, S., Montenegro, A. M., & Marquez, G. (2019, November). *Culturally responsive teaching.* 2019 TEXTESOL State Conference: The ABC's of TESOL. San Antonio, Texas.

Braktia, B., Montenegro, A. M., & Belalia, F. (2019, October). *The role of social media in the 2019 Algerian protests.* Fulbright Association, 42nd Annual Conference & Advocacy Day "Connecting Minds and Hearts for Global Change." Washington DC.

Sehlaoui, A.S., Koptelov, A., & Montenegro, A. M. (2019, October). *Project EXCELLENCIA: A TOT Collaborative Initiative to Support STEAM & Bilingual Education in Costa Rica.* COE Grace Day: Gran Research Activity & Creativity Exposition. Sam Houston State University, Huntsville, Texas.

Koptelov, A., & Montenegro, A. M. (2019, May). *Developing technology based projects for teaching and learning a foreign language.* 2nd Annual International Educational Symposium "University and City: partnership for success." Moscow, Russia.

Braktia, B., Montenegro A. M., & Pimrawee, R. (2019, February). *Teaching students from culturally diverse backgrounds: Pedagogical implications and strategies.* TEXTESOL VI Regional Conference. Houston, Texas.

Nasiri, S., Montenegro, A. M., & Braktia, F. (2019, February). *Helping language learners to cope with foreign language anxiety.* TEXTESOL VI Regional Conference. Houston, Texas.

Braktia, B., & Montenegro, A. M. (2019, February). *An analysis of information and communication technology adoption and the impact on reading and mathematics assessment scores in 4th and 8th grades: A national study.* Presentation at Southwest Educational Research Association (SERA). 42nd SERA Annual Meeting. San Antonio. Texas.

Braktia, B., & Montenegro, A. M. (2018, November). *Improving women's socio-economic status in Algeria and Costa Rica: Non-formal educational workshops.* Project presentation at Fulbright Association, 41st Annual Conference. Un Mundo Muchas Voces: One World Many Voices. Puebla, México.

Montenegro, A. M. (2018, October). *Bilingual teachers' perceptions regarding the incorporation of mobile technologies in bilingual classrooms*. Virtual presentation at VIII International Scientific Conference: Actual Problem of Romance and Germanic Philology and Methods of teaching Foreign Languages. Francisk Scorina Gomel State University. Belarus, Russia.

Braktia, B., & Montenegro, A. M. (2018, October). *Breaking cultural, geographical and linguistic barriers: Women empowerment projects in Costa Rica.* Presentation at Joan Prouty Conference on Literacy and Community Engagement. Huntsville, Texas.

Nasiri, S., Montenegro, A. M., & Braktia, F. (2018, September). *Foreign language learning anxiety: Strategies for coping with it.* Presentation at 2018 GATESOL Annual Conference Making Relevant Connections: Research, Policy, Practice; Atlanta, Georgia.

Braktia, B., & Montenegro, A. M. (2018, March). *Students' perceptions of social media as a means to improve their language literacy skills*. Presentation at The Tenth International Conference on Mobile Hybrid, and Online-learning. Rome, Italy.

Montenegro, A. M., & Aboulkacem, S. (2018, March). *Readers' voices and free reading: Let's gather and talk*. Presentation at Universality of Global Education Conference. Educational Mosaics: Culture, Community, Collaboration. Sam Houston State University, Huntsville, Texas.

Nasiri, S., & Montenegro, A. M. (2017, November). *Mini lessons: Magic strategies to meet the needs of ELLs.* Presentation at TEXTESOL State Conference 2017, Houston, Texas.

Montenegro, A. M., & Nasiri, S. (2017, November). *Modified guided reading to enhance literacy skills in English language learners.* Presentation at TEXTESOL State Conference 2017, Houston, Texas.

Nasiri, S., & Montenegro, A. M. (2017, November). *Mini-lessons – Making English language learning meaningful.* Presentation at Annual Joan Prouty Conference in Early Literacy. Sam Houston State University, Huntsville, Texas.

Stanford, B., & Montenegro, A. M. (2017, May). *Pre-service teacher's perceptions of blogging as a pedagogical tool to facilitate engagement in online book clubs.* Paper presented at 19th Annual International Conference on Education, Athens, Greece.

Montenegro, A. M. (2017, March). *Engaging reluctant readers through virtual spaces*. Simposio IEE. Universidad de Granada. Granada, Spain.

Nasiri, S., & Montenegro, A. M. (2017, February). *From silence to active participation: Using literature circles to reduce anxiety among refugees and ELL.* Presentation at the National Association for Bilingual Education (NABE). Dallas, Texas, USA.

Nasiri, S., & Montenegro, A. M. (2017, February). *Caring across communities.* Presentation at Texas Association for Literacy Education (TALE). Corpus Christi. Texas, USA.

Votteler, N., & Montenegro, A. M. (2016, November). *The composition process: Developing strategies and skills for the classroom.* Presentation at UNIBE, San José, Costa Rica.

Montenegro, A. M. (2016, August). *Readers' voices: Let's gather and talk.* Poster presentation. Finnish Reading Association. Turku, Finland.

Nasiri, S., & Montenegro, A. M. (2016, February). *Meeting the needs of language learners: The SIOP model.* Poster presentation at Texas Association for Literacy Education. San Antonio, Texas, USA.

Aboulkacem, S., & Montenegro, A. M. (2016, February). *Video games and writing in academia: What students could take from home to class.* Texas Association for Literacy Education. San Antonio, Texas, USA.

