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## Challenges Teachers Encounter When Integrating Technology in a Culturally, Linguistically, and Diverse High School

Eliana Rodriguez Molina

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Challenges Teachers Encounter When Integrating Technology in a  
Culturally, Linguistically, and Diverse High School

by  
Eliana Rodríguez Molina

An Applied Dissertation Submitted to the  
Abraham S. Fischler College of Education  
and School of Criminal Justice in Partial  
Fulfillment of the Requirements for the  
Degree of Doctor of Education

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## Approval Page

This applied dissertation was submitted by Eliana Rodríguez Molina under the direction of the persons listed below. It was submitted to the Abraham S. Fischler College of Education and School of Criminal Justice and approved in partial fulfillment of the requirements for the degree of Doctor of Education at Nova Southeastern University.

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## Statement of Original Work

I declare the following:

I have read the Code of Student Conduct and Academic Responsibility as described in the *Student Handbook* of Nova Southeastern University. This applied dissertation represents my original work, except where I have acknowledged the ideas, words, or material of other authors.

Where another author's ideas have been presented in this applied dissertation, I have acknowledged the author's ideas by citing them in the required style.

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Eliana Rodríguez Molina

Name

May 13, 2021

Date

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## Abstract

Challenges Teachers Encounter When Integrating Technology in a Culturally, Linguistically, and Diverse High School. Eliana Rodríguez Molina, 2021: Applied Dissertation, Nova Southeastern University, Abraham S. Fischler College of Education and School of Criminal Justice. Keywords: challenges with integration, culturally and linguistically diverse students, English language learners, technology

Teachers often encounter challenges when integrating technology into a classroom that has a culturally and linguistically diverse (CLD) student population. These challenges have existed as teachers are not adequately trained to integrate technology when working with culturally and linguistically diverse students. Additionally, challenges arise when students do not have technological skills.

This qualitative study examined how high school teachers with a high CLD student population integrated technology into daily instructions and the challenges they encounter when implementing it. Due to the COVID-19 pandemic, the researcher collected data through eight individual teacher interviews via Zoom.

During the data analysis, five general themes emerged: (a) CLD students' lack of adequate technology background, (b) CLD students' lack of technology access results in unequal access to education, (c) inadequate professional development and lack of teacher self-efficacy, (d) extrinsic and intrinsic barriers limit implementation of technology instruction, and (e) technology as a hindrance to CLD students' academic progress. The findings of this study are beneficial in assisting school districts in the United States in identifying the challenges CLD students encounter with technology to make the necessary changes needed for teachers to implement it effectively. An analysis of the data revealed that CLD students' academic achievement was negatively impacted by technology. Additionally, students had better academic success when teachers had hands-on activities.

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## Chapter 1: Introduction

As society transitions from the Industrial Age to the Global and Information Technology Age, technology seems to play a major role in all aspects of life (Marx, 2014). This digital era is requiring schools to integrate Information and Communications Technology (ICT) to provide students with exposure to the 21st-century skills needed to be successful for the jobs of the future in this technology-driven society (Ghavifekr et al., 2016). Furthermore, jobs of the future will require future professionals to be highly trained in technology (Marx, 2014). Therefore, it is crucial for educational organizations to incorporate technology into their curriculums (Ghavifekr et al., 2016; Marx, 2014).

The Common Core State Standards stress the importance of having technology-integrated learning into student's daily instruction (Ehrlich et al., 2013). However, it takes more than just integrating technology into daily instruction so it can provide meaningful and engaging learning activities that promote academic achievement. Teachers first need to trust the technology integration process in the classroom and instill a mindset that technology will facilitate learning for students (Ertmer, 2005). Unfortunately, teachers have difficulty achieving this because they encounter many challenges when integrating technology into daily instruction (Musti-Rao et al., 2014; Pan & Franklin, 2011). This is particularly true in schools with a high culturally and linguistically diverse (CLD) student population (Rao, 2015).

Barriers that keep teachers from implementing technology effectively into the classroom include lack of training and support (Ertmer, 2005; Pan & Franklin, 2011). Furthermore, integrating technology alone will not solve the issues in the classroom or improve daily lesson plans (Ertmer, 2005). Prior research suggests that teachers need to invest their time in learning the pedagogical uses of technology (Ertmer et al., 2016).

Once teachers understand the importance of integrating technology and acquire the knowledge of how to integrate it effectively, then it will facilitate the implementation of technology into their daily lessons. Most importantly, teachers' self-efficacy impacts their ability to effectively integrate technology into daily lessons (Pan & Franklin, 2011). If teachers do not consider themselves efficient in utilizing technology, the implementation will not be effective (Pan & Franklin, 2011).

### **Statement of the Problem**

Despite the attempts of school districts to provide the latest technology, teachers in schools with high CLD student populations have encountered challenges in integrating technology during instruction. Lack of training and self-efficacy are barriers for many teachers when integrating technology (Kuyatt et al., 2015; Pan & Franklin, 2011). Challenges arise when teachers are not adequately trained in effectively integrating technology into daily instruction (Kuyatt et al., 2015; Musti-Rao et al., 2014). Furthermore, there is a significant gap between the self-efficacy of teachers when using technology and the self-efficacy of the students they teach (Pan & Franklin, 2011).

Technology can be a powerful tool for teachers during instruction if used effectively (U.S. Department of Education, 2019); however, teachers are encountering challenges when implementing and using it in daily instruction (Ghavifekr et al., 2016; Hoye, 2017; Khlaif et al., 2019; Vatanartiran & Karadeniz, 2015). Using technology effectively allows teachers to not only meet the needs of all learners, but also assist teachers in making learning meaningful and engaging (Kirschner, 2015; Pan & Franklin, 2011; Reddy et al., 2020).

In addition, researchers indicated that technology has a positive effect in classroom instruction as students are more interested in the content as a result of the

various innovative ways a teacher can present concepts using technology (Murati & Ceka, 2017). School districts across the United States are investing significant amount of money to provide technology. This includes many schools that have provided students with one-on-one devices (Murati & Ceka, 2017). Other schools, especially those that have been recently built, have been designed with the latest technology to enhance learning, including Smartboards, Smart televisions, one-on-one devices, and iPads. Moreover, the lack of training that a teacher receives prior to using new technology produces additional challenges (Ghavifekr et al., 2016). As expected, there are teachers who are knowledgeable of how to effectively utilize technology and those who are unaware of how to use it to their full benefit. However, the greatest challenge is the lack of training that shows teachers how to convey lessons using technology, which results in discouraging teachers in using it all together (Ghavifekr et al., 2016; Saxena, 2017).

Additional common barriers were discussed by Salehi and Salehi (2012), which include ICT insufficient training on how to effectively and efficiently integrate technology in alignment with a lesson, inadequate Internet services, improper training, and inadequate training for students on how to use it, as well as the restrictions on students who use ICT as a noneducational resource. Moreover, technology poses a threat to students by becoming a tool of obsession and interfering with a student's social skills (Marx, 2014).

Teachers' adverse beliefs about technology can hinder its effective implementation, negatively impacting students' academic achievement (Su, 2009). Hsu (2016) concurred by emphasizing that teachers need to make technology an integral part of daily instruction in order to observe its benefits and value in students' academic achievement. Teachers need to increase the use of technology in daily instruction, in

order for students to be exposed and learn how to use it (Blackwell et al., 2013).

### **Phenomenon of Interest**

This study addressed the challenges teachers encountered when integrating technology in a high school with a high CLD student population. The problem was that teachers were encountering difficulties implementing technology into their daily lessons for numerous reasons. First, there were teachers who reported that they had not been adequately trained to utilize new technology, including the Smartboard, which is an interactive device that projects what is displayed on a teacher's monitor (Akçayir, 2011). Smartboards had been installed in every classroom in this school, which, according to Tsayang et al. (2020), were designed to facilitate instruction and strengthen student understanding. However, these interactive boards were not always operable due to many factors, including a lack of upgrades, missing cords compatible with teachers' specific computers, and outdated equipment.

Furthermore, Smartboards did not often operate effectively, as these were older versions passed down from other schools. Moreover, the Wi-Fi did not always function effectively, causing disruption to students' learning because they could not use their school-issued laptops. Most importantly, for the previous 5 years, the Wi-Fi had not been reliable during high-stakes standardized testing. For instance, when trying to log in, students would receive multiple messages that the Wi-Fi was unavailable. Furthermore, students would often be disconnected during the middle of their testing session, causing additional stress and anxiety. Eighty-nine percent of the students in this school were English-language learners, and some were not technology proficient; therefore, they encountered challenges when trying to operate their device. Students also encountered challenges when submitting homework assignments via Canvas as they did not have

Internet service at their home.

Educators have encountered numerous challenges implementing technology as a result of limited administrative, financial, infrastructural, and instructional resources (Ghavifekr et al., 2016; Vatanartiran & Karadeniz, 2015). Similarly, others believe that expectations that teachers have in using technology to enhance teaching and learning in the classroom are not always achieved (Burggraaf, 2020; Schoepp, 2005). For instance, it is common for technological devices to cease working before the beginning of a class or during the middle of a lesson for both a student and teacher due to ineffective Internet connection (Ghavifekr et al., 2016). Most importantly, the integration of technology must be meaningful; however, the lack of teacher training and understanding of technology has hindered this process (Burggraaf, 2020; Connor & Beard, 2015).

Furthermore, teachers constantly experience difficulties overcoming barriers when a school's technical support technician is not available to correct issues in a timely manner (Akçayir, 2011). This type of issue is a deterrent for teachers to continue implementing technology into their daily lesson plans. Administrator support remains a continued lacking problem that teachers encounter when learning or trying to implement technology into their classrooms (Ertmer et al., 2012; Kay, 2006; Khlaif et al., 2019; Schoepp, 2005). Teachers need training that is not only influenced but rather supported by school administrators when expected to use technology successfully in the classroom (Akyol, 2016).

### ***Background and Justification***

Teachers face challenges in the classroom when integrating technology (Hsu, 2016). Most of the barriers that teachers encounter derived from their lack of knowledge of how to effectively implement technology into instruction (Alenezi, 2017; Mueller et al.

2008; Su, 2009). On the contrary, other researchers have indicated that there are teachers who believe to have technology knowledge; however, it does not necessarily mean that they can effectively implement it during instruction (Blackwell et al., 2013).

Additionally, teachers who have mixed opinions about technology are hesitant to utilize it during classroom instruction (Blackwell et al., 2013). The obstacles in integrating technology will increase as technology continues to become an integral part of learning, hindering its value as a learning tool. Another factor that affects teachers' ability to effectively integrate technology is the lack of support from educational leaders and the technological department (Hsu, 2016).

Technology is not only a necessity in a student's life, but also the new normal in many school settings (Uluyol & Sahin, 2016). For many teachers, teaching net-generation students is not always easy when net-immigrant teachers or net-native teachers are not effective in engaging their students (Uluyol & Sahin, 2016). Regardless, new and veteran teachers continue to take on the challenge of teaching with technology only to find later that the personal technology skills they foster are not enough to use ICT in their teaching or learning (Fluck & Dowden, 2011). Therefore, teachers' attitudes should be more flexible toward the expectations of using technology in the classroom and the new generation that cannot live without the use of technology (Fluck & Dowden, 2011). In education, technology continues to dominate and evolve constantly in an ever-changing culture (Brown, 2013).

Technology has the ability to bridge both students and teachers in the learning process (Akyol, 2016). The focal point of the Educational Technology Plan for Virginia: 2010-2015 was assuring that ICT, which is one of the 21st-century skills, was incorporated in schools (Board of Education Commonwealth of Virginia, 2020). The

Computer Technology Standards of Learning outline the necessary skills students need to be creative and successful in a group or non-group setting (Board of Education Commonwealth of Virginia, 2020). Through technology, both students and teachers need to know how to interpret and use information (Board of Education Commonwealth of Virginia, 2020). These skills need to be introduced starting in kindergarten and continue through the end of Grade 12 in every subject (Board of Education Commonwealth of Virginia, 2020). Technology standards allow teachers to prepare their lesson plans to align them with technology-based activities (Board of Education Commonwealth of Virginia, 2020).

### ***Deficiencies in the Evidence***

Teachers continue to confront pedagogical uncertainties that make them question their own knowledge and proficiency with technology integration (Hoye, 2017). However, teachers' confidence in integrating technology stems from the fear of the continuous changes in technology (Lopez-Estrada et al., 2019). Consequently, there is a lack of investigation on how teachers are successfully integrating new technology in the classroom (Lopez-Estrada et al., 2019). In addition, there is lack of research on how teachers in schools with a high CLD student population are integrating technology into their daily instruction (Bobo, 2016).

### ***Audience***

Individuals in the educational field will benefit from examining the challenges encountered by teachers who work in a CLD high school when integrating technology. The audience includes school board members, administrators, school leaders, and teachers. This study could help school administrators in identifying the gaps that exist in the process of integrating technology into the classrooms so they can design professional

development on how to effectively implement technology in the classroom. Improving the implementation of technology in the classroom will maximize student achievement and ultimately close the achievement gap.

### **Definition of Terms**

For the purpose of this applied dissertation, the following terms are defined.

#### ***Course Management System***

This term refers to a software apparatus that provides a structured space for teachers to offer an environment of learning (Unal & Unal, 2011).

#### ***Culturally and Linguistically Diverse (CLD)***

This term refers to students who speak a language other than English or in addition to English at home; however, not all CLD students are English-language learners (Bardack, 2010; Lai, 2006).

#### ***Culturally Responsive Classrooms***

This term refers to a means for teachers to put value into students' cultures and to incorporate students' cultures into daily instruction through a presentation of familiar information (Predmore et al., 2017).

#### ***Information and Communications Technology (ICT)***

This term is utilized to refer to all types of technology, including laptops, iPads, and Smartboards, as well as computers, e-mails, and digital materials, that are utilized to enhance teaching and learning (Abadiano & Turner, 2007; Abdoulai Haji et al., 2017; Adedodkun-Shittu & Shittu, 2014; Blundell et al., 2020; Bobo, 2016; Calabrese, 2015; Calabrese & Miller, 2013; Chandra & Leong, 2016; Delgado et al., 2015; Haddad, 2003; Hicham, 2016; Nath et al., 2015; Phillips, 2015).

#### ***Instructional Technology Coordinator***

This term refers to a professional who works closely with teachers and others in the educational field on utilizing technology during instruction. This includes training on how to effectively integrate technology into the classroom (Almeroth & Zhang, 2013; Davidson et al., 2014; Haji et al., 2017; Lightfoot, 2005; Machado-Casas et al., 2017; Richardson & Sterrett, 2018; Ruggiero & Mong, 2015; Sadick, 2008; Wong, 2013; Wood et al., 2012; Zhong & Wang, 2019).

### ***Learning Management System***

This term refers to a software bundle that provides a place for administrators, teachers, and assistants to upload a wealth of information pertaining to specific content instruction, assignments, resources, and more (Jensen, 2010). Blackboard and Canvas are popular applications that enable institutions to use them as a tool for teaching and student learning, which many school districts use to facilitate learning (Clossen, 2018). The system is accessible through Smartphones, computers, and tablets (Al-Kindi & Al-Suqri, 2017). Through this system, administrators, teachers, students, and parents have access to grades and other essential course information students are enrolled in.

### ***Sheltered Instruction***

This term refers to a teaching practice in which English-language learners are receiving high-quality education as they access content through the best methodology for English speakers of other languages (ESOL), including making content comprehensible (Gonzalez, 2016).

### ***Students With Limited or Interrupted Formal Education (SLIFE)***

This term refers to English learners who arrive to schools with no formal education or had limited/interrupted formal education (World-Class Instructional Design and Assessment Consortium, 2015)

## **Purpose of the Study**

The purpose of this generic qualitative study was to explore how teachers in a CLD high school described the challenges when integrating technology (Lopez-Estrada et al., 2019). Further, this study also examined what supports were in place in a CLD school to enhance teachers' efficacy when integrating technology into their daily instruction (Dussault et al., 2004; Efe et al., 2016; Park et al., 2016). Moreover, the disadvantages with which CLD students continue to be impacted involve the continuous lack of technology services that include a lack of supplies and support due to complex policies (Brown, 2013). In addition, teacher self-efficacy is challenged as their attitudes are conflicted with integrating technology because of the lack of training received and the lack of skills pertaining to technology (Brown, 2013; Saxena, 2017). Students have continued to cope while learning how to adjust and use the online technology platform before and during the recent coronavirus pandemic (Sayer & Braun, 2020). In the United States, urban school districts are more inclined to fund a school that is predominantly White than a school that has a principally CLD student population (Bellan, 2019; Sayer & Braun, 2020).

It was fundamental to conduct this study as the use of technology has become imperative, and, according to the U.S. Department of Education (2019), it is crucial for school districts to implement the use of technology into instruction to not only meet the needs of all students and make learning meaningful to students, but also to prepare them for the jobs of the future. Most importantly, CLD students have been identified as the population with the greatest risk in encountering academic challenges (Musti-Rao et al., 2014; U.S. Department of Education, 2017, 2019).

This study will hopefully assist school districts and educators in identifying useful

strategies for effectively integrating technology. School leaders will also benefit from this research to improve any existing gaps in the implementation process for a successful outcome in the use of technology in the classroom. Furthermore, the study aimed to identify the challenges teachers are encountering when integrating technology, in order for school districts to address them. Once the impediments are identified, administrators in the target school district will have the necessary data to implement procedures for all staff at every school to be trained to use technology in an effective way for the teachers to be successful in instructing and the students to be successful in learning.

## **Chapter 2: Literature Review**

### **Introduction**

In this chapter, the researcher presents a review of current literature related to teachers and the implementation of technology into daily instruction. However, the researcher first discusses in depth the theoretical framework that guided the study. Furthermore, the researcher examines the implementation of technology into daily instruction, technology and teacher efficacy, CLD students, and limitations of the literature. Last, the researcher provides the research questions.

### **Theoretical Framework**

The problem related to challenges encountered by high school teachers when integrating technology into their daily instruction in a school with a high CLD student population is grounded in the self-efficacy theory. The self-efficacy theory indicates that, if individuals have the knowledge and skills, it will positively impact their ability to cope and make sound decisions during challenging situations (Bandura, 1997). How individuals perceive self-efficacy is related to their decisions regarding tasks, conduct, and how much they are willing to confront a challenge they loath (Bandura & Adams, 1977). In other words, self-efficacy is about how individuals think about themselves and their capability to organize a way to overcome fears to achieve a particular ending (Bandura, 2001; Kurbanolu, 2004; Yilmaz, 2009). Individuals must be willing to risk threatening experiences that will allow them to achieve resiliency and self-efficacy (Bandura & Adams, 1977).

In addition, four sources of self-efficacy have been recognized: enactive self-mastery, role modeling, verbal-social persuasion, and physiological signals (Bandura, 1997; Bandura & Adams, 1977). It is essential for an individual to create a solid sense of

efficacy because, in this way, the individual can obtain a strong perception of personal efficacy (Bandura, 1997). What individuals allow to affect them when faced with emotional challenges can place them on a path to be unsuccessful (Maddux, 2016). Consequently, if an individual fails before feeling efficient, then the sense of efficacy will be challenging to obtain (Bandura, 1997).

The first source identified is having enactive self-mastery (Bandura & Adams, 1977). To attain this, individuals must perform tasks that are challenging and will often create a negative impact when the individuals are focused on what they lack as a person and not on how successful they can be (Akyol, 2016; Pajares & Schunk, 2001). It slows the individuals from succeeding and instead places them out of reach of success and why it is important to attempt tasks to gain mastery in personal efficacy (Bandura, 1997; Bandura & Adams, 1977). If individuals encounter success with no challenges, they will expect every task to be easy, and, when they fail, they will easily be disappointed (Bandura, 1997). It is important for individuals to encounter challenges to remind them that, in order to be successful, one must put effort into it (Bandura, 1997; Shipherd, 2019). Once individuals succeed at understanding what it means to achieve success, they will not be disappointed when they encounter challenges because they will thrive until the objective is achieved (Bandura, 1997; Kim et al., 2019).

Role modeling is the second source identified by Bandura (1997). According to research, as individuals see other individuals succeed at threatening tasks, they too can cope and be successful (Bandura & Adams, 1977). Similarly, if they observe others fail, they will question their efficacy (Bandura, 1997). The importance of cognitive modeling stems from numerous modeled performances (Bandura et al., 1980). Moreover, when individuals see others perform a task successfully, they tend to overcome those

challenges and learn techniques on how to overcome them (Anstiss et al., 2018; Bandura & Adams, 1977). Individuals also tend to search for qualities in others to emulate by observing those they admire and want to aspire to be like (Bandura, 1997; Shipherd, 2019). As a result, individuals who are open to improving skills will be more receptive to learning new skills and accomplishing them effectively (Bandura, 1997).

The third self-efficacy source is social persuasion, which lets individuals know that they have the necessary confidence to continue (Bandura, 1997). However, individuals often will not have sufficient self-assurance until someone else empowers them vocally (Shipherd, 2019). By doing this, those convinced by encouragement are inclined to succeed even when experiencing uncertainty (Bandura, 1997; Feltz et al., 2008). Therefore, self-advocacy efficacy is obtained when coaxing is exhibited toward other individuals and encourages them to keep trying (Bandura, 1997).

On the contrary, personal efficacy is diminished when there is negative social persuasion toward someone's personal talents (Watson & Marschall, 2019). Hence, individuals will question their ability to take on difficult projects as negative comments toward their self-efficacy will limit their desire to face them (Bandura, 1997). Consequently, it is important for individuals to be truthful about their own personal efficacy when facing a challenge to avoid being defeated by their own attitude (Bandura, 1997).

The fourth source of self-efficacy involves physiological cues recognized by Bandura (1997). It is essential for individuals to determine how to adjust their self-beliefs of efficacy to dominate how they respond to stress and not be prone to succumb to their own weaknesses (Bandura, 1997). When individuals question their strengths and weaknesses, their somatic symptoms automatically communicate to them that something

is defective (Pfitzner-Eden, 2016). Therefore, it is critical to understand how individuals react to their emotions and their abilities and not to how their emotions are seen (Bandura, 1997). In education, teacher self-efficacy beliefs are influenced by demanding and burdensome circumstances (Pfitzner-Eden, 2016). If teachers encounter a challenge, it could potentially have a negative impact and influence their teacher self-efficacy growth (Pfitzner-Eden, 2016).