Montenegro, A. M. (2015, October). *Teaching sentence combining strategy to improve writing fluency in ESL/EFL learners.* Presentation at TEXTESOL State Conference 2015. San Antonio, Texas, USA.

Montenegro, A. M. (2015, September). *Technologies to improve literacy skills in second/foreign English language learners.* Presentation at International Council for Educational Media (ICEM). Medellin, Colombia.

Montenegro, A. M. (2015, July). *Teaching sentence combining strategy to foreign language students of Costa Rica.* Poster presentation at 19th European Conference on Literacy. Klagenfurt, Austria.

Montenegro, A. M. (2013, August). *Helpful strategies to teach English foreign language learners.* I English Teaching Congress, Northern Zone. San Carlos, Costa Rica.

KEYNOTE SPEAKER

Fall 2019   Keynote Graduate Student speaker at the SHSU
                      International Community Welcome Dinner

PANELS INVITATIONS

Fall 2018	Panel member to discuss dissertation journey at Sam Houston State University. Invited by Hannah R. Gerber Ph.D. Class: Dissertation in Lit Leadership LITC 8030
Spring 2018	Panel member to discuss dissertation journey at Sam Houston State University. Invited by Hannah R. Gerber Ph.D. Class: Dissertation in Lit Leadership LITC 8030
Fall 2016	Panel member during the Week of Modern Languages *"Lecture Language Learning: Globalization and Economic Development"* at Universidad de Costa Rica. Invited by Ronny Ruiz M.B., Guanacaste, Costa Rica

GUEST SPEAKER

Summer 2018	Invited by Julio Medina M.B. as a guest speaker for his class at Sam Houston State University. Course: Elementary Spanish I LAB SPAN 1411
Fall 2015	Invited by Dr. Benita Brooks as a guest speaker for her class at Sam Houston State University. Course: Content Area Reading in Middle Grades READ 3373
Spring 2015	Invited by Dr. Benita Brooks as a guest speaker for her class at Sam Houston State University. Course: Content Area Reading in Middle Grades READ 3373
Fall 2014	Invited by Dr. Mary Petron as a guest speaker for her class at Sam Houston State University. Course: Second Language Acquisition BESL 3301

PROFESSIONAL AFFILIATIONS

2019TESOL International Association

2018-PresentSouthwest Educational Research Association

SERVICE

Leadership and Volunteer Experiences in Non-Profit Organizations

2019   Established collaboration between The Center of
                International Education (CIE) of Sam Houston State
                College of Education and the Ministry of Public Education
                of Costa Rica

2018-present   Algerian-Costa Rican Women's Empowerment Project. Costa Rica's
                Coordinator
                - Provided virtual workshops for women from low socio-
                  economic status of Guanacaste, Costa Rica to make
                  cosmetic products
                - Taught virtual courses through Google Classrooms to
                  prepare beauty products

2018   Diversity Education Institute Non Profit Organization (D.E.I).
                Vice-president

2017   UNESCO. Mobile Learning Week 20017
                - Volunteered at the workshop Creating Mobile Learning
                  Resources for Displaced Populations in Times of
                  Emergency and Crisis.
                - Volunteered with International Council of Educational
                  Media (ICEM) and INEE. Strategy Lab

2015-2016   Member of Graduate Supportive Group.
                International Council of Educational Media (ICEM)

2000-2008   Volunteer/Program Coordinator of Global Learning
                Non-Profit Organization, Guanacaste, Costa Rica;
                Rivas, Nicaragua; San Francisco, California, U.S.A

2004   Volunteer for Habitat for Humanity. Nicoya, Costa Rica

2003   "Adelante, Si Podemos" Girls' Self-defense
                Program Coordinator. Global Learning, Guanacaste, Costa Rica.

PROFESSIONAL DEVELOPMENT

2011   Evaluation of the Learning Process for In-Service
        English Teachers. Ministerio de Educación Pública de
        Costa Rica & Instituto de Desarrollo Profesional Uladislao Gámez
        Solano, Guanacaste, Costa Rica

2011   Curricula Adaptation for In-Service English
        Teachers. Ministerio de Educación Pública de Costa Rica. MEP &
        Instituto de Desarrollo Profesional Uladislao Gámez Solano, Guanacaste,
        Costa Rica

2010   Didactical Materials Development for the Teaching
        of English in I and II Cycles. Ministerio de Educación Pública de Costa
        Rica & Instituto de Desarrollo Professional Uladislao Gámez Solano,
        Guanacaste, Costa Rica

2010   Methods and Techniques for the Teaching of
        English in I and II Cycles. Ministerio de Educación
        Pública de Costa Rica & Instituto de Desarrollo Professional Uladislao
        Gámez Solano, Guanacaste, Costa Rica

2006   Language, Proficiency, Methodology, and Cultural Awareness (In
        Addition to Cultural Activities). University of North Carolina, Greensboro
        Complutense University in Madrid & Alianza Hispánica International,
        Madrid, Spain

2005   Total Physical Response Storytelling. Vision Educativa
        InterHAND. Alajuela, Costa Rica

2005   Ethical-Pedagogical Actualization. Península de Papagayo. Oficina de
        Relaciones Comunitarias Sección Educación. Guanacaste, Costa Rica

2004   The Role of the Image in the Learning Process. Universidad
        Nacional de Costa Rica, Guanacaste, Costa Rica

2003   Teaching with Limited Resources and Motivating the Students to
        Use the Language. Universidad Libre de Costa Rica, Guanacaste, Costa
        Rica

2003   Cooperative Management for Students. Centros de Estudios y
        Capacitación Cooperativa. CENECOOP, R.L. San José, Costa Rica

LINGUAGE SKILLS
English and Spanish (fluent)