For those individuals who find success with self-efficacy, it may be the result of the influence of other individuals who have self-efficacy as they place the individuals on a path to success rather than on a path of failure (Bandura, 1997; Wang et al., 2018). As a result, individuals who find success in self-efficacy assess how they have improved by what they are capable of doing and not by how they are better than others (Bandura, 1997). Moreover, it is important for an individual to be positive because it has a positive impact when performing a task (Bandura, 1997; Niemiec & Lachowicz-Tabaczek, 2015). On the contrary, if individuals are negative, then it will negatively impact on their ability to accomplish tasks (Bandura, 1997).

Research shows that four psychological processes explain how an individual's efficacy is affected: cognitive, motivational, affective, and selection processes (Bandura, 1997). The first type of psychological process involves cognitive processes, which are the result of self-efficacy to accomplish a goal (Bandura, 1997; Pfitzner-Eden, 2016; Yilmaz, 2009). Self-efficacy first starts with thinking (Bandura, 1997). For example, if what is on their mind is true or attainable, then individuals will set high standards and be committed toward achieving them (Bandura, 1997; Woolfolk, 1990; Yilmaz, 2009). The individuals decide how an obstacle is confronted, how they manipulate time to accomplish a goal, and how they will embrace failure when a goal is not reached (Bandura, 1997). Often, it

is not always important to attain a goal, but rather address the challenges that were endured to self-motivate to accomplish the goal and what the individuals did to reach it even when failing several times (Bledow, 2013). Therefore, self-efficacy serves as a buffer for those individuals who present themselves with an inclination to be motivated without giving up and reaching the end goal (Bandura, 1997).

The second psychological process involves motivational processes, which are a culmination of effects that impact an individual's decision, determination, success, and surroundings (Schunk & DiBenedetto, 2020). In addition, motivational processes include individuals' personal assessment on their advances due to varying personal and environmental influences (Schunk & DiBenedetto, 2020). In the motivational process, how highly individuals think of themselves is what will drive them to be motivated (Bandura, 1997). It is important to note that Bandura's (1986) theory is centralized in individuals having a sense of power to make changes during significant events (Schunk & DiBenedetto, 2020). Individuals' motivation is empowered by what they think of a particular activity (Bandura, 1997; Wood & Bandura, 1989). This enables individuals to have an action plan to achieve such an activity. They use their sense of power to set and reach goals, while making modifications throughout the events to make sure the goal is established (Schunk & DiBenedetto, 2020). Leithwood (1994), Leithwood et al. (1999), and Liu (2016) expressed the importance of teachers' ability to adapt and undergo change due to their commitment to make adjustments and commitment in seeing their students excel.

The third psychological process involves affective processes, which can be attributed to individuals' self-efficacy and their competency (Bandura, 1997). If individuals do not think they possess certain attributes related to self-efficacy, they will

likely become depressed or stressed (Bandura & Adams, 1977). In contrast, those whose self-efficacy is positive will most likely not become depressed (Bandura, 1997).

Moreover, there are those who feel threatened by other individuals because they believe certain scenarios will occur that can limit their opportunity to succeed (Bandura, 1997).

The last psychological process involves selection processes that allow individuals the ability to be competent in their career and to advance in their career choice (Bandura, 1997). This is achieved by individuals' aptitude in attaining confidence through self-efficacy, which enables them to have access to a wider selection of career choices (Bandura, 1997). In other words, if individuals believe they have what it takes to complete a task and fulfill an objective, they are more inclined to continue the process despite challenges that may arise and are less inclined to surrender (Bandura, 1997). Bandura's theory suggests that it is about how individuals distinguish what they believe they are able to accomplish and not what they actually are able to accomplish (Bandura, 1997). According to Bandura (1997), being able to identify the differences between what one knows and how to use that knowledge to solve a task, make adjustments, and continue to make adjustments is what is essential to this theory.

In addition, within this process, there are three different types of cognitive motivators: causal attributions, outcome expectancies, and cognitive goals (Bandura, 1997). These three representations of self-efficacy involve behaviors and understanding of how and why individuals conduct themselves a certain way when judging what they will do when faced with a challenge (Maddux, 2016). How individuals believe in their self-efficacy is what drives their trait designations (Bandura, 1997). On the contrary, causal attribution is what causes people's behavior to have a negative impact on their ability to learn because of how they view their own self-efficacy (Wang et al., 2018). In

outcome expectancies, individuals are aware that how they behave will have either a positive or negative impact on their efficacy and their ability to function in a way to achieve something (Bandura, 1997; Bledow, 2013). The possibilities can be endless for the individuals, but the outcome expectancy is controlled by how they view themselves (Bandura 1997).

Social-cognitive theory is recommended for individuals to practice success, which will contribute to the ability to alter their personality (Bandura, 1997). This means that individuals' personalities can be altered by how the individuals themselves decode their abilities and past successes (Bandura, 1986, 1997; Joët et al., 2011). The different types of practices that individuals are exposed to will cognitively help them believe that they can succeed when threats of self-doubt or phobias overcome them (Bandura, 1997). In addition, different tasks are given to individuals to expose them to their phobia. Assistance from a professional is needed to guide individuals through the task that enables their coping efficacy to perform the task that was previously avoided. Therefore, working with a therapist is highly recommended to overcome a phobia than trying to overcome it by oneself (Bandura, 1997).

Once individuals have faced their phobia with assistance, the individuals will self-direct themselves without regression (Bandura, 1997). Most importantly, when individuals have the help of a professional therapist, the individuals tend to overcome the phobia in a shorter time than if they were to try to overcome the task by themselves. If the therapy has been successful, the individuals will have strong coping efficacy to guide themselves in order for their stress to not increase (Bandura, 1997). If individuals do not have a strong sense of self-efficacy, they are more likely to fall into depression (Bandura, 1997). It is known for individuals to fall into a weak state of mind based on how they

perceive themselves (Nordlöf et al., 2019). However, most individuals lean on relationships for support and to build confidence because those without personal relationship support will find themselves alone.

There has been a connection with stress and how it negatively harbors the physical function of a person (Bandura, 1997). Stress is the contributing factor when it comes to managing self-efficacy (Eddy et al., 2019). Consequently, it is fundamental for individuals to recognize when they are becoming stressed to regress and be able to control their fear (Bandura, 1997). To the individuals' disadvantage, if they cannot control certain stressors, they are at jeopardy in compromising their immunity and can become ill to the point of not being able to begin or complete a task (Bandura, 1997). Bandura (1997) indicated that those who can control their self-efficacy are more likely to succeed.

Efficacy activated is Bandura's last selection process. Bandura (1997) indicated that the environment and surroundings have an influence on individuals and their formation. Consequently, those who are believed to have self-efficacy are more likely to select an environment in which they will be able to succeed (Bandura, 1997). The path or environment the individuals choose will impact their lives as this leads them in creating certain interests, along with certain curiosities, and people they will meet (Bandura, 1997). Bandura also indicated that, when individuals are persuaded, it will influence their behavior, also impacting their personal development. In all, self-efficacy theories are established by the selections created along the processes. If individuals' self-efficacy views are believable, then the individuals will take the leap in discovering career fields that not only spark interest, but also guide them on a path to success (Stipanovic et al., 2017). The self-efficacy theory has been utilized in studies as an effective tool to predict

whether technology is being successfully implemented in education.

### **Use of Technology in Education**

The use of technology in education has evolved throughout the years (Ahmed-Alismail, 2015). As technology advances and emerges, it continues to be a basic essential that influences and invigorates schools and colleges (Crawford, 2014; Hallström & Gyberg, 2011; Marx, 2014). Technology enables students to learn in different ways, to think critically, and to complete tasks in an efficient way (Marx, 2014). For teachers, technology has created an avenue to receive professional development and to facilitate instruction in a classroom (Marx, 2014). People are no longer looking at how technology can be an advantage in schools, but rather shifting their mindset to seeing how to fully reap the benefits of its significant capabilities (Crawford, 2014). Others argue that schools should focus on teaching the history of technology, as it will enable students and teachers to value technology to ultimately utilize it effectively (Hallström & Gyberg, 2011).

The benefits of technology in education seem productive. However, the right tools are needed for its implementation to be productive (Hallström & Gyberg, 2011). According to Balachandran (as cited in Marx, 2014), a participant of Futures Council 21 from India stressed the importance of knowing how “to integrate technology with teachers as facilitators” (p. 112) and stated how a student who receives instruction will continue to become more personalized (Marx, 2014). If teachers become the facilitator of technology, students will rely less on teachers and rely more on the use of technology to learn and complete their work (Marx, 2014). Hence, it is important for schools to know how to integrate technology into the classrooms (Marx, 2014). On the other hand, technology can create obstacles for both the student and the teacher, where the teacher is

needed less and the student can work asynchronously (Marx, 2014). Additionally, teachers are not accustomed to technology being the driving force of their lessons, as some were trained to be hands-on in their teaching profession (Flowers & Hunt, 2012).

Data indicate an increase of technology systems to support individuals with disabilities (Brown, 2013). In addition, legal evidence acknowledges guides that protect assistive technology and educational-instructional technology pertaining to a student's individualized education program (Brown, 2013). Moreover, Congress passed a law for individuals needing assistance with technology called the Technology-Related Assistance for Individuals With Disabilities Act, which put in place standards and the importance of utilizing technology to educate students with disabilities (Brown, 2013).

Regardless of the legal standards in place that protect students with an individualized education program, and the addition of a variety of software programs being accessible to educators, some students who are CLD are not receiving services or accessing technology despite being on an individualized education program in urban schools (Brown, 2013). This happens whether teachers are new or have years of experience in urban school settings because they are not trained to effectively choose adequate educational-instructional technology software or hardware for a CLD student with disabilities (Brown, 2013).

## **Implementation of Technology Into Daily Instruction**

### ***Background***

The use of technology has made its way into most schools, where teachers are eager to implement technology to transform classrooms (Korucu-Kis & Ozmen, 2019). Agencies such as the National Council for Accreditation of Teacher Education and the International Society for Technology Standards support integrating technology into daily

instruction (Wright & Wilson, 2005). Despite the valuable educational support, research shows that integrating technology into the classrooms is not effectively occurring in classrooms (Korucu-Kis & Ozmen, 2019; Tondeur et al., 2008, 2016). In general, technology is seen as a way to facilitate daily tasks; however, in order for technology to be integrated effectively, educators and school administrators need to collaborate to effectively use technology (Korucu-Kis & Ozmen, 2019; Mumtaz, 2000). Research also shows that many new teachers, along with veteran teachers, do not feel adequately prepared to integrate technology into daily instruction (Kay, 2006; Korucu-Kis & Ozmen, 2019; Sang et al., 2010; Tondeur et al., 2016).

Teachers' lack of self-efficacy toward technology weighs heavily on their decision to comfortably integrate technology into the classrooms (Korucu-Kis & Ozmen, 2019; Wang et al., 2018). Teachers believe that technology will allow them to change how they deliver instruction (Hew & Brush, 2007; Korucu-Kis & Ozmen, 2019). Research shows that it is recommended for teachers to take an all-inclusive approach when integrating technology into the classroom (Korucu-Kis & Ozmen, 2019; Sang et al., 2010). In addition, various researchers agree that integrating technology enhances teachers' ability to teach and students' ability to learn (Ertmer et al., 2012, 2016; Korucu-Kis & Ozmen, 2019). Moreover, teachers of classes for English speakers of other languages stated that technology is a beneficial tool when it comes to teaching language because of the authentic experiences it delivers to students (Korucu-Kis & Ozmen, 2019). Furthermore, educational lawmakers at the national and international levels continue to try to persuade schools of the benefits of implementing technology as it will enhance student language skills and how teachers deliver instruction (Korucu-Kis & Ozmen, 2019).

Because classrooms are becoming more diverse, it is essential for teachers to implement technology into daily instruction to provide this population of students, the tools needed for when they enter professional fields (Leithner, 2009; Plough, 2017; Tarbutton, 2018). Educators need to embrace the reality that classrooms are becoming more diverse and note that technology will remain part of society (Tarbutton, 2018). Therefore, by utilizing technology, teachers can connect students with valuable resources that allow them to access and see cultural diversity without leaving the classroom (Tarbutton, 2018; Wade et al., 2013). Currently, technology continues to be a trendy tool for millennials, a generation with access to all types of information at the touch of a screen or button (Tarbutton, 2018). By integrating technology into the classrooms, teachers will not only engage students through pedagogical approaches, but also enable them to be active learners and prepare them to be citizens of the world (Gonzales & Belleau, 2017; Tarbutton, 2018). Therefore, it is vital for teachers to have access to technology, so they can provide students with inclusive education (Masih & Vidyapati, 2018; Tarbutton, 2018).

### ***Challenges Integrating Technology***

Integrating technology into daily instruction is posing challenges to teachers in many school districts (Inan & Lowther, 2010; Islam & Sevim-Cirak, 2017; Javeri & Chen, 2006; Johnson et al., 2016). Despite teachers acknowledging the benefits that technology integration contributes to the classroom, many teachers frequently encounter challenges with the integration process (Johnson et al., 2016). Most importantly, when used appropriately, technology can enhance learning to increase student academic achievement (Ghavifekr et al., 2016). However, it is imperative to identify the challenges encountered to improve the implementation of technology (Ghavifekr et al., 2016).

Teachers encounter numerous challenges when integrating technology, and these are categorized by researchers into two categories: extrinsic and intrinsic barriers (Ghavifekr et al., 2016; Vatanartiran & Karadeniz, 2015).

**Extrinsic Barriers.** Extrinsic barriers are those that are formed by the lack of infrastructure (Vatanartiran & Karadeniz, 2015). These are the challenges encountered by teachers that are out of their control. For instance, many buildings do not have the ability to support the Wi-Fi connection needed for the devices being used in the building (Ghavifekr et al., 2016; Lopez-Estrada et al., 2019; Vatanartiran & Karadeniz, 2015). In addition to this, many schools have limited ICT facilities, impacting the teachers' ability to integrate technology (Ghavifekr et al., 2016). This includes lack of technology in the classroom, delayed repairing of devices, and the need to update technology in a timely manner (Vatanartiran & Karadeniz, 2015).

A study conducted by Grundmeyer (2013) found that teachers and students experience feelings of frustration as devices often needed service. Another significant finding in this study was that the Internet connection was either constantly interrupted, not working, or too slow to utilize, negatively impacting the teacher's ability to effectively implement technology (Grundmeyer, 2013). Lack of effective teacher training on how to integrate technology is also considered an extrinsic barrier (Ghavifekr et al., 2016). Another extrinsic barrier is the lack of preparation that would come from professional development and teacher training courses (Ertmer et al., 2012; Johnson et al., 2016).

Last, implementing technology into lessons continues to be the center of attention for many teachers, while school districts are paying more attention to the benefits and success of technical knowledge (Alvarado et al., 2020; Paraskeva et al., 2008). However,

implementing technology into the classroom and into daily instruction is more than the effectiveness of technology. The priority should be the teachers' beliefs and attitudes, as well as how prepared and confident they are (Alvarado et al., 2020; Fernández-Cruz & Fernández-Díaz, 2016; González-Sanmamed et al., 2017; Tondeur et al., 2016).

In addition, teachers' beliefs and attitudes are defined by the constant requests for them to adapt to changes that come with implementing technology (Alvarado et al., 2020; Ertmer et al., 2012; Kotrlik & Redmann, 2005; Yu et al., 2017). These requests require teachers to work outside of their professional hours, which result in teachers having conflict with their schedule, becoming overwhelmed, and resulting in resisting against technological changes and interruptions (Alvarado et al., 2020; Ertmer et al., 2012; Kotrlik & Redmann, 2005; Yu et al., 2017). As the interruptions escalate, teachers experience disruptions in their classroom routines, their production, and the ability to make effective instructional decisions (Alvarado et al., 2020). As technology continues to change, teachers need to be updated with adequate training in technology usage (Johnson et al., 2016). In addition, the National Education Association emphasized the need for teachers to learn and be trained on new technology skills to sustain with the demand of it always changing (Johnson et al., 2016).

**Intrinsic Barriers.** Intrinsic barriers are those human centered, which include incorporating technology into their daily instruction (Lopez-Estrada et al., 2019). Teachers' attitudes have a significant impact in their ability to implement technology (Ghavifekr et al., 2016). As schools implement new technology, expectations rise for teachers to implement it into their classrooms for instruction and learning purposes (Uluyol & Sahin, 2016). Moreover, teachers hold the key to dominating how technology is integrated in schools as they control all aspects of how technology will be implemented

in classrooms and can determine if students will benefit from the perks that technology provides (Conway & Zhao, 2003; Uluyol & Sahin, 2016).

In addition, teachers who are driven to implement technology have a tendency to be motivated to use it in the classroom because they exhibit skills of innovation, confidence, flexibility, positive attitude, and openness to constructive criticism (Karsenti et al., 2006; Reyneke, 2020; Uluyol & Sahin, 2016). The concept of motivation is defined as reasons a person's behavior is preserved or altered and influenced to continue the acquired task (Uluyol & Sahin, 2016). Therefore, motivated teachers are less likely to object going forward with implementing technology, regardless of any previous failed attempts (Reyneke, 2020).

### **Technology and Teacher Efficacy**

Technology has impacted teacher efficacy (Dunn & Rakes, 2010; Tschannen-Moran & Hoy, 2001). Teachers are known to have the pedagogical training that contributes to students' learning and the final effect it has on them regardless of who they are or where they come from (Dunn & Rakes, 2010; Pajares, 1996; Tschannen-Moran & Hoy, 2001). However, teachers' attitudes and beliefs toward technology have the ability to influence how they will approach learning about technology and integrating it into the classroom (Dunn & Rakes, 2010; Ertmer et al., 2016). According to Bandura (1986), efficacy is the main factor of initiation.

Therefore, teachers need to be prepared to use technology, as their efficacy weighs heavily on the choices they make when integrating technology when teaching this student population (Ashton & Webb, 1986; Cousins & Walker, 2000; Dunn & Rakes, 2010; Woolfolk et al., 1990). For example, if teachers have decided to use technology to guide students on a path to success, the intention is there, but they might not be able to

fully execute a lesson if they are not confident in how to do so (Dunn & Rakes, 2010; Pajares & Schunk, 2001). In order to fully comprehend how teachers will integrate technology, it is vital to look into the teacher's mind and see how it is influenced cognitively (Dunn & Rakes, 2010).

Teachers tend to integrate technology based on how they feel about technology and how open they are in using and teaching with it in the classroom (Scherer et al., 2018; Song, 2018). If a teacher feels confident utilizing technology, then integrating technology will be easy (Moore-Hayes, 2011). Studies found how teachers and their self-efficacy are similar when it comes to how they view their capacity and readiness to teach and engage students when integrating new innovative ways of teaching (Moore-Hayes, 2011). In addition, studies show that teachers' self-efficacy is highly influenced at the beginning of their teaching career, where everything is new (Moore-Hayes, 2011; Tschannen-Moran et al., 1998). Teachers have a desire to teach; however, meaningful instruction is hindered by the lack of resources that are available to them and the time needed to implement them (Moore-Hayes, 2011). Education at the university and district levels is responsible for preparing teachers to teach with technology in the modern classroom (Moore-Hayes, 2011).

Technology is one of the continuous challenges encountered by teachers when they attempt to integrate it into their daily instruction (Moore-Hayes, 2011; Wang et al., 2018). Moreover, research indicates that technology integration continues to be questioned in the classroom settings and whether its purpose is useful to students and their learning (Moore-Hayes, 2011). Also, studies conducted in the past have found how teachers and their efficacy levels are challenged when integrating technology into daily instruction (Moore-Hayes, 2011). However, these studies showed that teachers lacked

self-trust when planning a lesson or teaching a lesson where computers could be used (Moore-Hayes, 2011; Wang et al., 2018).

Technology and teachers do not always go hand in hand, but that does not mean that it cannot work. In order for technology to be integrated successfully, teachers should know how to operate it (Alenezi, 2017). Teachers are the ones in control of their classroom, and their full commitment is needed and valuable for integrating technology into the classroom (Alenezi, 2017). Being acquainted with technology is not enough for teachers to be in a position to successfully integrate technology into daily lessons (Alenezi, 2017; Mueller et al., 2008). For teachers, learning new tools to facilitate learning for students can be exciting but unpleasant due to the lack of self-trust and knowledge in acquiring resources (Alenezi, 2017; Bingimlas, 2009).

### **Culturally and Linguistically Diverse Students**

Schools are becoming increasingly more CLD (Douglas-Horsford & Sampson, 2013; Frey, 2015; He et al., 2014). Currently, the student population in the United States is more diverse than ever before (Yoon et al., 2016). Therefore, CLD students have become the majority in many school communities across the United States (He et al., 2014). It is projected that, by 2035, 50% of the student population will be CLD (Ortman, 2012). In many states, CLD students are currently the majority of the population. For instance, during the 2010-2011 school year, 70% of students in a school district in Texas were ethnic minorities (Texas Education Agency, 2010). Additionally, in 2011, 50% of students in Texas were Black (Ortman, 2012).

The CLD population includes students from a variety of races, languages, and socio-economic backgrounds (He et al., 2014; Reese et al., 2018). However, English-language learners compose a significant number within this group of students (He et al.,

2014). Unfortunately, the dropout rate among English-language learners is significantly higher compared to other student populations (Reider & Wooleyhand, 2017). African American students are another subgroup within the CLD population who are encountering academic achievement disparities as a result of the lack of culturally responsive teaching (Charity-Hudley & Mallinson, 2017). In most states, African American students are more likely to drop out compared to Whites (U.S. Department of Education, 2019).

As the student population continues to become more CLD, it is imperative for teacher preparation programs to adequately train prospective teachers on how to effectively provide education to CLD students (Lohfink et al., 2011). However, teacher preparation programs are not effectively training teachers to address the needs of CLD students (Berg & Huang, 2015; Lohfink et al., 2011). Moreover, significant numbers of teachers in the United States feel that they are not appropriately trained to work with the CLD student population (Berg & Huang, 2015; Charity-Hudley & Mallinson, 2017). The researchers attribute this to the lack of training they received when enrolled in their teacher preparation program (Berg & Huang, 2015). In addition, research findings indicate that teachers are implementing technology into their instruction but find it difficult to effectively implement it when working with CLD students (Musti-Rao et al., 2014). It is also vital to note that, when working with CLD students, teachers cannot assume that students know how to utilize technology (Musti-Rao et al., 2014).

### ***Culturally Responsive Education***

Culturally responsive education is the key to effectively address the educational needs of CLD students (Charity-Hudley & Mallinson, 2017; Villegas & Lucas, 2002), especially because there are significant achievement gaps among CLD students as they

are underperforming compared to their non-CLD peers (He et al., 2014; Southerland, 2012). Most importantly, these gaps are attributed to the unequitable access to educational opportunities (He et al., 2014; O'Sullivan, 2015). Culturally responsive education includes creating an inclusive learning environment in which all learners can succeed by setting high expectations (Reese et al., 2018; Villegas & Lucas, 2002). Culturally responsive education allows educators to create an environment in which all learners have equal educational opportunities so they can ultimately succeed academically regardless of their backgrounds (Gay, 2013; Villegas & Lucas, 2002). However, creating an inclusive learning environment is often hindered by teachers' perceptions and low expectations (Reese et al., 2018). Furthermore, misconceptions and personal biases that educators may have influence their ability to implement culturally responsive learning environment (Charity-Hudley & Mallinson, 2017).

Creating a culturally responsive learning environment requires teachers to value students' cultural differences (Lohfink et al., 2011). This includes teachers challenging stereotypes and racism (Gay, 2013). To accomplish this, teachers need to address biases that may exist (Reese et al., 2018). It is challenging to create a culturally responsive learning environment as teachers need to create culturally relevant lessons (Bottoms et al., 2015), a skill that teachers feel they are not adequately trained to effectively implement (Berg & Huang, 2015; Bottoms et al., 2015). To create a culturally responsive learning environment, teachers must also integrate students' background, language, and cultural practices (Lohfink et al., 2011). Teachers who effectively implement culturally responsive lessons not only understand their students' culture, but they also respect it (Washburn, 2008). Moreover, teachers who implement a culturally responsive learning environment promote equity and student engagement, which ultimately results in

increasing student academic achievement (Charity-Hudley & Mallinson, 2017).

School communities with high CLD enrollments encounter many challenges in accessing high-quality educational materials. For instance, Gay (2013) indicated that schools with high CLD enrollments are usually in communities that receive substantially less funding, impacting students' access to technology and other resources. Montiel-Overall (2010) asserted that school communities with high numbers of minorities have a lack of resources, including technology. Moreover, CLD students are underserved in schools across the nation, and this is mostly attributed to the lack of cultural and linguistic competence from teachers (Charity-Hudley & Mallinson, 2017). Additionally, for many CLD students, school might be the only place they have access to technology (Musti-Rao et al., 2014).

### ***Culturally Responsive Education and Technology***

A means to create a culturally responsive learning environment is the use of technology (Reinsfield, 2020). It is crucial for teachers to select software and technology that is culturally sensitive (Musti-Rao et al., 2014). In addition, teachers who possess the skills to implement and use technology make it easier to incorporate it into the curriculum and lessons, which provides students with adequate resources outside of the classroom (Gay, 2013). However, when implementing technology in a culturally responsive learning environment, teachers must take into consideration the strains that come with it (Reinsfield, 2020). Lastly, technology is a valuable instrument, particularly when it comes to English-language learners and the variety of ways they can receive data (Gay, 2013).

### ***Benefits of Integrating Technology With CLD Students***

Technology can be utilized during instruction to promote academic achievement

of CLD students. However, it is vital to understand technology should be utilized as a means to reinforce students' learning, and it should not be replacing direct instruction (Musti-Rao et al., 2014). Within the benefits of utilizing technology with CLD students should include the following: active student response, individualized and differentiated instruction (Berg & Huang, 2015), increased motivation, and resources for classroom management (Musti-Rao et al., 2014). Technology also promotes the language acquisition process of ELs in an engaging and meaningful way (Lopez-Estrada et al., 2019).

### **Limitations of the Literature**

There is limited research on the application of theory in learning technology (Phillips et al., 2012). For educators, learning how to integrate technology and how students learn from technology, involves a lot of different backgrounds in terms of controlled behavior (Phillips et al., 2012). Even with the abundance of technology accessible to new and experienced teachers, many do not know how to effectively determine which technology tools will best suit CLD students (O'Hara & Pritchard, 2008). The absence of knowledge effects teachers' attitudes by leaving them disheartened, which results in affecting CLD students with disabilities that continues to be part of the digital inequity seen in many kindergarten to Grade 12 schools (O'Hara & Pritchard, 2009; Prince, 2017; Pritchard & Monroe, 2002; Rankin & Brown, 2016).

A significant number of teachers at the national level will have CLD students throughout their teaching journey (Menken & Antunez, 2001; O'Hara & Pritchard, 2008). In addition, the majority of the CLD population will be taught by general education teachers, while many of them lack knowledge on the needs of these students (American Association for Colleges of Teacher Education, 2002; O'Hara & Pritchard, 2008).

Moreover, there will be a constant divide on how technology should be used to educate CLD students with disabilities and how to facilitate for the CLD students access and use technology in an inner-city school district (Brown, 2013; O'Hara & Pritchard, 2009).

### **Research Questions**

As the use of technology continues to increase in schools, teachers continue to encounter challenges in integrating it effectively into their daily lessons. The researcher focused on investigating the challenges teachers encounter when integrating technology with CLD students. Consequently, this research was guided by the following research questions:

1. What challenges were encountered by high school teachers in a school with CLD students when integrating technology in their daily instruction?
2. What challenges were encountered by high school teachers with CLD students when they attended professional development on how to integrate technology to improve daily lessons?
3. How does integrating technology into daily instruction enhance the academic achievement of CLD students?

### **Conclusion**

Technology continues to dominate the world and today's schools by being the main tool that is needed to accomplish many tasks. Also, in the 21st century, it is even more important for technology to be accessible to all students regardless of their backgrounds. If technology is needed for school, then it should be available to all students providing equal opportunities for all. Unfortunately, not all technology is accessible to all students because of the lack of awareness that comes with why technology is not helping all students succeed. Many believe that the school system that

serves the community has a strong base with technology integration, but what society does not understand is that the gap continues to divide those in wealthier sectors from those in poor sectors of the school district (Christensen, 2008; Hendrix, 2005; McLean et al., 2020; O'Hara & Pritchard, 2009).

Many call this phenomenon the digital divide because it widens the gap caused by technology (Mason & Dodd, 2005; O'Hara & Pritchard, 2009). The digital divide will continue to occur, while teachers are not getting adequate training to serve the diverse student population of their schools. Technology will not work the same in schools where funding and resources for teachers are lacking as they are not located in a wealthier sector. School districts need to overcome the barriers of cultural disparities that prevent schools from being successful with technology integration, especially when school personnel lack the training themselves that would enable students and staff to be successful in using technology.

## **Chapter 3: Methodology**

### **Aim of the Study**

The purpose of this generic qualitative study was to explore how teachers in a CLD high school described challenges when integrating technology in the classroom. In this chapter, the researcher describes the qualitative approach, the chosen generic qualitative study design, and the reason for choosing this design to answer the research questions. Within this chapter, the researcher describes those who participated in this study, the instrument used to collect data, the analysis procedure, and ethical considerations. In addition, this chapter concludes with a description of the validity and integrity, the potential research bias, and limitations of the study.

### **Qualitative Research Approach**

A qualitative methodology to research was conducted in this study. The researcher conducted an indepth investigation of the research problem; consequently, a qualitative study was the most adequate, according to Creswell (2015). Furthermore, the researcher was able to explore the variables given in order to understand the perception of those interviewed (Creswell, 2015, 2016). The researcher took into consideration the research questions to choose the generic qualitative inquiry approach. Generic qualitative inquiry is considered an efficient approach to a qualitative study and perhaps the best approach for scholars and dissertations (Creswell, 2013, 2015). Moreover, a generic qualitative approach is straightforward, and no prior experience is necessary (Creswell, 2013; Fraenkel et al., 2012; Smith et al., 2012).

The researcher's vision of the study required a generic qualitative study. This is essential as researchers should study their vision prior to determining if a generic approach is suitable (Creswell, 2015). The researcher believed that CLD students were

often not receiving equitable access to education, and this included not having access to high quality technology. Consequently, the researcher wanted to study the challenges teachers encountered since she had observed schools with an affluent student population having high-quality technology; however, when visiting schools within the county that have a high number of CLD students, she observed how classrooms did not possess the same high quality new technology.

Generic qualitative research “investigates people’s reports of their subjective opinions, attitudes, beliefs, or reflections on their experiences, of things in the outer world” (Creswell, 2015, p. 78). Furthermore, generic qualitative inquiry is not committed to a specific methodology; however, this does not mean that the researcher needs to have a specific viewpoint. When conducting a qualitative study, a researcher must have a conceptual foundation, especially as it pertains to a person’s view of the world (Creswell, 2015). Qualitative inquiry is effective when the study focuses on external and subjective opinion (Creswell, 2015). For instance, generic qualitative inquiry is focused on personalized opinions and experiences, and external validity (Creswell, 2015).

This study examined the challenges teachers encountered when integrating technology in a high school with a high CLD student population. Therefore, the researcher sought understanding of what occurred in this school when integrating technology. Consequently, the researcher utilized the social constructivism interpretive framework. Social constructivism allows researchers to “look for the complexity of views rather than narrow meanings into few categories or ideas” (Creswell, 2013, p. 24). Through this framework, the researcher gathered data of the participants’ meaning of the situation. The purpose of this qualitative study was to explore how teachers described the challenges when integrating technology in a CLD high school. Therefore, a generic

qualitative study was the best to conduct this study as it gained a deeper understanding of the challenge's teachers encountered when integrating technology in a CLD high school.

### **Research Site Profile**

This research was conducted at a school offering a continuation program. There were approximately 150 students, and 78% were identified as CLD students. Furthermore, 62% of the students received free or reduced-price lunches and were identified as being economically disadvantaged. In the 2019-2020 school year, 88 of the students received ESOL services. In addition, 33 students were identified as special education students, and 11 were also identified as ESOL, making them dually identified students. Languages represented at this school included Spanish, Mam (indigenous dialect from Guatemala), Russian, Arabic, Amharic, Bengali, Urdu, Mongolian, and Albanian.

### **Participants**

#### ***Background***

The researcher interviewed eight full-time certified teachers in the state of Virginia. Teacher participants had at least 5 years of experience and integrate technology into their instruction. The chosen participants were teachers from different subject areas, such as mathematics, English, history, physical education, and ESOL. Each participant participated in a one-on-one virtual interview. Teacher participants were chosen by purposeful sampling. According to Patton (2015), purposeful sampling is the most utilized for qualitative studies as participants are chosen based on their knowledge and expertise. The researcher also indicated that this allows for more rich and indepth information about the phenomenon being studied (Patton, 2015). The educational researcher interviewed teachers to examine their challenges when integrating technology

into their daily instruction when working with CLD students.

After obtaining approval from the Research Review Committee from the target school district and Nova Southeastern University's Institutional Review Board, the researcher contacted the principal of the target school, the school in which the study was conducted, and obtained a list of teacher participants who met the inclusion criteria and their contact information. The researcher then shared with the principal the purpose of conducting the research, research questions, and additional pertinent information about the study. Additionally, the researcher requested to conduct a brief meeting after school with teachers who met the criteria for participating in this study with the purpose of recruiting possible teacher participants. During this meeting, the researcher shared a PowerPoint with the essential information related to the study, including the purpose, the research design, the requirements, and expectations from the participants. The researcher also shared the consent forms that explained the study in further details.

After the meeting, the researcher e-mailed teachers who attended and expressed gratitude for their time. The researcher also informed teachers that they had a week to decide if they will partake in the study. The e-mail included the consent form and the PowerPoint utilized during the meeting as attachments for further analysis. The researcher also stated in the e-mail that if they decided to participate in the study, they needed to sign the consent form and return it via e-mail to the researcher. After a week of sending this e-mail, the researcher had eight teacher participants. Therefore, there was no need to follow up with other potential candidates. Most importantly, the researcher provided a copy of the signed consent form to each participant before initiating the interview.

Eight high school teachers participated in this study. Teacher participants (a) were

working full time, (b) had over 5 years of teaching experience, and (c) integrated technology into their daily instruction. The researcher obtained a list of teachers who met the criteria from the principal of the school. Teachers participated in an approximately 60-minute face-to-face interview via Zoom, as we were in the coronavirus pandemic. However, one interview lasted 90 minutes. Interviews were conducted after school or during the teachers' planning periods. To examine the challenges that teachers encountered when integrating technology in a school with a high CLD student population, a generic qualitative approach was selected. The researcher conducted individual teacher interviews via Zoom. Eight high school teachers participated in this study (see Appendix A). Most importantly, pseudonyms were assigned to teacher participants to protect their identity.

### *Participant Summaries*

Rosie was born to Puerto Rican parents in Killeen, Texas, and was fluent in Spanish. Rosie earned a doctoral degree in education and specialized in providing high quality education to all students, especially CLD students. At the time of the study she held a certification in ESOL and Spanish K-12 and is a National Board Certified teacher. She had been teaching ESOL for 20 years and had been in the county for 6 years. Rosie indicated that she utilized technology every day.

Debbie was a 48-year-old Caucasian teacher with a Master of Arts degree in Curriculum and Instruction. In addition, she was certified in Social Studies (Grades 6 to 12) and had been teaching for 25 years. This included teaching overseas in countries that included (a) Doha, Qatar, and (b) Dubai, United Arab Emirates. Debbie integrated technology every day into her daily lessons. At the time of the study, she was teaching two sheltered (only English-language learner students) history classes.

Emily was a 33-year-old Caucasian mathematics teacher with an undergraduate degree in prekindergarten through Grade 6 education and a master's degree in teaching English as a Second Language (ESOL K-12). She had been teaching for 10 years and was working on an associate's degree in science with a specialty in math. Emily had been using technology in her daily lessons almost every day but had found over the years that the students who used iPads were more independent when accessing independent work. Most importantly, Emily was fluent in Spanish and indicated that she utilized it when needed to make content more comprehensible.

Suzanne was 50-year-old Caucasian economics teacher with a bachelor's degree with a focus on economics and political science. Suzanne continued her education and received a master's degree with a concentration in economics. In addition to her undergraduate and graduate work, she was certified to teach prekindergarten through Grade 12 and social studies for Grades 6 to 12. In addition, Suzanne was certified in ESOL and in English. She had been teaching for 5 years at the high school level; she previously taught for 15 years at the college level.

Jen was a 44-year-old Asian Korean special education teacher with 23 years of teaching. She received a bachelor's degree in psychology and a master's degree in teaching with special education from the University of Virginia. In addition, she had a certification in specific learning disabilities and elementary education. Jen was integrating technology into her daily lessons three to four times a week. At the time the study was conducted, she was coteaching a math class and two science classes that had a high number of CLD students.

Nancy was a 64-year-old Caucasian physical education teacher with a bachelor's degree in physical education from the American University in Washington, D.C. Nancy

continued her education at George Mason University, where she received her master's degree in education. Additionally, Nancy was certified in health and physical education for prekindergarten through Grade 12 and had a total of 20 years of teaching experience. She was also integrating technology into daily lessons about three to four times a week prior to the COVID-19 pandemic and every day during the pandemic.

Wanda was a 73-year-old African American English teacher with 24 years of teaching experience. She had a Bachelor of Science in education and a Master of Arts in communication. Wanda was certified in English and special education. Of the 24 years of teaching, four of those were spent teaching in Cleveland. Wanda integrated technology every day into her lessons. At the time of the study, she was teaching sheltered English with an ESOL teacher.

Leslie was a 49-year-old Middle Eastern, Russian, German, and Caucasian science teacher with a degree in microbiology and a minor in chemistry. Leslie held a license in clinical microbiology for Grades 6 to 12 and was certified to teach earth science and biology. Moreover, she had taught in both the public and private sector for a total of 10 years between the two. Leslie integrated technology before and during the COVID-19 pandemic.

### **Data-Collection Tools**

The researcher developed an interview protocol (see Appendix B) as the data-generating tool for this qualitative study. According to Kvale (2008), an interview protocol is essential to provide structure to the interviewing process. The interview protocol was developed by the researcher utilizing research related to the integration of technology in the classroom and teacher efficacy when utilizing technology. The researcher also elicited feedback from two experts within the field of technology and

education to complete the design of the interview protocol. Once the experts provided their feedback, the researcher adjusted following their advice. In addition, the interview protocol was validated to certify its trustworthiness and reliability. This portion of the process is fundamental to establish trustworthiness and reliable data (Creswell, 2015).

The first expert, Michelle Marrero, had 18 years of experience in ESOL with a doctorate in organizational leadership. In addition, she was employed as an ESOL coordinator by the district in which the study was conducted. Furthermore, she was an adjunct lecturer for Georgetown University. She also served as an advocate for equitable educational opportunities for CLD student population. The second expert, Ivette Colon, worked for a neighboring county as an ESOL teacher. She had been in this role for over 30 years and had provided support to teachers across the county on how to effectively implement technology into their daily instruction when working with CLD students.

Once the adjustments were made, the researcher applied for university approval and ran a pilot test of the interview protocol. A pilot test was crucial as it ensured the trustworthiness and reliability of the data collecting tool (Creswell, 2013). Consequently, the researcher interviewed two teachers independent from those who were recruited for the actual study, using the interview protocol. The researcher took notes of teachers' responses to certify questions were appropriate and prompted the interviewees to give feedback on the interview questions. Changes were not made to the interview protocol as results of the pilot were successful.

## **Procedures**

The researcher obtained permission to conduct the study from the SPPS (pseudonym used to protect the district) Review Board Committee and Nova Southeastern University's Institutional Review Board. Once granted permission, the

researcher contacted the principal of the target high school via e-mail and requested the names and contact information of teachers who met the inclusion criteria. Then the researcher scheduled a virtual meeting with the principal and teachers who met criteria. At this meeting, the researcher explained in detail the purpose of the research and the requirements for the selection of teacher participants. After the meeting, the researcher asked the principal for permission to access teachers' internal e-mail addresses as she was an active teacher at the research site.

Once the principal approved this, the researcher e-mailed teachers thanking them for listening to the presentation and invited them to participate in the study. In addition, the e-mail included the PowerPoint used during the presentation explaining the purpose for conducting the research, research problem, research questions, and criteria for possible participants. The consent form that teachers were required to sign if they accepted to participate was also included on the e-mail. Due to the COVID-19 pandemic, the consent forms were e-mailed to teachers, and they returned them signed via e-mail before their interview. For those who accepted the invitation for participation, the researcher scheduled a time to conduct the individual interview. Interviews were held virtually through Zoom because of COVID-19 during after-school hours and during the teacher participants' planning times. In addition, the researcher took additional notes using the interview protocol for more accuracy of the data.

### ***Data Collection***

Once the researcher had eight teacher participants, she contacted each via e-mail and scheduled a time for the one-on-one virtual interview. The researcher reminded each teacher that interviews will be conducted after school or during their planning time to minimize interruptions. Before each interview, the researcher asked each teacher

participant to e-mail the signed consent form. During each interview, the researcher took detailed notes on the interview protocol and audio recorded each interview utilizing Zoom's recording feature. Audio recording and taking notes are crucial to accurately interpret the data (Creswell, 2015). After each interview, the researcher e-mailed the Zoom recording to a professional transcriber who transcribed each interview within 48 hours. After receiving the transcriptions, the researcher e-mailed a copy to each teacher participant to check for accuracy.

### ***Data Analysis***

After receiving each interview transcript, the researcher began the data analysis process utilizing Saldaña's (2015) coding manual for qualitative researchers. First, the researcher read each transcription twice and took notes (memoing) while reading of initial thoughts to maintain accuracy, consistency, potential bias and to utilize for future reference. Additionally, the researcher took notes about the most important points made by the participant. These analytical memos served as a means to identify potential codes. Then, for each interview transcript, the researcher began to code manually and identified them with a word or short phrase. Then, the researcher reviewed the codes and identified them as descriptive codes in yellow, emotional codes in green, eclectic codes in blue, and in vivo codes in pink. The researcher created and utilized a coding manual (see Appendix C) to organize the data and to facilitate the data analysis process.

During this process, the researcher also took notes on the rationale for each code. Next, the researcher looked for patterns and grouped codes into categories. During this step, the researcher utilized a graphic organizer to facilitate the process. After repeating these steps for all transcripts, the researcher placed the information from the eight transcripts on a spreadsheet and identified commonalities amongst the analyzed data from

each one. Then, the researcher analyzed the data and identified themes. Once the themes were developed, the researcher organized them into a matrix and added significant quotes from each transcript that depict the theme.

### **Ethical Considerations**

First, the researcher received approval from the Institutional Review Board of Nova Southeastern University and the target school district. The researcher considered future participants as she informed them of their rights and received consent before conducting the study. The e-mail that participants received included the intended purpose of the study and expectations during their participation. For example, teacher participants signed consent forms which provided the researcher permission to interview and audio record utilizing Zoom. In addition, the researcher used their demographic information for data purposes.

Second, the researcher protected the information of participants by following ethical protocol (Creswell, 2013). The preapproval of the Institutional Review Board from both institutions was crucial in order to protect the rights and safety of the research participants. The purpose of obtaining Institutional Review Board approval was for the institution to guarantee the study to be conducted protected participants and employees of their institution and that they were not by any means subjected to any harm, the research questions met the institutions approval, and that no participant were violated of their rights. Therefore, the researcher kept participants' personal information, safety, and rights confidential. Most importantly, anonymity of participants was kept to protect them. The researcher accomplished this by keeping participants' identities confidential by utilizing pseudonyms.

**Trustworthiness**

To maintain trustworthiness, the researcher used data triangulation. Through triangulation, the researcher was also able to establish validity, which, according to Yin (2018), is crucial to establish validity. First, the researcher utilized different sources of information to increase validity of the study. For instance, the researcher compared the data from the interviews with current research. In addition, the researcher established validity of the interview protocol because it was reviewed by two experts in the field of technology, qualitative research, and education. Most importantly, the interview protocol was piloted with two individuals independent of the study. Moreover, the researcher shared the transcriptions with each teacher participant to establish its accuracy.

**Potential Research Bias**

The researcher refrained from any preconceived notions and allowed herself to see things from a new perspective: the participants. Consequently, the researcher maintained a journal in which she utilized to reflect during the study. Through journaling, the researcher was able to identify and manage potential bias that arose during the research study. Last, to also identify potential bias, the researcher had experts review the study's analysis and findings. The researcher was a teacher with over 5 years of experience, where she had taught students the subjects of World Language and ESOL. The researcher had used technology in the classroom and outside the classroom for developing education curriculums. Therefore, the researcher's outlook on educational technology was extensive. The researcher had taught in classrooms where technology was not integrated and in classrooms where technology was not only integrated in the classroom, but students were also given a personal device by the school district to use for learning purposes. The researcher had participated in numerous workshops that had

contributed to the researcher's knowledge in using technology for instructional purposes.

Outside of the classroom, the researcher used technology for personal purposes and to communicate with others on a local, national, and international parallel. The researcher's experiences with technology had been positive and negative, where those experiences have contributed for the researcher to see the pros and cons of using technology in different settings. The successes and challenges of the researcher were what prompted the researcher to investigate how other teachers have succeeded or endured challenges in the process of integrating technology in the classroom. Therefore, it was important for the researcher to refrain from the current beliefs regarding technology integration in order to obtain an unbiased outcome from the participants.

### **Limitations**

Any type of research study entails limitations, as no one study is designed perfectly (Creswell, 2015); therefore, this study also had limitations. In this qualitative study, the researcher sought to find the challenges teachers encountered when integrating technology with CLD students. A limitation of the study was that teacher participants were currently teaching virtually because of COVID-19, and this had caused significant challenges, including stress associated with this new form of teaching. In addition, interviews were conducted via Zoom rather than face to face as originally planned, and, although teachers were interviewed during their planning period or after school, there were many interruptions from the participants' children.

### **Summary**

Chapter 3 provided a detailed account of the methodology and procedures that will be used to conduct this study. A generic approach was used, as this study explored how teachers in a CLD high school described the challenges when integrating

technology. The eight participants of this study were selected through purposeful sampling. Furthermore, the researcher described the development of the interview protocol that was utilized as a data-collection tool. The researcher interviewed teacher participants, and audio recorded each interview, and transcribed them. The researcher also provided research on the data on how the data were analyzed. Last, the researcher provided the ethical considerations and potential research bias that were addressed.

## Chapter 4: Results

This chapter will present the research findings from a generic qualitative study that was conducted in a high school with a high CLD population. The generic qualitative study investigated teachers' experiences implementing technology into daily lessons when working with CLD students. To accomplish this, the researcher gathered data by conducting teacher interviews via Zoom. Then, the researcher will share and discuss the themes that were identified: (a) CLD students' lack of technology background, (b) CLD students' lack of technology access results in unequal access to education, (c) inadequate professional development and teacher self-efficacy, (d) extrinsic and intrinsic barriers and lack of support, and (e) technology is a hindrance to CLD students' academic progress.

### Themes

The researcher identified five themes from the data gathered from the individual teacher interviews. Themes are derived from common information that arose in the teacher interviews. The following paragraphs include applicable quotes from the participants that illustrate the identified themes.

#### *Theme 1: CLD Students' Lack of Technology Background*

CLD students' lack of technology background and skills cause significant challenges when teachers are trying to implement it during instruction (Correia, 2020). For example, some English-language learners come to the United States with limited or no formal education, and, at times, they do not have access to technology (Sayer & Braun, 2020). In this study, all teacher participants revealed that the students' lack of technological background hindered the ability of teachers to implement technology into daily instruction. For example, Debbie described this challenge as follows:

I have encountered students who would have only been in the country for a

tremendously short period of time, and the first time they used a computer was at their home school. In their, you know, their English learning classes. And those basic classes that do not teach computer literacy. So, when they arrive here, students encounter challenges with even login to the different platforms....A large majority are English-language learners, some of whom have not been in the country very long at, and all of the sudden are expected to do everything on a MacBook.

Similar to comments made by Debbie, Rosie related her encounters with this topic in the following statement:

It is challenging to have students not know how to use a computer, but it is not their fault. They were students who came to this country without a strong educational background. Therefore, when they enter a U.S. school, they are given these devices without the school telling them what they are and why they are giving that device to them. At times, students don't even know how to turn it on. It is very complex because you can't give a class and ask students to go to GoogleDocs, and then it takes about an hour to get all students to open a GoogleDoc....There are many English-language learners who arrive with no formal education and therefore had not have access to computers. So, when they enter our school system, they don't know how to use computers.

Emily provided additional details of the type of lack of foundational skills students possess when they enter her class in the following comment:

Lack of experience....That is definitely number one. I had a student who didn't know how to work a mouse or didn't know how to use a touchscreen or understand how to click on a specific thing to open it. That's a lot to learn and is

more challenging when the students are in a new environment. You know, maybe they have been in this environment for a while, but they are clearly not comfortable with it yet...during instruction. But for the most part, the students like really like struggled with technology because they have so limited experience with it, they don't understand they can't keep up, so, they just sit there.

Six participants shared that the lack of foundational technological skills was not the only challenge that students encountered; they did not have basic vocabulary skills related to technology, which caused additional barriers when teaching. Suzanne explained how students did not know the vocabulary related to technology in the following statement:

Not every kid is comfortable with that and I think is especially true for like the English-language learning kids where, you know, maybe they didn't grow up with a laptop or computers. I say that flamingly, but yeah, as basic as vocabulary down related to technology, they just don't have it. For instance, if I asked them to minimize a screen, they do not have knowledge of that. For many of them, it is their first time having a computer for the first time.

The students' lack of technology vocabulary background created additional challenges as students did not understand the instructions related to technology when teachers provided them. Nancy described these challenges as follows:

Some students do struggle; you know with sharing their screen. So, students struggle with simple instructions like minimize your screen. When you say, this some don't know what you are asking. Also, if I say you know, I want you to look at a particular video. I give them the video. Here's the link, and they sometimes struggle. They say, I can't. I can't find the link, or I see the link, but I can't get in,

but so, how do I do that? Again, it is walking them through, just to see is it just something on their end or is it something on my end?

Jen also depicted challenges she encountered when providing instructions to students utilizing vocabulary related to technology. According to Jen, as she provided step-by-step instructions to students, they said they were following the steps; however, in reality, students did not understand the instructions because they did not complete the assignments. She described this in the following comment:

So, and I would ask them, can you submit the assignment? And you know, we think that is so easy, but because we have always done it. But even today, we give them step-by-step instructions such as, you got to download this document, hit file save as, save it to your desktop and then type yourself a note and you got to hit save and now you have to upload it. It's a lot of language in which we take for granted that the kids know or understand what those words mean. And I can just imagine the other kids sitting on the other side of the computers going like aha, yea, aha, yep and then shutting the computer and is not in and then we are like, well why didn't you turn it in?

In addition, Rosie described a challenge that often occurred when students did not have the technical vocabulary related to technology. She explained her students' challenges in the following statement:

Students get frustrated a lot, especially when I give instructions with words like desktop, browser, minimize, use your mouse, create a folder, and so on. Last year, when we were forced to go online because of COVID, it was so hard because you would ask students to download a file and save it to the desktop. First, they didn't know what download is and second, they didn't know what desktop was. When I

gave these instructions, they would look at the screen and just stared at it. So, there were times that I would ask to share their screen and they are like, what is that? Then, I would share my screen and modeled each step and would highlight each vocabulary. For instance, I would say, download the document. Download means this...So, I found myself teaching students a lot of that vocabulary so they can understand simple instructions so they can ultimately complete their work and have access to the class. This takes way too much time from class, but it is necessary to do because if not, students will not be able to complete their work or participate in class.

Debbie, Rosie, Emily, and Leslie made suggestions about how to address the lack of literacy skills of students who arrived in the country without any technological background. For example, Leslie made the following suggestion:

I think that a course should be required for students at the elementary level and work on up and at the middle and high school levels, as the students funnel especially those students who are English-language learners and are coming to our county and to our school system for the first time....I think that's an early requirement like that needs to be immediately be inserted into the class schedule. Things, you know, that they can learn how to use like how to use Word, Microsoft Office, for example. They must have the basics on how to navigate a desktop. Most of our English-language learners cannot understand how to navigate, and we really get delayed because we think as teachers that students know how to navigate those things...and they don't, they just don't. I think that we have to have a course that implements that. Not as an elective, but as an immediate and early requirement every time somebody new comes in.

Rosie also described the need for a fundamental technology class in the following statement:

There are so many things but let me speak about the ones that I believe are the most imperative. First, when English-language learners enter the school system, it is crucial for them to be in a fundamental technology class...When they enter, they should be given a computer fundamental class that students can learn the basics such as how to create an e-mail, basic vocabulary about technology, how to use a mouse, ah how to attach documents, and so on and so on.

Wanda indicated that it was essential to teach students vocabulary related to technology when she stated the following:

You would have to teach vocabulary related to technology as if you would teach an English lesson about a particular piece of literature or a piece of non-fiction, you would have to actually teach. For instance, if I want them to minimize the screen, I would have to teach that term to the students.

Within this topic, Emily indicated that content teachers, who were often not trained to teach technology, were spending a significant amount of time in teaching technological skills, and it was impacting their ability to cover the content of their subject. She also suggested the creation of the foundational technological class and described this challenge as follows:

If there is a way a student can have a foundational exposure to the basic use of technology before seeing my content scenario, I think that that would help so much. One because I don't have to lose content time to teach technology. And two because a lot of times the ability to teach content in my experience is impacted greatly by a student's confidence and willingness to take academic

risks...That's already challenging to teach a subject that they may not be exposed to very much. They may have already exposed to, but decided that they hate it, or had traumatic experiences with their past education...If I have to teach the technology first, (pause) that often just creates extra frustration....So, if you can give a foundational course to students before they enter, maybe is a summer school curriculum. Maybe if they are newcomers, then, instead of throwing them in mainstream classes if they arrive from March to June. Maybe from March to June is foundational time. Very foundational language, very foundational math, very foundational technology, so when they enter, they have something to feel accomplish with so far.

Additionally, Jen explained how some English-language learners would change the computer settings in their native language (i.e., L1), and this provided some support to some students. She illustrated this accommodation in the following statement:

Well, I have seen a lot of students who have these setting in their computers to have them in the language that they know best, and which is awesome because it is giving them some type of access. I mean, at least they are understanding what some of the words mean, because I would be like file, and they will say, what do you mean file? You know, or save, so, I think that way, it's good and I do know that the language of technology is so complex and there are so many translating tools they can look things up. I like Google translate, so there's some understanding of what goes on.

On the other hand, Rosie indicated that changing the computer settings into students' language often would cause additional challenges, as she could not provide the appropriate support because she did not understand the settings in other languages. She

expressed the following:

At times, students, especially English-language learners, would change their settings into their first language. However, this causes more problems, even if the setting is in Spanish as I know Spanish. It is more difficult because I am not familiar with that vocabulary and can't effectively guide students. Also, when I am providing instructions, I am showing students through the Smartboard step by step on what to do and my settings are in English, so it is difficult for them to follow me because of the differences. To make matters more complicated, many of our students come with limited or no formal education from their country, so even if they have the settings in Spanish, they really don't know what they mean or what their function is. This is because of the lack of background knowledge.

Seven teachers indicated that it would be beneficial for the school to conduct a survey to all students to inquire about their technological skills, so they could have data on how many of the students had technological backgrounds. For instance, Debbie stated:

I think the first thing you need to do is find out where everybody is at...some of it would be in form of a get to know your questionnaire that they would answer questions about what you know of don't know how to do in the computer... but, just as simple as the background information that you would want on a student, so like your name, where are you from, where were you born? What is your home school? Which is obviously for my unique school. What is your comfort level? Do you work? How many hours a week do you work?

***Theme 2: CLD Students' Lack of Technology Access Results in Unequal Access to a Full Education***

All nine teachers provided details of these inequities and how CLD students,

especially English-language learners, were hindered in their academic progress. Wanda stated, “With the pandemic, we can see an increased number in educational inequities especially for English-language learners and those who are economically disadvantaged.” The challenges negatively impacted the students’ ability to access or enter their classes. For instance, Jen explained these inequities in the following statement:

Yes, so after COVID, so, during the virtual, I think that the biggest challenge has been having kids take like their Internet connection has been the biggest issue. I mean they are working and suddenly they drop out and we are like where did you go? So, sustaining the Internet connection has been very difficult...a secure connection and not even a connection. It has to be a connection that is powerful enough that it will take all of the things that we are asking students to do...Right, and then and then, it’s like especially for, I mean I there is a huge equity issue between have and have not and that’s not ok. We want education to be an equalizer. And it’s putting them placing them in a huge dis service for they have a limited bandwidth and then you have them like have three kids trying to use the same Internet connection, and who is it going to get it? You know?”

Debbie provided more details in the following statement about connectivity issues encountered by students because of the lack of Internet access:

Yes, so you would have some students that clearly have computers at home and their father works in information technology (IT), and this was not a problem at all and then you have somebody who didn’t have Internet access or with unreliable internet access, and then you are losing them fast and the furious. The learning curve was tremendous for those students behind, and I fear that that was hugely intimidating and frustrating for some students understanding by so. The

first week of school, there were connectivity issues with the county's issue devices. Therefore, the only students who were able to make it to class were those who had personal computers.

Leslie agreed with the existence of inequities in education; however, she also described other types of inequities that English-language learners encounter. She explained these as follows:

Technology, viewing it, there are many different platforms, and we have many English-language learners who do not have access to health and Internet, and those are also something that really needs to be considered. I have students who really have struggled with tech issues, and technology means and headaches and things like that, and that's not addressed often in those types of environments with students and those families because they don't have the same access to educational and health services.

Rosie described similar challenges as she stated the following:

Well, technology is definitely impacting learning. Now, is it impacting CLD students in a completely positive way? I am not too convinced. I think that at times, they well, their academic growth is limited with technology. Before the pandemic, well CLD students, yes they have a device, but there were so many issues with students not being able to login or use it effectively or appropriately and when they tried to find help, nobody could help them because of the language barrier or because of lack of access to a tech person, which is an inequity because it is easier for general education or students who are fluent in English to find assistance.

This impacted their access to education....I think that if the county had

rolled out the one-on-one devices differently, I mean in an organized way, this would have minimized all the challenges students had at the beginning of the year. I mean, it was a disaster and for the CLD population it is super important to have everything run smoothly. If they encountered situations or challenges with technology, I found that they shut down and begin to get unmotivated. For example, I have one student that her laptop would not let her access the Internet from home. We asked her to come to school at a certain time, and well, the tech guy would work on the computer. Once she got home, the computer would not work. So, she was asked to come to school once again, she did, IT would “fix it,” then, she would go home, and it was still not working.

I felt so bad for the student. I felt bad for the students because she had to take time from work to come and do this. She actually went to get this fixed five times. I was frustrated as the student is a responsible and-diligent one and worries for her grades. However, because of this situation, she struggled at the beginning of the year because she didn't have access to the content. Of course, as an alternative school, and-and because it is right, teachers had to work closely with her so her grades could increase. Basically, because of the tech issues, she was negatively impacted. This is unfair as if it were a student whose parents had resources, she could have had access to Canvas and the class by using a personal computer, in which many other students with resources actually do when their school issued device doesn't work.

For years, we hear that CLD students, especially English learners, do not have the skills or sometimes access at home to Internet. I mean Internet access at home. With this said, yes, all of our students have laptops issued by the county,

but not all students have Internet at home for many reasons. So, the students if assigned a work and I mean homework to research a particular topic and let's say write a paragraph, well, many students can't do it because they don't have Internet. Teachers need to have this in mind that not all students can complete this type of homework because it requires Internet, and this is unfair for many students.

Furthermore, Rosie continued describing additional inequities that included the allocation of resources within the school district. She explained how the county provided this school with the technology and equipment that were no longer being used in other schools. She explained this phenomenon in the following statement:

But I do say that there are inequities in every sense of the word because, well, our school does not have the best technology like other schools in this county....As I indicated earlier, we get the technology from other schools, so when they arrive to our school, they were used before and do the technology often fails as it is outdated. For example, our Smartboard does not work, I would say 80% of the time, and the county's technician indicated that the reason for this is that it is old equipment. Now, during the pandemic, many students had many challenges, and this caused many disruptions from the beginning, well of the year. Well, actually, since March of last year. It was a disaster.

Students could not login to Canvas because of the county's global protect and students had to make arrangements to go to the county offices, but then because our students work and do not have cars, well this was difficult. And then, students had to make I mean schedule an appointment, and it was just so frustrating because for some students, it took them two months to fix the

problems. Other students could not login because of password problems, and to get a new password. Well, let's see was completely difficult. And the county knew from March of 2019 that a great number of students did not have access to their education.

All nine teacher participants expressed concerns that the allocation of resources was not equitable across the county, and this included not allocating a full-time IT professional in this building. This was best explained by Nancy, who indicated when she or her students needed assistance with technology, they could not find someone who could assist them because the IT person was in the school only twice a week. She explained this matter and how she addressed the challenge in following statement:

There is a need, there needs to be technology support for them. You know, sometimes you don't always have a technology person rarely able to help them when they need it. And that's have to be as far as I am concerned it's got to be a 27/7 almost for them... Right now, I have many students that have shared, Mrs. Nancy I struggle with Canvas. I don't know how to use Canvas, and I am the type of person that I will just say, alright, well, maybe, we have to learn it. Let's just see for the time being. Let's work together, it's not about seeing them being frustrated and give up. It's you know, if you can't use it, or we struggle using it, but maybe we can go a different way. Let's find a way around it.

Jen expressed similar concerns about the lack of assistance given to teachers and students by the IT department; in addition, she shared other apprehensions as follows:

You know, worst case scenario, I would call our IT guy... I don't call him immediately because he makes you look feel stupid... You know, you are like, I feel like I have to defend everything like to get to that point... Sometimes, you are

like, you know, like you press something wrong and you are like, what did I do wrong? And sometimes I also find that in the classroom, they you know, I am trying to explain what I want done and what is not working, and he never understands it...Right and you know, part of me is like you know, he gets the problems. He only gets contacted when there are problems. And people think that he can fix things right away, get upset with him when he doesn't, and so it sets this hostility between the staff and the IT person, which is not good for everyone ...not helpful either. Yes, and it takes time and usually like I mean there are some problems that you can explain and talk, but it doesn't make sense to the representative and you are like aaaahhhh! Then, the problem, they offer a solution that you have already tried that and then. You know, feel like it is a waste of my time.

Debbie shared similar concerns as Jen and Nancy, but she provided additional details on what she believed the challenge was with the IT professional by stating the following:

I don't believe our school; an alternative school receives enough support from IT. Our tech person, I think that a normal comprehensive high school will not have that problem, but at our school it appears to be a very large problem. So, things as simple as hardware or software updates seem to cause larger problems than I feel they should. So, it's just the frustration when is something I can't troubleshoot myself, and I have to get our IT involved... The individual is in three different schools and quite frankly, I don't believe this individual is as competent as perhaps he or she should be.

***Theme 3: Inadequate Professional Development and Teacher Self-Efficacy***

Teacher efficacy can be essential when implementing technology (Saxena, 2017).

However, data from studies related to the implementation of technology during daily instruction found that teachers do not feel they are adequately trained to successfully implement technology (Saxena, 2017; Vázquez-Montilla et al., 2014; Wang et al., 2015). All nine teachers provided details on the inadequate training they had received from the county and how this impacted their ability to implement the technology. For instance, Emily explained that teachers could not be effective implementing new programs and technology if they had not received training:

Teaching without knowing how to use a program, that's a big challenge. How am I going to be effective if I don't know how to use something? How can I be effective if I am using something that I don't really know how to use...Of course, every new thing we try there will be, you know, a learning curve to it. But if I don't know the basics and I am just trying to figure it out as I go along, it's not going to be effective.

In addition, eight teacher participants indicated that the training provided by the district was inadequate as it was not geared toward teachers' needs. For instance, Leslie shared the following:

The basics in entry, but I don't learn by being taught to. I have to go sit down and get Google and watch videos and go step by step and when I have to go to the next step, then I go back to watch it. So, in general those PDs are a complete waste of time and are useless for me. I just press the play button and walk away and do something else...and when we have something brand new, there is so much material and information, that it's impossible to absorb and the only way to learn it and understand it is to learn it on your own.

Like Leslie, Emily also believed that the training provided by the county was not

effective. She looked forward to training because she was always willing to learn, but she was often disappointed when she attended. Emily shared her experiences with county-wide professional development in the following statement:

So, I definitely try to strive for professional development in regard to technology. I have done yearlong cohorts that I thought would be to me very useful. Though I definitely try to educate myself with what's out there. I haven't found always useful. I still struggle to find the appropriate level of training for myself for what I need to learn as well as the appropriate tool for the type of student... Yeah, so I think there are two sides to it. So, some trainings I have taken like early on, there were trainings, they were geared towards how to use a specific piece of technology that I already knew, so that was a waste of my time. And so, it was disappointing, not just because I wasted my time fulfilling that professional development requirement, but because I was really hopeful, they were going to teach more.

Emily strongly believed that most of the county's professional development was not geared for unique student populations such as English-language learners and special education students. She explained this in the following statement:

For example, teaching in high school, I was exposed to a particular math program that the county signed up for, and it really seems like it was going to work because it was something that could be differentiated for students and personalized to meet students where they were and that sounded like it was going to be great. I was thinking that this was going to work, but as I went through the training, I found that the training is one that I can't implement in my classroom. And I tried to implement within two semesters with different students the

technology component to it but was just too overwhelming. Like learning how to log in to a system and then try to figure out how to type the answer right and all of those little details that go to an automatic system... Because I tend to work with a more specialized population, so, most of the best training out there aren't necessarily helpful to me because I can't apply them to the learners I have in class...and that's where I get frustrated because I try to find I see like great lessons and a great way to create these things and I'm like, I want to get good at that an-and I could make those types of lessons with a more typical classroom. I can get good at trying to figure out how to use it that way so I can adapt it to the population, but I don't have time to learn it this way and then to switch it down so a different type of learner can access it.

Furthermore, teachers shared that they had certain expectations before entering professional development, and when they attended it, they were often left disappointed. For example, Jen explained how one of the recent trainings she attended was not effective as it did not include the features that teachers needed to use when utilizing Microsoft Teams. She explained her feelings as follows:

I find that of all the big group training I have done, like I took the Microsoft Teams training for the virtual online teaching like in August. I had high expectations that I was going to learn and after I take that course, I was going to be able to do everything that I need to get done on Microsoft Teams. And which was not the case. So, you know, like it gave me a good overview, of what the powers of what teams can do, but like 80% of what they talked about, I wasn't going to use...and then, the other parts that I want them to go more in depth like how to use breakout rooms, or you know, the problems that came up after I began

using them and I had to figure them out were never were taught in the original day that we had. So, what for instance, like we found out that some kids were kicking other kids out teams meeting and were like, what the heck is going on? It would have been nice that at the training they would have told us that if you make them presenter like participants instead of attendee, you have the power to do that.

Well, that would have been nice to know at the beginning.

Teachers who had been in the county for a long time felt as though the training provided by the county was not effective. In addition, teachers who were late hires were not being trained to utilize the different programs and technology provided by the school district. For instance, Nancy, who was hired in mid-September, indicated she was not trained and shared her experience as follows:

I would say for me, right now is because the fact that I retired, and I came back to teaching. For example, our school system was already in the process of integrating a new technology, Canvas. I did not have the training or the course on it. I know that there was one out there, but I tried to take the course, but I struggled with that. There were so many parts to it, and I am really the kind of person that would feel better if I could work with someone who can show me how to do it. And then, give me some time to work with it. So, you know, I get a little frustrated, and I try not to show, but I certainly never give up. You know, I will work out until I do get it... Well, I am not so sure too much of on you know their fault because I came in late, but unfortunately, the course they had online for it, they were just taking it down, so I couldn't really get into it and couldn't use it for very long. And of course, you know, I wasn't there when they started you know offering classes on it for teachers to go. If I could have been there, I think you

know that I would of have been able to gain more from it.

Because teachers believed training was not effective, all nine participants shared that they frequently relied on self-teaching and collaboration with colleagues. Suzanne described her experiences with self-teaching technology and collaboration in the following statement:

...Like a lot of it was me teaching myself...but honestly, most of my Canvas knowledge was just playing around with it and you know, I talked to colleagues to, like, how do you do this? How do you do that? And you know and them telling me how to use something, so I think that I think most of it was me keeping doing it myself and maybe getting help from colleagues. Honestly, in terms of the technology, I don't think it has been SPS who has provided the training I need...there were like other different settings. Like I usually, I began like using. Well, I don't know if I was allowed to or not, but I clicked on every button to see what the menus are what like it's just trial and error. I just tried everything. Same thing with Canvas. I go, I mean, I go when I first was forced to do it, and I was like ok well, I began to watch YouTube videos and I looked for information...So, I basically taught myself how to use most of the technology required by the county.

Similar to comments made by Suzanne, Debbie indicated she learned how to use Canvas by speaking to her colleagues, as she described in the following statement:

I learned really fast because I had to. There also was great ability to talk to colleagues about what works because like I said in the beginning, I didn't realize how everything can 100% be in Canvas and a colleague mentioned that, and the gradebook option, and everything else.

Suzanne also indicated that county professional development was not helpful, but collaborating and learning from colleagues were more beneficial:

One thing that I would love is to maybe to have an opportunity for maybe teachers like within a particular area like me CTE or social studies just to get together and not be like lectured to by a person with ideas, but just sort of like a round table where teachers are sharing things that they can well, felt that worked really well in their classroom. So, then you can get ideas from teachers who are actually using the technology right now in the class. I like that idea.

Furthermore, five teachers indicated that the county would often launch programs or technology without any direction or professional development. This was best depicted by Emily in the following statement:

...And all of the sudden, that moment is always going to happen, but I feel like it continues to be where I don't feel, I don't get access to the right type of instruction on how to use technology... And, so, when the iPads were first introduced at the middle school level, we were told basically figure it out. As teachers we, went to a training, and I was like ok, great! I'm going to learn how to use it as a teacher. The training was iPad one on one. Here is how you turn it on, here is how you close an app. And I personally didn't need that training because I have already had an iPad in my life. I needed to know how to I am going to use it when I am going to instruct.

Moreover, seven teacher participants expressed their concern about how the professional development provided was not geared toward the type of students they were serving, in this case CLD students and especially English-language learners. Emily best explained this challenge by stating the following:

So, the majority of the trainings in the county are offered to the needs of the majority of the students and they expect a certain level of content understanding to as well as understanding as to how to use technology. And, so, there's so much that needs to be adapted even in any type of regular lesson, but if it's a technology, then I can't necessarily know the software of it the needs of my students. Or maybe I can adapt it, but there are few other people in this situation to collaborate with and figure out what is it that needs to be change, what have you had success with, what is definitely not working. Those types of conversations that people need to have and quicker you know, the skill to find good resources...So, sometimes like I said, they try to offer things as is either like too low level for what I am looking for or it's too difficult for a different type of class.

The lack of professional development was not the only challenge that teachers indicated they encountered, as four expressed that often the county did not provide enough time for them to effectively implement the new programs or technology. This was best described by Rosie in the following statement:

And I think that this is not so much for teachers, but for counties or school districts. There has to be strong, I mean effective ongoing teacher training on how to effectively implement technology into daily instruction. There are so many times that counties launch a new program, or I don't know, equipment without training teachers. When I mean training, I mean indepth training and that teachers can practice before implementing it with students. For instance, when Canvas became our new educational platform, it was a disaster. I work for a nearby university, and it took them 5 years to actually make the transition from

Blackboard to Canvas. But in this county, they said we will begin next year. And yes, they sort of had someone come and train us for an hour, but it was not enough and even the person who trained us said she was learning how to use it herself.

Wanda also indicated that the county often launched new initiatives without providing teachers with enough time to train and feel comfortable with the technology, which impacted her ability to implement new technology. She described her sentiment as follows:

I really have challenges with Canvas. I thought that the rollout was unprofessional from the system...We didn't have time to actually learn how to use it...We would have to call and schedule an appointment, and it was kind of random. And then she would have maybe 45 minutes to an hour. And then, she was gone. I would always feel that by the time I got access to this kind of training, we were at least 2 years into using Canvas...Canvas was introduced in those teacher days in August, and Canvas was given to us at the front at the door when we came back in August. And we were expected to use it. This is not my first, rodeo going through SPS changes...Actually, setting up the lesson in Canvas was an obstacle because, you know, when school starts, and you are co-teaching with other teachers, it is difficult because you have to plan with them, and sometimes I didn't have time to put the lessons into Canvas...I think that the training for Canvas was inconsistent and poorly run, and I felt that the lady that would come to our school to train us, she was just learning how to do it. She was not an expert.

Finally, seven teachers indicated that there was a need for effective and ongoing professional development on how to successfully implement technology with CLD

students. For instance, Wanda indicated the following:

We need more professional development for the teachers, probably outside of the classroom day. I mean, if it has to be in the summer. If it has to be, you know, I guess in the summer would be the most likely time, and having someone monitor your progress, so that if you have a problem, there would be someone there to help you, instead of having to make an appointment and put it on the calendar.

The training is critical.

Rosie also indicated that there was a need for professional development so teachers could successfully implement technology when teaching CLD students. She explained her opinion as follows:

I believe that there is a need for professional development, but when I say professional development, I mean professional development that actually is useful and that teachers can learn from. This county provides a lot of professional development opportunities, but unfortunately, I have yet found one that has been useful. We need in-depth training in which geared towards special student population such as CLD students, English-language learners, and special education students. Most of the training that is provided is for programs that we can't even use for our students. If the county wants us to implement technology, there must be cohesive training. We need more professional development geared towards how to implement technology with CLD students. This training has to include cultural competence and the reality of many CLD students because there are so many teachers that have no clue what these students go through and what types of lives they have. Like, something simple like, don't assume they can do homework in Canvas because there are students that don't have access to

Canvas... We definitely need more training.

Leslie indicated that, in addition to ongoing effective professional development, there was a need to hold teachers accountable and a means to follow up with teachers. She described this need as follows:

So, the example with Canvas I learned the very basics of Canvas, and I could understand how to navigate it but, when I had to sit down and really get to the really gritty, then I took some classes over the summertime and like I watched more a lot more videos because again, the classes were useless. I watched the videos that they provided, and I can really do Canvas now because I had to sit there and go over and over. And I tell you one thing about classes that was most valuable to me is that I had to submit assignments... So, if the county wants us to learn stuff from professional development, I will want to submit assignments that we can do, like a checklist. Can I do this? Can I put a picture in? Can I create an assignment? Those types of things would have worked. Like actually submitting the work that to proof that you can do it, then, that would be helpful. But other than just being talked to and talked, we are not absorbing anything.

***Theme 4: Extrinsic and Intrinsic Barriers and Lack of Support***

Research findings on technology have identified extrinsic and intrinsic barriers that impact teachers' ability to implement it into daily instruction (Juggernath & Govender, 2020). All nine teachers indicated they had encountered both types of challenges and provided many details and examples. For instance, Rosie described extrinsic barriers with the following statement:

Yes, there have been many challenges. But the main one is the Wi-Fi. The Wi-Fi connection is not stable, and it can interfere with class and testing. And it actually

has. For example, last year during testing; these are standards of learning which are high-stakes standardized tests. Well, it was a disaster! The poor students, well it was a mess. First, some students could not login to the network. So, at times, students would spend about an hour or more to login and by this time, well, students are nervous and have test anxiety. And then, when they come to the testing room, well they turn on the computer, but cannot access the network, and it is frustrating for them and staff. There are times that students sit in the room for about an hour or more until the issue is solved. And to make matters worse, sometimes the problem cannot be fixed, so students are unable to even begin the test.

Rosie continued to describe additional extrinsic barriers and shared them by stating the following:

I actually felt comfortable in the past, but let's see, how I can say this? But in this building, it has been sort of, well not sort of, it is a challenge to use technology. Well, the Smartboards because they are handy downs from other schools, they don't work. In the past, I would fix or address the problem, but now, the challenges are as such that they can only be fixed by IT, and the IT person here well, how can I say this. The IT person here is well only in school for like 2 to 3 days. He has a position that that is shared in three schools. So, he works in three schools. So, I can be teaching and turn on the Smartboard to project and if it does not work, I try to fix it, but I can't so I try to call the IT, and there are times that he is there and others he is not. Then when he is there, many times, well there are times that he cannot fix the problem. So, then I have to send an e-mail to the help desk to... Well, there are times that it takes a a-bout a week for someone in the

county, well a technician, I mean technician from the county to fix it.

Also related to extrinsic barriers, five teachers shared that there were many challenges with connectivity while utilizing Wi-Fi in the building because the connection at times was not strong enough. Leslie also identified Wi-Fi capability as a challenge in the building and explained as follows:

I would say just making sure that there is enough proper equipment to be able to do it. You know that we need to have a strong, Wi-Fi connection before using it in school. Of course, then the students should be able to connect with no issues because the system is not going down. Because at times, the Wi-Fi does not work, actually it happens often.

As far as intrinsic barriers, five teachers indicated that they lost motivation using new technology or programs when they were not efficient. For instance, Wanda identified self-efficacy as the main barrier for not utilizing some of the technology and explained as follows how it impacted her:

One of the reasons I don't use technology or certain technology is because I don't feel efficient. How can I attempt to use technology that I don't understand in front of students? I can even lose students, or they can look at me and think that I don't know what I'm doing. In reality, I hold back in using it because I don't feel comfortable.

Rosie held the same opinion and expressed the following:

How can I say this? Well, there are times that the county implements and requires us to use new programs, but the training the often give are not the best. So, we need to somehow figure it out. The problem is that I don't feel right or comfortable, I will not use it, and I don't use anything that I don't feel

comfortable using, especially when working with English-language learners because I don't want to negatively impact their learning process because their teacher can't use something well. For this reason, I just wait until I either learn how to use it or at times, I actually end up not using it.

Finally, several teachers shared that they often sought assistance from students whenever they encountered challenges because the IT personnel was not in the building on a regular basis. For instance, Wanda indicated the following:

I often seek help or ask my students for help when I have challenges because they are having so much more technology knowledge...Students are basically born with technology as they grow up with it...I mean, my first cellphone was archaic. It looked like a walky-talky...They are more reliable as our IT is not in the building full time. He should be here all day, every day, not this once or twice a week arrangement.

Similar to Wanda, Nancy shared that she also relied on students whenever technology was not working:

The students are our best resources. Whenever the LCD projector is not working, I often ask them for help. They definitely know more than I do when it comes to technology as they have been exposed to it from an early age.

#### ***Theme 5: Technology Is a Hindrance to the Academic Progress of CLD Students***

Technology can enhance the academic achievement of students (Lakhan & Laxman, 2019). However, data from this research study indicated that the implementation of technology could hinder CLD students' academic achievement. All teacher participants indicated that, for CLD students, it was best to implement some of what was considered by many educators to be old school teaching with notebook and paper and

pencil. This was exemplified by Debbie when she indicated the following:

However, when we really talk about their actual education, I firmly believe almost that the old-school approach of pen and paper, and I am not a fan of textbook, but having a physical source is the best approach...Let me put it that way, combine that with the student population which is an alternative high school, where pen and paper is I think, and I say this is the most valuable. Taking notes in a piece of paper, the writing utensil is essential. We know there are brain studies out there on how the X and the neurons and how the information enters the brain; the tactile literally holding the pencil full tactile approach...So, with a textbook, and I realize I am oversimplifying this, but there is something to literally be said to reading it, touching the paper, and to pull the information out. Could they copy a sentence directly? Yes, but I actually think they would value to copy directly...Anyway, yeah, I think it's is more effective...Yeah, yeah! I, especially with those students, I would like nothing but a notebook a pen or paper and books. And I think, I see the difference when I can give them a either a hard copy reading or literally like a textbook. The difference in having that in front of them and pulling the information out vs. Googling it. To me, is a night and day learning difference...I see it on test scores when I am able to teach in the classroom and have far more control vs. online and that's giving all online tests open notes because I can't control test security. Students do better in paper and pencil...But the in person tactile really doing it, I get much better results.

Debbie continued sharing her experiences with how activities that did not involve technology were more beneficial for CLD students' academic achievement:

An assignment that comes to mind is, well that's kind of- it is not as easy as it

sounds as there are multiple steps to it, and it is not user friendly. But I was able to model it in front of them is when I'm teaching map skills. Let's say that we are studying the changes of the European map after World War I. Well, the best way for students to realize the changes is by mapping the before and after maps with labeling the countries and coloring them.

Emily agreed that, at times, it was more beneficial to utilize paper and pencil with CLD students. She shared her sentiments in the following statement:

Using notebooks and pencil is also helpful because it's much easier to get them to show work and it's showing steps. And showing work helps me because I can then see which piece or part, they made a mistake in. I don't tell you at the end, you are wrong, start all over again. I just tell them, look over, and I highlight let's say, this part was perfect, this idea was the right idea to have here is the piece that went wrong. And that helps them understand that they are better in math than what they felt. And it helps them focus their brain on what component actually needs to be understood better... They seem more likely to write down putting in grade requirement for showing your work students show less work when they are doing something on a computer and; therefore, I can't necessarily know where they went wrong.

Similar to Debbie and Emily, Rosie also reported that technology could negatively impact CLD students' academic progress. She shared her thoughts on this topic in the following statement:

Now, as far as academic growth, well, for CLD students at times, technology negatively impacts their academic growth. I think this, for example, for my English-language learner class, students do well or better when they are reading

on paper as they have the tangible copy and can manipulate the document in an easier way, or they can go back and refer to the text after reading the questions. But, when they are reading online, they say that it is harder to find answers. When they are reading on paper, they take notes on the actual paper when they don't understand something, which is skill that we teach for reading comprehension, something that they can't do online.

Rosie also discussed how technology impacted students' critical thinking skills and creativity by stating the following:

Also, I think that technology sort of stops students' critical thinking skills. Like they use the Internet. I mean, once they know how to search to find answers quickly, instead of thinking themselves, they just Google it. It's like, technology is making them lazy. Students no longer want to think with their own brains. The same goes with creativity. Many students if I tell them create a poster with metaphors, instead of creating their metaphors like students in the past, they would just go online and find metaphors.

Leslie concurred that, at times, technology negatively impacted CLD students' academic achievement. She described her experiences as follows:

I think that it is helpful in today's world. And I think that they need courses in order to guide them on how to use technology and how to implement it, but as far as learning, like the academics, I don't think that we are crossing too soon. I think they need to be separate some time and maybe converged them in in a blend, but when students are trying to learn a subject for my purposes, biology, or chemistry or something like that, or earth science, the focus should be on learning biology or earth science, and we should be doing what comes naturally to them and the best

and easiest way for them to learn it. That's an easiest way for many students to learn that in a classroom environment or setting is not using it through technology. That's another hurdle or another challenge, just like language learners that have to go through the two: language to translate and in English, they are essentially going through different steps in the learning process. They are first learning how to navigate a technology platform, and then they are having to learn the material of biology. Is unreasonable, they should be able to learn in as simply as possible and take off the technology aspect. I can use it to teach them effectively is one thing, but if they are focusing on how to open and close Windows and how to you know, open an app, how to make, you know. I mean, I can't tell you how many students do not know or understand how to drag to make it here to make it density and how to that is so confusing, when I can really simply create in front, and I can do it simply visually and they see me and absorb it more. Why not take all that technology chunk out and throw it out the window? They can learn it later in a technology course that can be taught to them and learn the science in the science course. And we can pull them back together at a later time. That's my truth opinion. Technology has a place, but it's not the place that we are putting it.

Leslie compared the academic impact of technology for students who did not have technology backgrounds to the academic impact of technology for those who had strong technology skills. She explained the impacts by stating the following:

I think that whether technology enhances or limits to anybody has to do with how well they have been taught on how to use it. So, if students know how to use it, it like skyrocket them or at least it gives them the opportunity to skyrocket. If they

don't know how to use it, they would, there is a gap within, and they go downhill because now there is one more thing to keep trying to keep them with just to expose them to the content. So, a lot of times, I choose to avoid technology to make sure that students are not hindered by having to learn. So, in a way, yes, I think that I have been more effective with teaching students on paper first to really get them to realize that they can learn it. And often times that there are better than what they think. It's very interesting that a lot of students- adults have this perception that they are not as intelligent, but they really are and so teaching pen and paper, at least for students who are not as familiar with technology I think they acquire faster.

Emily attributed English-language learners' lack of academic success when using technology to the fact that they were learning content in a new language while learning technology, and it was overwhelming for them. She explained as follows:

I often have language learners or students with disabilities and many of them are very low-level English speakers. So, learning new technology while learning new content is particularly difficult when you don't understand the directions and how to work things...and for me I think the problem was that it was very overwhelming to learn new content and technology at the same time.

Additionally, teachers indicated that technology hindered students' academic achievement because it could be a distraction. Rosie provided details of the different distractions as follows:

Yes, technology does take away from students' attention, so it sort of, well, hinders their academic process...Sure, of course. See, now that students have these computers, they want to be on them and at times, they are not necessarily

using them for education purposes. See, let's say I tell them to create a PowerPoint presentation. Well, I am only one, and I can only see one screen at a time, and I know that there are times that some students are chatting online instead of creating the presentation or conducting research or completing the assigned task. In one school, I remember that a student was taking inappropriate pictures with this school issued iPad. So, in a way ah-ah technology can distract students.

Jen indicated that, at times, technology could enhance students' education; however, she provided additional details on how technology could obstruct CLD students' focus in academics. Most importantly, technology was impacting students' interpersonal skills, as she indicated in the following comment:

I think that, in general, having a laptop can translate...has given the students who can use it a great access to express their views, and it can enhance their education because they can now access more of their learning, but at the same time, is it too much information. I mean is like you have you have too many options like an overloaded. I can't take this anymore. You know, and some of the other disadvantages you sort of begin to sort of tune out, but it's not only for culturally and linguistically diverse students, but all students you like everything goes to their computer, and they lose like looking around for the cultural cues that you would notice if you are in the classroom. Interpersonal skills get lost, and you know, the way that we speak to each other sort of changes when we are texting and using other technological communication, access because you can't have access to translated, but at the same time you are losing some of the interpersonal stuff and you know from each other from different cultures because you are

actually interacting.

### **Conclusion**

This chapter presented the findings of this generic qualitative research study conducted at a school with a high CLD student population. The researcher began by providing a summary of the teacher participants' backgrounds. Then the researcher discussed and analyzed the five themes that surfaced from the analysis: (a) CLD students' lack of technology background, (b) CLD students' lack of technology access results in unequal access to education, (c) inadequate professional development and teacher self-efficacy, (d) extrinsic and intrinsic barriers and lack of support, and (e) technology is a hindrance to CLD students' academic progress.

## Chapter 5: Discussion

In this culminating chapter, the researcher will interpret the findings from Chapter 4. Five themes emerged from the data: (a) CLD students' lack of technology background, (b) CLD students' lack of technology access results in unequal access to education, (c) inadequate professional development and teacher self-efficacy, (d) extrinsic and intrinsic barriers limit implementation of technology instruction, and (e) technology is a hindrance to CLD students' academic progress. The researcher will discuss the meaning and understandings of the themes. Then implications and relevance of the study will be presented. In addition, the researcher will interpret and reflect on the findings, including the significance and importance to the field of education.

### Meaning and Understandings

The five themes that emerged from data collection were as follows: (a) CLD students' lack of technology background, (b) CLD students' lack of technology access results in unequal access to education, (c) inadequate professional development and teacher self-efficacy, (d) extrinsic and intrinsic barriers limit implementation of technology instruction (e) technology is a hindrance to CLD students' academic progress.

### *CLD Students' Lack of Technology Background*

As revealed in this study, CLD students encountered challenges accessing content because they lacked technology background. All eight teachers expressed concerns related to this issue as it negatively impacted their academic achievement. Teachers shared the numerous challenges they experienced when integrating technology into daily instruction and the amount of time they spent teaching students how to use the technology instead of teaching content. In addition, teachers described students and their frustrations when it comes to learning and teaching how to use technology. Most

importantly, teacher participants expressed they did not feel comfortable teaching technology because of their own limited knowledge. For instance, Wanda stated the following:

How can I help students use technology if I, myself am limited using it. I am not the right person to teach these skills. Students should have a teacher that can help them with everything related to how to use technology.

Furthermore, teacher participants pointed out that technology took away from the class when working with CLD students, especially a student with limited or no formal education (SLIFE). SLIFEs are English learners who arrived to the United States with limited or no formal education. Teachers shared that, when working with SLIFEs, they should not make assumptions about their knowledge of technology, as there are students who have never had access to one due to many factors. For example, Jen described the following, “I was stunned to find out that one of my students didn’t know how to turn on the laptop given to him. That was my mistake because I assumed he did.” This correlated with research conducted by Salva and Matis (2017), which indicated teachers cannot make assumptions related to students’ abilities, especially when working with SLIFEs.

Furthermore, according to teacher participants, this student population lacked computer literacy resulting from their limited formal education and access to technology. SLIFEs are a subgroup within English learners who arrived in the United States with limited or no formal education (DeCapua & Marshall, 2015). Consequently, when they began attending schools in the United States, they encountered additional challenges as educators frequently incorporated technology into daily instruction, and SLIFEs were often unable to use it. The challenges SLIFEs encountered were multifaceted and began with learning to attend a formal educational setting (DeCapua & Marshall, 2015). For

example, SLIFEs were learning how to follow daily school routines and expectations, such as opening lockers, bell schedules, special school events, and drills. Moreover, SLIFEs were learning a new language in a new culture as they were learning how to read and write for the first time in their lives (DeCapua & Marshall, 2015; Salva & Matis, 2017). Therefore, when teachers attempted to implement technology during instruction, students who were SLIFEs would often shut down as a result of their inability to appropriately operate the devices loaned by the county.

***CLD Students' Lack of Technology Access Results in Unequal Access to Education***

This study found that CLD students were negatively impacted by the COVID-19 pandemic, as students often did not possess the technology needed to have access to education, ultimately increasing inequities to their educational opportunities. For example, teachers in this study revealed that CLD students would often encounter challenges with their computer or Internet access, impacting their ability to attend or complete virtual classes. However, students from affluent backgrounds were able to access classes utilizing either their parents' computers or their own personal devices. In addition, despite having devices issued by the school district, many students did not have access to Wi-Fi at home. Furthermore, for those who did have access to Wi-Fi, it was not reliable as students had to share with siblings and other members of the family. The district also provided hotspots to students who did not have Wi-Fi, but these were often not working effectively, thus impacting the ability of students to access their classes. Additionally, when students encountered challenges logging into Canvas and other programs, they did not have adequate support from ICT as a result of many barriers, including knowledge of Help Desk procedures, access to the department, language, time, and transportation.

Moreover, teachers specified that access to technology varied according to the location of the school. For instance, teachers indicated that schools with more affluent families had new state-of-the-art technology. On the contrary, those who attended schools with low socioeconomic and CLD populations did not have access to new high-quality technology. All teacher participants described the technology provided to Pinecone High School as obsolete because it was previously utilized by comprehensive high schools; consequently, the technology was frequently unreliable.

This finding correlates with educational research from across the country. Inequities in education have existed for years, especially for students from low socioeconomic status and different racial backgrounds (Education Trust-West, 2020). However, the COVID-19 pandemic highlighted these inequities and widened the opportunity gap among CLD students (Education Trust-West, 2020; Sayer & Braun, 2020). Recent studies found that CLD students encountered additional challenges in education because of the lack of resources (Correia, 2020; Education Trust-West, 2020; Sayer & Braun, 2020). Educational researchers have termed this phenomenon the digital divide (Altavilla, 2020; Mupenzi et al., 2020). Because of the digital divide, economically disadvantaged students and CLD students have been negatively impacted as they do not have access to their classes. In addition, English learners, who are a subgroup within CLD students, are frequently not receiving a high-quality education as a result of the lack of access to technology, including computers and Wi-Fi (Council of the Greater City Schools, 2020; Education Trust-West, 2020). Moreover, the U.S. Department of Education (2017) revealed that English learners often attend schools that are under-resourced and are not provided with the tools needed to help these students succeed academically.

### ***Inadequate Professional Development and Teacher Self-Efficacy***

In this study, four teachers revealed that, when they did not feel comfortable utilizing technology, they did not implement it during instruction. Furthermore, all teacher participants indicated that they did not use technology because they lacked self-efficacy. Consequently, teachers stated that, in order for them to develop self-efficacy, there was a need for professional development (Moore-Hayes, 2011; Scherer et al., 2018). Teachers attributed their challenges in implementing technology into daily instruction to the lack of adequate teacher training (Johnson et al., 2016) and their self-efficacy (Korucu-Kis & Ozmen, 2019). Teachers utilized technology depending on their self-efficacy (Scherer et al., 2018; Song, 2018). If the teachers had a high level of self-efficacy and were comfortable utilizing technology, they had the capacity to integrate it effectively (Scherer et al., 2018; Song, 2018). On the contrary, if teachers were not efficient using technology, they did not implement it, and if they did, it was not effectively (Moore-Hayes, 2011; Scherer et al., 2018; Song, 2018).

Findings in this study also indicated that the lack of adequate professional development and teacher self-efficacy impacted their ability to implement technology. All teacher participants specified how the district's training was not helpful and was often disappointing. Many described the trainings as a waste of time, as trainers were not experienced teachers, training was not geared toward CLD students, and/or training covered information that was not useful. In addition, teacher participants pointed out that they often did not utilize the technology and programs provided by the district because they had not been effectively trained. Furthermore, all teachers stressed the importance of providing ongoing and effective training that they could apply during their daily instruction.

### ***Extrinsic and Intrinsic Barriers Limit Implementation of Technology Instruction***

Researchers have found that there are extrinsic and intrinsic barriers that affect the ability of teachers to implement technology into daily instruction (Lopez-Estrada et al., 2019). Extrinsic barriers were those caused by outside factors such as the infrastructure and could not be controlled by teachers (Vatanartiran & Karadeniz, 2015). These included Wi-Fi capability, devices, and ICT support. In this study, all eight teachers identified extrinsic barriers that hindered their ability to effectively implement technology into daily instruction. Wi-Fi capability was one of the extrinsic barriers that teachers in this study identified as having hindered them the most in their building.

For instance, one teacher described how, during high-stakes standardized testing, the Wi-Fi was often ineffective, causing additional stress to students. Students were often kicked out of the testing site because of the lack of Wi-Fi capability. Furthermore, teachers indicated that access to the instructional technology coordinator was a challenge because the person held a part-time position and was in the building only 1.5 days a week. Teacher participants described their frustrations because they often needed assistance from the instructional technology coordinator, but the individual was not present in the building. For this reason, many teachers decided not to utilize the available technology.

Intrinsic barriers are the ones within the individual, and this includes teachers' attitudes (Lopez-Estrada et al., 2019). If teachers are confident and motivated about utilizing the technology, they are more likely to implement it successfully (Reyneke, 2020; Uluyol & Sahin, 2016). On the other hand, if teachers are not confident and are unmotivated, they are less likely to effectively implement technology (Reyneke, 2020; Uluyol & Sahin, 2016). In this research study, teachers indicated that they often did not

use the technology provided by the county. For instance, four teachers admitted to not using Canvas when it was first rolled out because they did not receive training and did not know how to use it. It was not until the pandemic that they began to utilize it because it was the only platform they could use. Additionally, seven teachers stated that they did not use any of the programs provided by the county if they had not received comprehensive training.

### ***Technology Is a Hindrance to CLD Students' Academic Progress***

Findings in this study indicated that technology was a hindrance to CLD students' academic progress. For instance, teachers stated that students did poorly academically if they used technology. This could be attributed to the fact that many CLD students were trying to learn content in a new language as they were trying to also learn how to use technology. Furthermore, six teachers pointed out that CLD students, especially English learners, often did poorly academically when teachers utilized technology. This simultaneous learning caused students to feel overwhelmed as they were trying to learn in three different contexts: language, content, and technology. Consequently, they recommended that teachers utilize the old school paper, pencil, books, and other hands-on activities.

This finding correlated with studies indicating that the integration of technology had a negative impact on CLD students' academic achievement (Carhill-Poza et al., 2020). Carhill-Poza (2017) stated that using technology with a vulnerable student population is an equity issue. According to Carhill-Poza, there was evidence of a significant achievement gap between English learners and general education students because the academic demands and ineffective use of technology are inadequate. Furthermore, English learners, who are a subgroup within CLD students, represent a

diverse group of students. There are some English learners who arrive in the United States with formal education and can use technology successfully, hence improving their academic achievement (Carhill-Poza et al., 2020). On the other hand, there is another group of English learners, known as SLIFEs, who arrive with no formal education; therefore, when SLIFEs enter school systems, they experience difficulties learning using technology as they do not have basic technological skills (Carhill-Poza et al., 2020).

### **Implications of the Study**

The findings of this study will assist the school district in making the necessary changes to enhance the integration of technology when working with CLD students. In addition, the findings will serve as a guide to teachers when implementing best practices for integrating technology when teaching CLD students. When analyzing findings, it is evident that teachers are encountering numerous challenges when integrating technology into daily instruction when working with CLD students. For example, there were CLD students who lacked technology background; consequently, when teachers attempted to integrate technology, they spent their time teaching the students how to use it instead of implementing it as a strategy for teaching content. Despite teachers stating that technology hinders CLD students' academic achievement, as it causes challenges when teaching content, teachers indicated that it is essential for CLD students to learn these skills.

### ***Importance of Integrating Technology Into Daily Instruction***

Teachers of CLD students must incorporate technology into daily instructions to prepare students for the jobs of the future (Plough, 2017). Teacher participants in this study also believed that it is essential for CLD students to develop technology skills so they can compete in the workforce. For instance, Rosie stated, "It is so important for us to

teach CLD students how to use computers because if for some reason they don't attend college, they can at least have basic skills that they can use in different occupations.” Plough (2017) and Tarbuton (2018) agreed, as they indicated that students need to have knowledge of technology to be able to enter professions and be competitive in the workforce. Furthermore, being computer literate is essential for the jobs of the future; consequently, students must learn how to use technology starting their early education (Marx, 2014).

As previously mentioned in the findings, technology can take away from a teacher's time to teach content, causing students to fall behind in the curriculum of the subject matter. Consequently, it is imperative for teachers to find a balance of when to adequately implement technology during instruction. For instance, Leslie stated the following:

Yes, students need to know how to use the computer, but I know that when I try to use technology, I spent more time teaching students how to use it that by the time we are ready, it's time to go, and there goes the lesson.

For this reason, teachers need to also select programs and materials that are adequate for students' language and technological skills.

### ***Lack of Culturally Sensitive Technological Programs and Materials***

In addition to CLD students not having technological skills, another challenge that teachers encountered when integrating technology was finding culturally sensitive technological programs and materials. For example, Rosie stressed how important it was to utilize materials and programs that were culturally appropriate. However, it was challenging for her to find culturally sensitive curricular materials that represented her students' cultures. Rosie described this challenge in the following statement:

So, many of the books and materials out there, are not, unfortunately do not represent my students. Yes, it has gotten a bit, slightly better, but there's still a need for educational materials that represent multicultural students and students from various socio-economic backgrounds. I would like to see materials with Blacks, Latinx, Indians, Chinese, you know, everyone... There are even times that when I'm looking for pictures for my presentations and most pictures are of Whites, and it is hard to find pictures representing different ethnic backgrounds. Also, some of the books in the curriculum are completely outdated and students, not even teenage Caucasians can relate to those stories like Huckleberry Fin and other stories like that one. Students are not interested in those.

It is challenging to find culturally sensitive, nonstereotypical educational materials. Research findings from a study conducted by Moraová (2017) found that online mathematical materials were predominately of White middle class families whose families were a nuclear one, and materials did not include minority families of families whose parents are divorced. The lack of culturally sensitive materials adds to the challenges teachers encounter when integrating technology as CLD students cannot connect to the materials that are being used.

To address this challenge, the school district should revise curricula to make content more equitable by representing a variety of multicultural perspectives. This includes creating a curriculum that is responsive to all students' needs and cultural backgrounds. In addition, teachers need to have knowledge and understanding of their students' backgrounds. Therefore, it is imperative for teachers to forge relationships with students and families. Teachers can utilize the information they learn about their students when planning for instruction and its delivery. Furthermore, teachers must select

literature and materials representing students' cultures in order for them to relate to them.

***Teachers Cannot Assume That Students Know How to Use Technology***

Teacher participants emphasized the importance for educators not to make assumptions related to students' ability to use technology. Teachers described a subgroup within CLD students who are identified as SLIFEs. According to teacher participants, this student population did not possess any computer literacy as they came from countries where education was limited or they had not attended school. DeCapua and Marshall (2015) identified a subgroup of SLIFEs who might have attended school; however, the school systems they attended might not have had the same types of technology and resources as schools in the United States.

Consequently, when SLIFEs entered classes in the United States, they encountered additional challenges, as educators were frequently utilizing technology into daily instruction, and SLIFEs were often unable to use it. SLIFEs are a group of students who did not have the opportunity to receive formal education, and most are from economically disadvantaged communities (DeCapua & Marshall, 2015); therefore, they did not have access to technology. This finding correlates with findings from research conducted by Salva and Matis (2017), which indicated that teachers cannot make assumptions about what students can or cannot do, especially when working with SLIFEs. Consequently, teachers must be vigilant and ensure that students know how to operate the devices. To address this issue, teacher participants indicated that it would be beneficial to assess students' technology skills when they enter schools. The assessment should include whether students have knowledge of key terminology and basic computer skills, including how to send e-mails, include attachments, and use the mouse, among other essential skills.

### ***Teachers Need Training to Help Them Develop More Simplistic Canvas Pages***

Teachers specified that, when working with CLD students, they needed to be simplistic and consistent to minimize challenges when utilizing Canvas. For example, Rosie stated the following:

If the Canvas page is too complicated and has many links or it is not design with a clear, simple to follow template, it will be a mess for students, and then they will not complete work because it is too much for them to follow.

Similar to Rosie, Wanda described the following:

First, I didn't know how to use Canvas, and to make matters worse, I needed to design a page. So, I began to design one, that I thought it was great looking and appealing to students, but then, students couldn't find anything on the page. So, we need help on how to adapt or design simple Canvas pages.

Therefore, it can be determined that Canvas pages, which contains designs that are complicated, have a negative impact on students' academic achievement. According to teacher participants, students were often confused because they could not navigate the pages, including how to access lessons, turn in assignments, and how to attach documents. Because of this, teacher participants agreed on utilizing the same simple template so students can have consistency, which ultimately assisted them in navigating all teachers' Canvas pages. However, students who had the two teachers who did not utilized this template were struggling because they could not follow and complete modules and assignments. This finding correlates with research conducted by Mupenzi et al. (2020), who found that CLD students in Australia encountered challenges with virtual learning because they did not possess the skills to navigate through technology.

Consequently, researchers suggested keeping educational platforms simple for the benefit of CLD students (Mupenzi et al., 2020). To address this issue, teacher participants emphasized that teacher training must be focused on how to design Canvas pages in a way that it is not challenging for CLD students.

### **Recommendations for Change and Future Research**

The findings in this study indicated that there are equity challenges in providing high-quality educational opportunities to CLD students. It is evident that there is a digital divide among affluent White students and CLD students because affluent families are able to provide the technology needed to have access to education, especially during the pandemic. Furthermore, the lack of access to technology and the ability to use it are also factors that contribute to the achievement gap. Consequently, the researcher has some recommendations for school districts to follow.

#### ***Recommendations for Change***

The researcher has five recommendations to make after analyzing the data. These recommendations will enhance educators' ability when integrating technology when working with CLD students. First, the researcher recommends that the district address the access inequities issues that continued to be present. One way to address this challenge is for the district to form partnerships with businesses that provide Internet, such as Comcast, Verizon, and Sprint, so they can provide free Internet access to students from low socioeconomic backgrounds. However, it is crucial for the district to obtain the information needed from the families in a timely manner so the students can access their courses immediately without any complications. In addition, prior to the first day of school, schools should hold a tech fair that requires students to take their device to the ICT department to ensure it is fully functioning, including the hardware, usernames,

passwords, and access to all applications. These protocols can decrease the inequities in technology access.

The second recommendation is for school districts to allocate appropriate resources. For example, schools with an affluent student population receive better technology. However, schools with a high CLD student population are given the equipment that comprehensive schools are no longer using. Consequently, teacher participants encountered challenges implementing technology because it was often outdated. Therefore, the school district must allocate resources equitably. Most importantly, if school districts allocate funding adequately, this will assist in minimizing the digital divide and other inequities in education.

Third, the researcher recommends improving teacher training on technology for those teachers who instruct CLD students. Teachers are continuously attending mandatory professional development on how to use technology platforms to facilitate instruction; however, the presenters do not always have specialized experience using the technology or platforms in an actual classroom or in a classroom with a high CLD student population. It is recommended that the district selects highly qualified presenters with teaching experience. The district does not need to have individuals presenting products they are adopting, but it does need to have people with experience teaching CLD students who can also answer questions regarding any issues that arise when integrating technology into a classroom. In addition, it is recommended for the district to conduct research on the products they are thinking of purchasing. When evaluating the product, there should be a group of highly qualified teachers who are currently working with the different types of student populations. This way, teachers can provide feedback about whether the district should purchase the product. This will alleviate the challenges

that teachers and students encounter when introduced to a program that is not adequate for their learning needs. When the district provides adequate technology training to teachers, teachers will be able to focus solely on instructing while using an educational application to enhance student learning.

Fourth, the school should adopt a simple template for Canvas subject-matter pages that is required for use by all teachers. Most importantly, school administrators must enforce that teachers are utilizing the adopted template. In designing the template, it is imperative to create a simple one that does not require students to follow too many instructions, links, programs, or websites. Adopting a template will be beneficial to CLD students because it will provide consistency, ultimately facilitating students' academic achievement, as participants in this study indicated that CLD students often were frustrated and unmotivated if the Canvas pages were too elaborate. At the beginning of the pandemic, each teacher created Canvas pages utilizing a different layout. Consequently, CLD students were often confused because they were not able to find assignments, links, and other vital information.

The last recommendation the researcher has for the district is to create and offer a foundational technological class where students are trained on basic technology skills that will build confidence in their ability to use a technology device loaned by the school for learning every subject matter. Students currently rely on teachers to help them navigate technology in addition to learning content simultaneously. Unfortunately, teachers are not always tech savvy, and, at times, the knowledge they have is not enough to help a student with a device. The school district should offer a foundational technological class that covers technical terminology often used in classrooms, how to use the technology device loaned by the school, how to access Internet, what not to access on the Internet, how to

upload and download school-related files or applications, and more. Teachers should assess all students' technological skills either at the beginning of the school year or upon the students' entry. Then, results should be analyzed to identify students who need this foundational technological class.

### ***Recommendations for Future Research***

The researcher has two recommendations for future studies. First, teachers in this study indicated that technology hinders CLD students' academic achievement and that students perform better when they are given hands-on activities. Therefore, the researcher recommends conducting a study to compare CLD students' achievement when teachers utilize technology during instruction versus when they use hands-on activities and manipulatives. To accomplish this, the researcher recommends conducting a case study to collect data from various forms, including classroom observations, teacher interviews, and student scores from assessments. Teachers will introduce a concept or skill utilizing technology as the researcher takes notes from the classroom observations. Then students will be given an assessment to gather data of their understanding of the concept. Furthermore, a different concept will be introduced utilizing hands-on activities and manipulatives as the researcher takes notes on the classroom observations. Students will be assessed after this activity as well. In addition, the researcher will utilize an interview protocol to gather data related to teachers' experiences with CLD students' achievement when they use technology versus hands on activities and manipulatives. The data collected from the observations, teacher interviews, and assessments will be used to compare CLD students' achievement when concepts were presented utilizing technology versus hands-on activities and manipulatives.

Second, the researcher suggests a 4-year longitudinal study of academic

achievement to determine the effect implementation of technology has on CLD students. For this type of study, the researcher suggests periodical classroom observations to observe how students' academic achievement is being impacted when teachers are utilizing technology. Furthermore, the researcher suggests conducting periodic indepth interviews with teachers to examine their perceptions of how technology is impacting their students' academic achievement. In addition, data from students' academic achievement should be analyzed to obtain information of how the implementation of technology in the classroom has impacted students' academic achievement.

### **Conclusion**

As the numbers of CLD students continue to increase in schools across the United States, school districts need to explore means of how to improve the adequate integration of technology when working with CLD students to ultimately close the achievement gap. Consequently, school districts need to first provide comprehensive and ongoing professional development which also includes how to implement programs that are culturally sensitive. To accomplish this, school districts must hire professionals who have been teachers and have experienced success implementing technology to adequately train teachers. Consequently, schools must create a course for students who lack foundational technological skills that focuses on developing these skills as well as the terminology used in this field.

Although this effort would require additional funding, as well as highly qualified and experienced teachers, it would instill confidence in all CLD students who are using technology for the first time in their lives. Correspondingly, due to the COVID-19 pandemic, many school districts are continuing to provide a virtual option for their schools. However, many CLD students lacked access to Internet connection and technical

support. For this reason, it is imperative for school districts to ensure students have access to all the tools they need, including Internet connection, a personal device, and access to technical support. It is important for school districts to continue to invest and plan with all students in mind, including CLD students.

## References

- Abadiano, H. R., & Turner, J. (2007). New literacies, new challenges. *New England Reading Association Journal*, 43(1), 75-79.
- Abdoulai-Haji, S., Eloheneke-Moluayonge, G., & Park, I. (2017). Teachers' use of information and communications technology in education: Cameroon secondary schools' perspectives. *Turkish Online Journal of Educational Technology*, 16(3), 147-153.
- Adedodkun-Shittu, N. A., & Shittu, A. J. K. (2014). Evaluating the impact of technology integration in teaching and learning. *Malaysian Online Journal of Educational Technology*, 2(1), 23-29.
- Ahmed-Alismail, H. (2015). Integrate digital storytelling in education. *Journal of Education and Practice*, 6(9), 126-129.
- Akcayir, M. (2011). *The effect of mathematics course using smart board on the success, attitude and motivation of first-grade students in classroom teacher* [Unpublished master's thesis]. Gazi University.
- Akyol, B. (2016). Teacher self-efficacy perceptions, learning oriented motivation, lifelong learning tendencies of candidate teachers: A modeling study. *Eurasian Journal of Educational Research*, 65(1), 19-34.
- Alenezi, A. (2017). Obstacles for teachers to integrate technology with instruction. *Education and Information Technologies*, 22(4), 1797-1816. <https://doi.org/10.1007/s10639-016-9518-5>
- Al-Kindi, S. S., & Al-Suqri, M. N. (2017). Mobilizing learning: Using Moodle and online tools via smartphones. *International Journal of Knowledge Content Development & Technology*, 7(3), 67-86.

- Almeroth, K., & Zhang, H. (2013). Alternatives for monitoring and limiting network access to students in network-connected classrooms. *Journal of Interactive Research, 24*(4), 237-265.
- Altavilla, J. (2020). How technology affects instruction for English learners. *Phi Delta Kappan, 102*(1), 18-23.
- Alvarado, L. E., Aragón, R. R., & Bretones, F. D. (2020). Teachers' attitudes towards the introduction of ICT in Ecuadorian public schools. *TechTrends, 64*(5), 498-505. <https://doi.org/10.1007/s11528-020-00483-7>
- American Association for Colleges of Teacher Education. (2002). *Educators' preparation for cultural and linguistic diversity: A call to action*. AACTE Committee on Multicultural Education.
- Anstiss, P. A., Meijen, C., & Marcora, S. M. (2018). The sources of self-efficacy in experienced and competitive endurance athletes. *International Journal of Sport and Exercise Psychology*. Advance online publication. <https://doi.org/10.1080/1612197X.2018.1549584>
- Ashton, P. T., & Webb, R. B. (1986). *Making a difference: Teachers' sense of efficacy and student achievement*. Longman.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Prentice-Hall.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. Freeman.
- Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology, 2*(1), 1-26.
- Bandura, A., & Adams, N. E. (1977). Analysis of self-efficacy theory of behavioral change. *Cognitive Therapy and Research, 1*(4), 287-310.

- Bandura, A., Adams, N. E., Hardy, A. B., & Howells, G. N. (1980). Tests of the generality of self-efficacy theory. *Cognitive Therapy and Research*, 4(1), 39-66.
- Bardack, S. (2010). *Common ELL terms and definitions*. American Institutes for Research. <http://www.air.org/resource/common-ell-terms-and-definitions>
- Bellan, R. (2019, March 27). \$23 billion education funding report reveals less money for city kids. *Bloomberg City Lab*. <https://www.bloomberg.com/news/articles/2019-03-27/why-city-kids-get-less-money-for-their-education>
- Berg, M. A., & Huang, J. (2015). Improving in-service teachers' effectiveness: K-12 academic literacy for the linguistically diverse. *Functional Linguistics*, 2(5), 1-21. <https://doi.org/10.1186/s40554-015-0017-6>
- Bingimlas, K. A. (2009). Barriers to the successful integration of ICT in teaching and learning environments: a review of the literature. *Eurasian Journal of Mathematics, Science and Technology Education*, 5(3), 235-245.
- Blackwell, C. K., Lauricella, A. R., Wartella, E., Robb, M., & Schomburg, R. (2013). Adoption and use of technology in early education: The interplay of extrinsic barriers and teacher attitudes. *Computers & Education*, 69(2013), 310-319.
- Bledow, R. (2013). Demand-perception and self-motivation as opponent processes: A response to bandura and Vancouver. *Journal of Management*, 39(1), 14-26.
- Blundell, C., Lee, K., & Nykvist, S. (2020). Moving beyond enhancing pedagogies with digital technologies: Frames of reference, habits of mind and transformative learning. *Journal of Research on Technology in Education*. 52(2), 178-196. <https://doi.org/10.1080/15391523.2020.1726235>
- Board of Education Commonwealth of Virginia. (2020). *Computer technology standards*. [https://www.doe.virginia.gov/testing/sol/standards\\_docs/computer\\_technology/in](https://www.doe.virginia.gov/testing/sol/standards_docs/computer_technology/in)

dex.shtml

- Bobo, S. D. (2016). *Examining the changing relationship between literacy and technology in an international school* (Publication No. 10195569) [Doctoral dissertation, University of Pennsylvania]. ProQuest Dissertations and Theses Global.
- Bottoms, S. I., Ciechanowsky, K. M., & Harman, B. (2015). Learning to teach elementary science through iterative cycles of enactment in culturally and linguistically diverse contexts. *Science Teacher Education, 26*(7), 715-742. <https://doi.org/10.1007/s10972-016-9447-7>
- Brown, M. R. (2013). Identifying and integrating relevant educational/instructional technology (E/IT) for culturally and linguistically diverse (CLD) students with disabilities in urban environments. *Journal of the American Academy of Special Education Professionals, 22*(1), 6-19.
- Burggraaf, R. (2020). *Digital learning environment development: action research using a situated coaching model with elementary classroom teachers* (Publication No. 27743714) [Doctoral dissertation, University of South Carolina]. ProQuest Dissertations and Theses Global.
- Calabrese, R. (2015). A collaboration of school administrators and a university faculty to advance school administrator practices using appreciative inquiry. *International Educational Management, 29*(2), 213-221.
- Calabrese, R., & Miller, D. (2013, May 20-21). *Identifying school administrators' strength using appreciative inquiry* [Paper presentation]. American Educational Research Association annual meeting, San Francisco, CA, United States.
- Carhill-Poza, A. (2017). Re-examining English language teaching and learning for

- adolescents through technology. *System*, 67(1), 111-120.
- Carhill-Poza, A., Williams, T., & Chen, J. (2020). *Teaching and learning with technology in linguistically diverse classrooms*. Nellie Mae Education Foundation. <https://www.nmefoundation.org/resources/teaching-and-learning-with-technology-in-linguistically-diverse-classrooms/>
- Chandra, S., & Leong, F. T. L. (2016). A diversified portfolio model of adaptability. *American Psychologist*, 71(9), 847-862.
- Charity-Hudley, A. H., & Mallinson, C. (2017). "It's worth our time": A model of culturally and linguistically supportive professional development for K-12 STEM educators. *Cultural Studies of Science Education*, 12(6), 637-660. <https://doi.org/10.1007/s11422-016-94743-7>
- Christensen, C. (2008). *Disrupting class: How disruptive innovation will change the way the world learns*. McGraw-Hill.
- Clossen, A. (2018). Integrating the library in the learning management system. *Library Technology Reports*, 54(5), 5-6.
- Connor, C., & Beard, L. A. (2015). Increasing meaningful assistive technology use in the classroom. *Universal Journal of Educational Research*, 3(9), 640-642. <https://doi.org/10.13189/ujer.2015.030908>
- Conway, P., & Zhao, Y. (2003). From luddites to designers: Portraits of teachers and technology in political documents. In Y. Zhao (Ed.). *What should teachers know about technology: Perspectives and practices* (pp. 14-30)? Information Age.
- Correia, A. P. (2020). Healing the digital divide during the covid-19 pandemic. *Quarterly Review of Distance Education*, 21(1), 13-22.
- Council of the Greater City Schools. (2020). *Supporting English learners in the COVID-*

*19 crisis*. [https://www.cgcs.org/cms/lib/DC00001581/Centricity/domain/35/publication\\_docs/CGCS\\_ELL\\_and\\_COVID\\_web\\_v2.pdf](https://www.cgcs.org/cms/lib/DC00001581/Centricity/domain/35/publication_docs/CGCS_ELL_and_COVID_web_v2.pdf)

Cousins, B., & Walker, C. (2000). Predictors of educators' valuing of systematic inquiry in schools. *Canadian Journal of Program Evaluation*, 22(1), 25-52.

Crawford, R. (2014). The evolution of technology: Landmarking Australian secondary school music. *Australian Journal of Music Education*, 4(2), 77-92.

Creswell, J. W. (2013). *Qualitative inquiry and research design: Choosing among five approaches* (3rd ed.). Sage.

Creswell, J. W. (2015). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (5th ed.). Pearson.

Creswell, J. W. (2016). *30 essential skills for the qualitative researcher*. Sage.

Davidson, L. Y. J., Richardson, M., & Jones, D. (2014). Teachers' perspective on using technology as an instructional tool. *Research in Higher Education Journal*, 24(1), 25-26.

DeCapua, A., & Marshall, H. W. (2015). Reframing conversation about students with limited or interrupted formal education: From achievement gap to cultural dissonance. *NASSP Bulletin*, 99(4), 356-370. <https://doi.org/10.1177/01926365.1562.0662>

Delgado, A. J., Wardlow, L. M., McKnight, K., & O'Malley, K. (2015). Educational technology: A review of the integration, resources, and effectiveness of technology in K-12 classrooms. *Journal of Information Technology Education: Research*, 14(4), 397-416.

Douglas-Horsford, S., & Sampson, C. (2013). High-ELL-growth states: Expanding funding equity and opportunity to English language learners. *Voices in Urban*

*Education*, 37(1), 47-49.

- Dunn, K. E., & Rakes, G. C. (2010). Learner-centeredness and teacher efficacy: Predicting teachers' consequence concerns regarding the use of technology in the classroom. *Journal of Technology and Teacher Education*, 18(1), 57-81.
- Dussault, M., Deaudelin, C., & Brodeur, M. (2004). Teachers' instructional efficacy and teachers' efficacy toward integration of information technologies in the classroom. *Psychological Reports*, 94(10), 1375-1381.
- Eddy, C. L., Herman, K. C., & Reinke, W. M. (2019). Single-item teacher stress and coping measures: Concurrent and predictive validity and sensitivity to change. *Journal of School Psychology*, 76(1), 17-32.
- Education Trust-West. (2020). *A vision for California's schools this fall: Equity for dual language and English learners in an unprecedented moment*. <https://west.edtrust.org/wp-content/uploads/2017/11/A-Vision-for-Californias-Schools-this-Fall.pdf>
- Efe, H. A., Efe, R., & Yücel, M. (2016). A comparison of Swiss and Turkish pre-service science teachers' attitudes, anxiety and self-efficacy regarding educational technology. *Universal Journal of Educational Research*, 4(7), 1583-1594.
- Erlich, S. B., Spote, S. E., & Sebring, P. E. (2013). The use of technology in Chicago Public Schools 2011: Perspectives from students, teachers, and principals. *Consortium on Chicago School Research*, 23(1), 1-48.
- Ertmer, P. A. (2005). Teacher pedagogical beliefs: The final frontier in our quest for technology integration? *Educational Technology Research and Development*, 53(4), 25-39.
- Ertmer, P. A., Ottenbreit-Leftwich, A. T., Sadik, O., Sendurur, E., & Sendurur, P. (2012). Teacher beliefs and technology integration practices: A critical relationship.

*Computers and Education*, 59(2), 423-435. <https://doi.org/10.1016/j.compedu.2012.02.001>

- Ertmer, P. A., Ottenbreit-Leftwich, A. T., & Tondeur, J. (2016). Teacher beliefs and uses of technology to support 21st-century teaching and learning. In H. R. Fives & M. Gill (Eds.), *International handbook of research on teacher beliefs* (pp. 403-418). Taylor & Francis.
- Feltz, D. L., Short, S. E., & Sullivan, P. J. (2008). *Self-efficacy in sport: Research and strategies for working with athletes, teams, and coaches*. Human Kinetics.
- Fernández-Cruz, F. J., & Fernández-Díaz, M. J. (2016). Generation Z's teachers and their digital skills]. *Revista Comunicar*, 24(46), 97-105. <https://doi.org/10.3916/C46-2016-10>
- Flowers, J., & Hunt, B. (2012). Historiography in graduate technology teacher education. *Journal of Technology Students*, 38(1), 2-11.
- Fluck, A., & Dowden, T. (2011). On the cusp of change: Examining pre-service teachers' beliefs about ICT and envisioning the digital classroom of the future. *Journal of Computer-Assisted Learning*, 29(1), 1-10.
- Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2012). *How to design and evaluate research in education* (8th ed.). McGraw-Hill.
- Frey, W. (2015). *Diversity explosion: How racial demographics are remaking America*. Brookings Institution Press.
- Gay, G. (2013). Teaching to and through cultural diversity. *Curriculum Inquiry*, 43(1), 48-70.
- Ghavifekr, S., Kunjappan, T., Ramasamy, L., & Anthony, A. (2016). Teaching and learning with ICT tools: Issues and challenges from teachers' perceptions.

*Malaysian Online Journal of Educational Technology*, 4(2), 38-57.

- Gonzales, L., & Belleau, G. (2017). Tech integration: What's new for schools? *Leadership*, 24(1), 24-26.
- Gonzalez, M. M. (2016). Preparing teacher candidates for the instruction of English language learners. *Networks*, 18(2), 213-217.
- González-Sanmamed, M., Sangrà, A., & Muñoz-Carril, P. C. (2017). We can, we know how. But do we want to? Teaching attitudes towards ICT based on the level of technology integration in schools. *Technology, Pedagogy and Education*, 26(5), 633-647. <https://doi.org/10.1080/1475939X.2017.1313775>
- Grundmeyer, T. (2013). Adopting technology: Using student qualitative data and Gartner's hype cycle. *Journal of Education and Training Studies*, 2(1), 61-78.
- Haddad, W. D. (2003). *Is instructional technology a must for learning?* [http://www.techknowlogia.org/TKL\\_Articles/PDF/455.pdf](http://www.techknowlogia.org/TKL_Articles/PDF/455.pdf)
- Haji, S. A., Moluayonge, G. E., & Park, I. (2017). Teachers' use of information and communications technology in education: Cameroon secondary schools' perspectives. *Turkish Online Journal of Educational Technology*, 16(3), 147-153.
- Hallström, J., & Gyberg, P. (2011). Technology in the rear-view mirror: How to better incorporate the history of technology into technology education. *International Journal of Technology and Design Education*, 21(1), 3-17. <https://doi.org/10.1007/s10798-009-9109-5>
- He, Y., Vetter, A., & Fairbanks, C. (2014). Reframing literacy practices for culturally and linguistically diverse students in U.S. schools. *English Education*, 46(4), 327-344.
- Hendrix, E. (2005). Permanent injustice: Rawls' theory of justice and the digital divide. *Journal of Educational Technology & Society*, 8(1), 63-68.

- Hew, K. F., & Brush, T. (2007). Integrating technology into K-12 teaching and learning: Current knowledge gaps and recommendations for future research. *Educational Technology Research and Development*, 55(3), 223-252.
- Hicham, Z. (2016). Integrating computers in the classroom: Barriers and teachers' attitudes. *International Journal of Instruction*, 9(1), 65-78.
- Hoye, S. R. (2017). *Teachers' perceptions of the use of technology in the classroom and the effect of technology on student achievement* (Publication No. 10616975) [Doctoral dissertation, Mississippi College]. ProQuest Dissertations and Theses Global.
- Hsu, P. (2016). Examining current beliefs, practices and barriers about technology integration: A case study. *Tech Trends*, 60(1), 30-40.
- Inan, F. A., & Lowther, D. L. (2010). Factors affecting technology integration in K-12 classrooms: A path model. *Educational Technology Research and Development*, 58(2), 137-154.
- Islim, O. F., & Sevim-Cirak, N. (2017). Technology and college students: What faculty members think about the use of technology in higher education. *Malaysian Online Journal of Educational Technology*, 5(2), 34-50.
- Javeri, M., & Chen, P. (2006). Preparing urban teachers to integrate technology for instruction: Challenges and strategies. *Journal of Urban Learning, Teaching, and Research*, 44(2), 151-167.
- Jensen, L. A. (2010). Extend instruction outside the classroom: Take advantage of your learning management. *Computers in Libraries*, 30(6), 766-78.
- Joët, G., Usher, E. L., & Bressoux, P. (2011). Sources of self-efficacy: an investigation of elementary school students in France. *Journal of Educational Psychology*, 103(3),

649-663.

- Johnson, A. M., Jacovina, M. E., Russell, D. E., & Soto, C. M. (2016). *Challenges and solutions when using technologies in the classroom*. In S. A. Crossley & D. S. McNamara (Eds.), *Adaptive educational technologies for literacy instruction* (pp. 13-29). Taylor & Francis.
- Juggernath, A., & Govender, N. (2020). Natural sciences teachers' beliefs as barriers for integrating ICTs in a technology-rich context. *African Journal of Research in Mathematics, Science and Technology Education*, 24(1), 105-115.
- Karsenti, T., Villeneuve, S., & Goyer, S. (2006). The impact of motivation on a prospective teachers' use of information and communication technologies (ICTs). In C. Crawford (Ed.), *Proceedings of the Society for Information Technology and Teacher Education International Conference 2006* (pp. 1659-1666). Association for the Advancement of Computing in Education.
- Kay, R. H. (2006). Evaluating strategies used to incorporate technology into pre-service education: A review of the literature. *Journal of Research on Technology in Education and Information Technologies*, 38(4), 383-408.
- Khlaif, Z., Gok, F., & Bochra, K. (2019). How teachers in middle schools design technology integrating activities. *Teaching and Teacher Education*, 78(2), 141-150.
- Kim, Y., Chung, S., & So, J. (2019). Success expectancy: A mediator of the effects of source similarity and self-efficacy on health behavior intention. *Health Communication*, 35(9), 1063-1072. <https://doi.org/10.1080/10410236.2019.1613475>
- Kirschner, A. P. (2015). Do we need teachers as designers of technology enhanced

- learning? *Instructional Science*, 43(1), 39-322.
- Korucu-Kis, S., & Ozmen, K. S. (2019). Exherent and inherent value beliefs about technology: Missing pieces in the puzzle of technology integration? *International Journal of Educational Technology*, 6(1), 1-11.
- Kotrlik, J. W., & Redmann, D. H. (2005). Extent of technology integration in instruction by adult basic education teachers. *Adult Education Quarterly*, 55(3), 200-219.  
<https://doi.org/10.1177/0741713605274630>
- Kurbanolu, S. (2004). Self-efficacy belief and its importance for information professionals. *Bilgi Dunyasi*, 5(2), 137-152.
- Kuyatt, A., Holland, G., & Jones, D. (2015). An analysis of teacher effectiveness related to technology implementation in Texas secondary schools. *Contemporary Issues in Education Research*, 8(1), 63-70.
- Kvale, S. (2008). *Doing interviews*. Sage.
- Lai, C. C. (2006). The advantages and disadvantages of computer technology in second language acquisition. *National Journal for Publishing and Mentoring Doctoral Student Research*, 3(1), 1-6.
- Lakhan, A., & Laxman, K. (2019). Comprehensive review on academic achievement levels through m-learning. *I-Manager's Journal on Educational Psychology*, 13(2), 49-58.
- Leithner, A. (2009). Review of blended learning: Using technology in and beyond the language classroom. *Language Learning & Technology*, 13(1), 33-39.
- Leithwood, K. (1994). Leadership for school restructuring. *Educational Administration Quarterly*, 30(4), 498-518.
- Leithwood, K., Jantzi, D., & Steinbach, R. (1999). *Changing leadership for changing*

*times*. Open University Press.

- Lightfoot, J. M. (2005). Integrating emerging technologies into traditional classrooms: A pedagogic approach. *International Journal of Instructional Media*, 32(3), 209-224.
- Liu, P. (2016). Chinese teachers' perspectives on teachers' commitment to change. *International Journal of Comparative Education and Development II*, 18(1), 2-18.
- Lohfink, G., Morales, A., Shroyer, G., Yahnke, S., & Hernandez, C. (2011). A distance-delivered teacher education program for rural culturally and linguistically diverse teacher candidates. *Rural Educator*, 33(1), 25-36.
- Lopez-Estrada, P., Rodriguez, P., & Bonet, M. (2019). Exploring perspectives, negotiating computer-mediated landscapes, and integrating technology in linguistically and culturally-diverse learning spaces. *Educare Electronic Journal*, 23(2), 1-18. <https://doi.org/10.15359/ree.23-2.20>
- Machado-Casas, M., Alanis, I., & Ruiz, E. (2017). Innovative technologies as social pedagogy: Transforming informal educational practices in the United States. *Pedagogia Social*, 29(4), 51-62. [https://doi.org/10.5E7179/PSRI\\_2017.29.04](https://doi.org/10.5E7179/PSRI_2017.29.04)
- Maddux, J. E. (2016). Self-efficacy. In S. Trusz & P. Babel (Eds.), *Interpersonal and intrapersonal expectancies* (pp. 57-78). Taylor & Francis.
- Marx, G. (2014). *Twenty-one trends for the 21st century: Out of the trenches and into the future*. Education Week Press.
- Masih, A., & Vidyapati, T. (2018). Effective use of ICT in teacher education for inclusive environment in classroom. *Educational Guest*, 9(3), 247-251.
- Mason, C. Y., & Dodd, R. (2005). Bridge the digital divide for educational equity. *Education Digest*, 70(9), 25-27.

- McLean, S., Frazier, V., & Vo, T. (2020). *Barriers to digital equity: a case study of king county* (Publication No. 28026326) [Doctoral dissertation, Seattle University]. ProQuest Dissertations and Theses Global.
- Menken, K., & Antunez, B. (2001). *An overview of the preparation and certification of teachers working with limited English proficient students*. National Clearinghouse for English Language Acquisition.
- Montiel-Overall, P. (2010). The effect of service learning on LIS students' understanding of diversity issues related to equity of access. *Journal of Education for Library and Information Science*, 51(4), 251-266.
- Moore-Hayes, C. (2011). Technology integration preparedness and its influence on teacher-efficacy. *Canadian Journal of Learning and Technology*, 37(3), 15-16.
- Moraová, H. (2017). Do authors of online electronic materials for teaching mathematics use their potential to use non-stereotypical cultural settings? *Electronic Journal of e-Learning*, 15(3), 235-243.
- Mueller, J., Wood, E., Willoughby, T., Ross, C., & Specht, J. (2008). Identifying decimating variables between teachers who fully integrate computers and teachers with limited integration. *Computers & Education*, 51(4), 1523-1537.
- Mumtaz, S. (2000). Factors affecting teachers' use of information and communications technology: A review of the literature. *Journal of Information Technology for Teacher Education*, 9(3), 319-341.
- Mupenzi, A., Mude, W., & Baker, S. (2020). Reflections on COVID-19 and impacts on equitable participation: The case of culturally and linguistically diverse migrant and/or refugee (CALDM/R) students in Australian higher education. *Higher Education Research and Development*, 39(7), 1337-1341.

- Murati, R., & Ceka, A. (2017). The use of technology in educational teaching. *Journal of Education and Practice*, 8(6), 197-199.
- Musti-Rao, S., Cartledge, G., Bennet, J. G., & Council, M. (2014). Literacy instruction using technology with primary-age culturally and linguistically diverse learners. *Intervention in School and Clinic*, 50(4), 195-202. <https://doi.org/10.1177/1053451214546404>
- Nath, R., & Chen, L., & Muyingi, H. N. (2015). An empirical study of the factors that influence in-class digital distraction among university students: A U.S.–Namibia cross-cultural study. *Information Resources Management Journal*, 28(4), 1-18.
- Niemiec, T., & Lachowicz-Tabaczek, K. (2015). The moderating role of specific self-efficacy in the impact of positive mood on cognitive performance. *Motivation and Emotion*, 39(4), 4980505.
- Nordlöf, C., Hallström, J., & Höst, G. E. (2019). Self-efficacy or context dependency? Exploring teachers' perceptions of and attitudes towards technology education. *International Journal of Technology and Design Education*, 29(1), 123-141.
- O'Hara, S., & Pritchard, R. H. (2008). Meeting the challenge of diversity: Professional development for teacher educators. *Teacher Education Quarterly*, 35(1), 43-61.
- O'Hara, S., & Pritchard, R. H. (2009). Vocabulary development in the science classroom: using hypermedia authoring to support English learners. *Tapestry Journal*, 1(1), 15-29.
- Ortman, J. (2012). *A look at the US population in 2060: Materials for C-Span segment on population projections*. [https://www.census.gov/newsroom/releases/archives/miscellaneous/cb12\\_-tps91.html](https://www.census.gov/newsroom/releases/archives/miscellaneous/cb12_-tps91.html)
- O'Sullivan, M. P. (2015). Laboratories for inequality: State experimentation and

- educational access for English language learners. *Duke Law Journal*, 64, 671-715.
- Pajares, F. (1996). Self-efficacy beliefs in academic settings. *Review of Education Research*, 66(4), 543-578.
- Pajares, F., & Schunk, D. H. (2001). *Self-beliefs and school success: Self-efficacy, self-concept, and school achievement*. In R. Riding & R. Sayner (Eds.), *Perception* (pp. 239-266). Ablex.
- Pan, S. C., & Franklin, T. (2011). In-service teachers' self-efficacy, professional development, and Web 2.0 tools for integration. *New Horizons in Education*, 59(3), 28-40.
- Paraskeva, F., Bouta, H., & Papagianni, A. (2008). Individual characteristics and computer self-efficacy in secondary education teachers to integrate technology in educational practice. *Computers & Education*, 50(3), 1084-1091. <http://doi.org/10.1016/j.compedu.2006.10.006>
- Park, J., Chu, H-E., & Martin, S. (2016). Exploring how Korean teacher's attitudes and self-efficacy for using inquiry and language based teaching practices impacts learning for culturally and linguistically diverse students: Implications for science teacher education. *Eurasia Journal of Mathematics, Science & Technology Education*, 12(7), 1799-1841.
- Patton, M. Q. (2015). *Qualitative research & evaluation methods: Integrating theory and practice* (4th ed.). Sage.
- Pfitzner-Eden, F. (2016). Why do I feel more confident? Bandura's sources predict preservice teachers' latent changes in teacher self-efficacy. *Frontiers in Psychology*, 7(1), 19-20.
- Phillips, G. W. (2015). Impact of design effects in large-scale district and state

- assessments. *Applied Measurement in Education*, 28(1), 33-47.
- Phillips, R., Kennedy, G., & McNaught, C. (2012). The role of theory in learning technology evaluation research. *Australasian Journal of Educational*, 28(7), 1103-1118.
- Plough, B. (2017). Recognizing and understanding effective blended learning in secondary classrooms. *Leadership*, 24(1), 28-31.
- Predmore, C., Kushner, R., & Anderson, C. J. (2017). So, that is what you said? *Journal of Invitational Theory and Practice*, 23, 91-97.
- Prince, J. (2017). English language learners in a digital classroom. *CATESOL Journal*, 29(1), 51-73.
- Pritchard, R., & Monroe, S. (2002, October 2-3). *Bridging the gap between readers and texts with strategic reading comprehension instruction* [Paper presentation]. California State University Reading Conference, Los Angeles, CA, United States.
- Rankin, J., & Brown, V. (2016). Creative teaching method as a learning strategy for student midwives: A qualitative study. *Nurse Education Today*, 38(1), 93-100.
- Rao, K. (2015). Universal design for learning and multimedia technology: supporting culturally and linguistically diverse students. *Journal of Educational Multimedia and Hypermedia*, 24(2), 121-137.
- Reddy, S. L., Bubonia, J., & Parr, J. (2020). Technology in education: Learning opportunities for teachers and students. *Journal of Family and Consumer Sciences*, 112(1), 46-50.
- Reese, L., Richards-Tutor, C., Hansuvadha, N., & Xa, S. (2018). Teachers for inclusive, diverse urban settings. *Issues in Teacher Education*, 27(1), 17-26.
- Reider, K., & Wooleyhand, C. (2017). English learners: A principals' handbook.

*Principal*, 43(1), 52-53.

- Reinsfield, E. (2020). A future-focused conception of the New Zealand curriculum: culturally responsive approaches to technology education. *International Journal of Technology and Design Education*, 30(3), 427-435.
- Reyneke, J. A. (2020). *What drives educators: A mixed methods study on the impact of motivations and attitudes on technology integration practices in the K-8 classroom* (Publication No. 28986008) [Doctoral dissertation, Pepperdine University]. ProQuest Dissertations and Theses Global.
- Richardson, J. W., & Sterrett, W. L. (2018). District technology leadership then and now: A comparative study of district technology leadership from 2001 to 2014. *Educational Administration Quarterly*, 54(4), 589-616.
- Ruggiero, D., & Mong, C. J. (2015). The teacher technology integration experience: Practice and reflection in the classroom. *Journal of Information Technology Education Research*, 14, 161-178.
- Sadick, A. (2008). Digital storytelling: A meaningful technology-integrated approach for engaged student learning. *Educational Technology, Research and Development*, 56(4), 487-488.
- Saldaña, J. (2015). *The coding manual for qualitative researchers* (3rd ed.). Sage.
- Salehi, H., & Salehi, Z. (2012). Challenges for using ICT in education: Teachers' insights. *International Journal of e-Education, e-Business, e-Management and e-Learning*, 2(1), 40-41.
- Salva, C., & Matis, A. (2017). *Boosting achievement: Reaching students with interrupted or minimal education*. Seidlitz.
- Sang, G., Valcke, M., van Braak, J., & Tondeur, J. (2010). Student teachers' thinking

- processes and ICT integration: predictors of prospective teaching behaviors with educational technology. *Computers & Education*, 54(1), 103-112.
- Saxena, A. (2017). Issues and impediments faced by Canadian teachers while integrating ICT in pedagogical practice. *Turkish Online Journal of Educational Technology*, 16(2), 58-70.
- Sayer, P., & Braun, D. (2020). The disparate impact of covid-19 remote learning on English learners in the United States. *TESOL Journal*, 11(3), 1-6.
- Scherer, R., Tondeur, J., Siddiq, F., & Baran, E. (2018). The importance of attitudes toward technology for pre-service teachers' technological, pedagogical, and content knowledge: Comparing structural equation modeling approaches. *Computers in Human Behavior*, 80(1), 67-80.
- Schoepp, K. (2005). Barriers to technology integration in a technology-rich environment. *Learning and Teaching in Higher Education: Gulf Perspectives*, 2(1), 1-24.
- Schunk, D. H., & DiBenedetto, M. K. (2020). Motivation and social cognitive theory. *Contemporary Educational Psychology*, 60(2), 211-212.
- Shipherd, A. M. (2019). "This doesn't look too hard": A mixed methods exploration of self-efficacy and sources of self-efficacy information in a novel puzzle task. *Journal of Applied Social Psychology*, 49(4), 1-13.
- Smith, J. A., Flowers, P., & Larkin, M. (2012). *Interpretative phenomenological analysis: Theory, method and research*. Sage.
- Song, L. (2018). Improving pre-service teachers' self-efficacy on technology through service learning. *Canadian Journal of Action Research*, 19(1), 22-32.
- Southerland, S. (2012). Is it impossible to teach "science for all" in a climate of accountability? Educational policy and the equitable teaching of science. In J.

- Bianchini, V. Akerson, B. Calabrese, O. Lee, & A. Rodrigues (Eds.), *Moving the equity agenda forward: Equity research, practice, and policy in science education* (pp. 113-121). Springer.
- Stipanovic, N., Stringfield, S., & Witherell, E. (2017). The influence of a career pathways model and career counseling on students' career and academic self-efficacy. *Peabody Journal of Education, 92*(1), 209-221.
- Su, B. (2009). Effective technology integration: Old topic, new thoughts. *International Journal of Education and Development using Information and Communication Technology, 5*(2), 161-171.
- Tarbutton, T. (2018). Leveraging 21st-century learning & technology to create caring diverse classroom cultures. *21st-Century Learning & Multicultural Education, 22*(1), 4-6.
- Texas Education Agency. (2010). *District summary: Arlington ISD*. <http://loving1.tea.state.tx.us/lonestar/Reports/Summary2010/District/AAG1-DIST-SchoolDist-PDF-en-220901.pdf>
- Tondeur, J., van Braak, J., Ertmer, P. A., & Ottenbreit-Leftwich, A. (2016). Understanding the relationship between teachers' pedagogical beliefs and technology use in education: A systematic review of qualitative evidence. *Educational Technology Research and Development, 65*(3), 555-575. <http://doi.org/10.1007/s11423-016-9481-2>
- Tondeur, J., van Keer, H., van Braak, J., & Valcke, M. (2008). ICT integration in the classroom: Challenging the potential of a school policy. *Computers & Education, 36*(3), 231-250.
- Tsayang, G., Batane, T., & Majuta, A. (2020). The impact of interactive smart boards on

- students' learning in secondary schools in Botswana: a students' perspective. *International Journal of Education and Development using information and Communication Technology (IJEDICT)*, 16(2), 22-39.
- Tschannen-Moran, M., Woolfolk Hoy, A., & Hoy, W. K. (1998). Teacher self-efficacy: meaning and measure. *Review of Educational Research*, 68(2), 202-248.
- Tschannen-Moran, M., & Hoy, A. W. (2001). Teacher efficacy: Capturing an elusive construct. *Teaching and Teacher Education*, 17(7), 783-805.
- Uluyol, Ç., & Sahin, Ş. (2016). Elementary school teachers' ICT use in the classroom and their motivators for using ICT. *British Journal of Educational Technology*, 47(1), 65-75.
- Unal, Z., & Unal, A. (2011). Evaluating and comparing the usability of web-based course management systems. *Journal of Information Technology Education*, 10(1), 19-38.
- U.S. Department of Education. (2017). *Our nation's English learners*. <https://www2.ed.gov/datastory/el-characteristics/index.html>
- U.S. Department of Education. (2019). *Trends in high school dropout and completion rates in the United States: 2018*. <https://nces.ed.gov/pubs2019/2019117.pdf>
- Vatanartiran, S., & Karadeniz, S. (2015). A needs analysis for technology integration plan: Challenges and needs of teachers. *Contemporary Educational Technology*, 6(3), 206-220.
- Vázquez-Montilla, E., Just, M. & Triscari, R. (2014). Teachers' dispositions and beliefs about cultural and linguistic diversity. *Universal Journal and Educational Research*, 2(8), 577-587.
- Villegas, A. M., & Lucas, T. (2002). *Educating culturally responsive teachers: A*

*coherent approach*. State University of New York Press.

- Wade, W., Rasmussen, K., & Fox-Turnbull, W. (2013). Can technology be a transformative force in education? *Preventing School Failure, 57*, 162-170. <https://doi.org/10.1080/1045988X.2013.795790>
- Wang, C. H., Harrison, J., Cardullo, V., & Lin, X. (2018). Exploring the relationship among international students' English self-efficacy, using English to learn self-efficacy, and academic self-efficacy. *Journal of International Students, 8*(1), 233-250.
- Wang, H., Hall, N. C., & Rahimi, S. (2015). Self-efficacy and causal attributions in teachers: Effects on burnout, job satisfaction, illness, and quitting intentions. *Teaching and Education, 47*(2), 120-130.
- Washburn, G. N. (2008). Alone, confused, and frustrated: Developing empathy and strategies for working with English language learners. *Clearing House, 81*(2), 247-250. doi:10.3200/TCHS.81.6.247-250
- Watson, S., & Marschall, G. (2019). How a trainee mathematics teacher develops teacher self-efficacy. *Teacher Development, 23*(4), 469-487.
- Wong, L. (2013). Student engagement with online resources and its impact on learning outcome. *Journal of Information Technology Education, 12*(2), 221-237.
- Wood, E., Zivcakova, L., Gentile, P., Archer, K., Pasquale, D., & Nosko, A. (2012). Examining the impact of off-multitasking with technology on real-time classroom learning. *Computers & Education, 58*(1), 365-374.
- Wood, R., & Bandura, A. (1989). Impact of conceptions of ability on self-regulatory mechanisms and complex decisions making. *Journal of Personality and Social Psychology, 56*(3), 407-415. <https://doi.org/10.1037/0022-3514.56.3.407>

- Woolfolk, A. (1990). *Educational psychology* (4th ed.). Prentice-Hall.
- Woolfolk, A., Rossoff, B., & Hoy, W. K. (1990). Teachers' sense of efficacy and their beliefs about managing students. *Teaching and Teacher Education*, 6(2), 137-148.
- World-Class Instructional Design and Assessment Consortium. (2015). *SLIFE: Students with limited or interrupted formal education*. <https://wida.wisc.edu/resources/students-limited-or-interrupted-formal-education-slife>
- Wright, V. H., & Wilson, E. K. (2005). From preservice to in service teaching: A study of technology integration. *Journal of Computing in Teacher Education*, 22(2), 49-55.
- Yilmaz, A. (2009). Self-efficacy perceptions of prospective social studies teachers in relation to history teaching. *Education*, 129(3), 506-620.
- Yin, R. K. (2018). *Case study research and applications* (6th ed.). Sage.
- Yoon, J., Jin-Kim, K., Martin, L. A. (2016). Culturally inclusive science teaching (CIST) model for teachers of culturally and linguistically diverse students. *Journal for Multicultural Education*, 10(3), 322-338. <https://doi.org/10.1108/JME-01-2016-0012>
- Yu, T.-K., Lin, M.-L., & Liao, Y.-K. (2017). Understanding factors influencing information communication technology adoption behavior: The moderators of information literacy and digital skills. *Computers in Human Behavior*, 71(2), 196-208. <https://doi.org/10.1016/j.chb.2017.02.005>
- Zhong, L., & Wang, S. (2019). The roles of instructional technologist in supporting k-12 CCSS transition. *International Journal of Technology in Teaching and Learning*, 12(2), 77-88.

Appendix A  
Participant Demographics

## Participant Demographics

<b>Participant</b>	<b>Educational and Professional Background</b>	<b>Years of teaching Experience</b>	<b>Ethnicity</b>	<b>Age</b>	<b>How often they integrate technology into daily lessons?</b>
1 Rosie	Bachelors in ESOL K-12, Masters in Curriculum and Instruction Masters in Bilingual education, EdD in Organization leadership, National Board Certified, VDOE teaching certification ESOL K-12 and Spanish	20 years	Puerto Rican parents born in Texas	43	everyday
2 Debbie	Masters, VDOE certification in supervision and social studies	25 years	Caucasian	48	everyday
3 Emily	Masters in ESOL, VDOE certification in Mathematics prek-6 <sup>th</sup> and ESOL	10 years	Caucasian	33	everyday
4 Suzanne	Master's in economics, Bachelor's in economics and political science, VDOE certification in Pre-K-12 <sup>th</sup> Social studies and ESOL	15 years	Caucasian	50	everyday
5 Jen	Master's in teaching with specialty in Special Education, bachelor's in psychology, VDOE certification in specific learning disabilities and elementary education	23 years	Asian/Korean	44	3-4 times a week
6 Nancy	Master's in education, bachelor's in physical education, VDOE certified in health and physical education (pre-K-12)	20 years	Caucasian	64	3-4 times a week (prior to Covid) everyday
7 Wanda	Master of Arts in communication, Bachelor's in science and education, VDOE certified in English	24 years	African American	73	everyday

	and Special Education				
8 Leslie	Bachelor's in clinical lab science with emphasis on biomedical microbiology, and a minor in chemistry, holds a license in clinical microbiology (6 <sup>th</sup> -12 <sup>th</sup> grade) VDOE certified in Earth Science and Biology	10 years	Middle Eastern, Russian, German, Caucasian	49	everyday

Appendix B  
Interview Guide

## Interview Guide

**Time of Interview:** \_\_\_\_\_**Date:** \_\_\_\_\_**Place:** \_\_\_\_\_**Interviewer:** Eliana Molina**Interviewee:** \_\_\_\_\_**Subject:** \_\_\_\_\_

Hello! How are you doing? I would like to first thank you for taking time to participate in this study. As you know, I am currently a student conducting a study about the integration of technology in the classroom when working with culturally and linguistically diverse (CLD) students. I am eager to conduct this interview as I will learn from you, an expert who is in the trenches working with CLD students. There is no right or wrong answer as this interview is about your experiences integrating technology with this special population. Please provide as many details as possible when answering the questions as this will assist me in understanding this topic, in-depth.

This interview will not take more than hour. There is a total of nine questions, which are clustered into three groups. I would like to remind you that this will be confidential, and the identity of all participants will not be revealed as I will be utilizing pseudonyms.

Before beginning the actual interview questions, I will gather some information about your professional background and demographics. This will assist me in finding similarities when analyzing the data.

**What is your educational background? What degrees do you have?**

**In what areas are you certified?**

**How many years have you been teaching?**

**What is your ethnicity?**

**How old are you?**

**How often do you integrate technology into your daily lessons?**

1-2 a week \_\_\_\_\_

3-4 a week \_\_\_\_\_

Everyday \_\_\_\_\_

Thanks so much for providing me with this information! Now, we will begin with the questions related to the study. As I previously mentioned, the questions are in three clusters.

### **Technology, Self-Efficacy, and Challenges**

The first set of questions will be about technology, self-efficacy, and challenges. When I ask about technology, I am referring to what technology do you integrate when teaching. For instance, LCD projector, laptops, iPad and so on. As far as self-efficacy, I am referring to how comfortable you feel when integrating the different types of technology. This includes your attitude and beliefs towards learning how to use and integrate technology during instruction. Lastly, challenges are basically the obstacles you encounter when integrating technology. Do you have any questions before we begin?

Let's begin.

1. First, I am interested in what technology you use in the classroom? I would also like to know how you feel when utilizing them. For instance, do you use the LCD projector? If so, in what capacity and how comfortable do you feel utilizing it?
2. The second question is: have you encountered challenges trying to incorporate technology into daily lessons? Can you provide examples of some these challenges?
3. When you encounter these challenges, how do you address them? Can you please provide examples of past experiences?
4. Question number five is related to self-efficacy. When I say self-efficacy I mean

how comfortable you feel when integrating the different types of technology. This includes your attitude and beliefs towards learning how to use and integrate technology during instruction. I am interested in understanding your level of comfort when utilizing technology that is provided by the county. If you do not feel prepared, what is lacking?

5. What do you believe is needed to ensure the use of technology is a smooth transition for teachers and students?

### **Culturally and Linguistically Diverse (CLD) Students**

We have completed all the questions about technology, self-efficacy, and challenges. For the next two questions, I will be asking about culturally and linguistically diverse students.

6. I will ask for your opinions and experiences for this first question. As teachers, we teach a diverse student body. Students have different needs, challenges, strengths and backgrounds. What do you think is needed to effectively integrate technology into daily instruction when teaching CLD students, specifically?
7. The last question in this cluster is the following: based on your observations, what challenges do CLD students encounter when utilizing technology in the classroom?

### **Academic Growth**

We are almost done as this is the last cluster which has two questions. The first question is:

8. How does technology impact the academic growth of CLD students? Can you please provide examples of how technology enhances or limits academic growth? You may have examples of enhancing and limiting experiences.
9. And we are now at the final question. What advice would you give to a new teacher who is using technology in a classroom with CLD students?

Again, thanks so much for your time and for sharing this important information with me. Do you have any questions or would like to make additional comments about this topic?

Thanks, and have a wonderful day!

Appendix C  
Coding Manual

## Coding Manual

<b>Type of Code</b>	<b>Color</b>
<b>Descriptive</b>	yellow
<b>Emotional</b>	green
<b>Eclectic</b>	blue
<b>Envivo</b>	pink/purple

## Interviews (naming codes)

Types	Codes	Rationale
<b>Descriptive Codes</b>	<p><b>Inequities</b></p> <ul style="list-style-type: none"> <li>- lack of support</li> <li>-no support in alternative schools</li> <li>-inadequate staffing allocation</li> <li>-student devices (resources)</li> <li>-one-on-one devices</li> <li>- lack of resources/online learning</li> </ul> <p><b>Lack of teacher training</b></p> <ul style="list-style-type: none"> <li>-uncomfortable teaching during pandemic/online</li> <li>-inappropriate rollout</li> <li>-lack of training</li> <li>-self-teaching/using Canvas</li> <li>-learn by doing</li> <li>-self-teaching</li> <li>-unclear expectations</li> <li>-Learning by doing</li> <li>-forced to use Canvas because of pandemic</li> </ul> <p><b>Students' barriers</b></p> <ul style="list-style-type: none"> <li>-challenges with technology</li> <li>- limited tech skills</li> <li>-students with no tech skills</li> <li>- students' lack of tech skills</li> <li>-student needs/support</li> <li>-one-on-one support</li> <li>-student support needs</li> <li>- lack of understanding tech</li> <li>-Canvas-consistency and simplicity</li> <li>- Need to make content accessible to students</li> <li>-need to inquire students' tech skills</li> <li>-survey students about tech skills</li> <li>- students' diverse experiences</li> <li>- student lack of vocabulary</li> <li>- tech lack of vocabulary</li> </ul> <p><b>Tech negative impact</b></p> <ul style="list-style-type: none"> <li>-Googling answers</li> <li>- Cutting and pasting/ plagiarism</li> </ul> <p><b>Benefits of "old school"</b></p>	<p><b>Inequities-</b> I decided to name this code inequities as CLD students are encountering them. For instance, students do not have access to Internet at home, but are given them a device with the expectation that they can do homework online. In addition, this school is a program and they don't have the same tech support as the comprehensive schools do. In addition, there is inadequate staffing to meet the needs and tech demands of CLD students. These are challenges that negatively impact CLD students' academic achievement as they don't have access to high quality educational opportunities, and this is an equity issue. Also, programs chosen by the county are not adequate for CLD students. Note: although all students have a device, they do not have the same access to internet</p> <p><b>Lack of teacher training-</b> I decided to name this code lack of teacher training because teachers are not being adequately trained. They are not giving them the opportunity to learn the program/technology. In addition, there are unclear expectations, which is also part of teacher training because expectations should be communicated during professional development. Often, teachers are expected to implement new software/technology without any training. Therefore, many of them rely on each other and self-teaching.</p> <p><b>Students' barriers-</b> I decided to name this code student barriers as the data is depicting all of the challenges that students encounter when teachers try to implement technology into daily instruction. Barriers include: lack of</p>

	<ul style="list-style-type: none"> <li>-unreliable technology</li> <li>-relying on old school/traditional materials</li> <li>-traditional teaching techniques</li> <li>-more beneficial with CLD students</li> <li>-paper and pencil vs. technology (paper better)</li> <li>-Tangible copy needed</li> <li>- value of reading in paper</li> <li>- academic benefits of utilizing tangible copy</li> <li>-tactile better results</li> <li>-balance tech and old school</li> <li>-benefits of hands-on activities-coloring</li> </ul> <p><b>Lack of Support</b></p> <ul style="list-style-type: none"> <li>-unreliable IT</li> <li>-need for consistency</li> <li>-changes in education</li> <li>-frustration</li> </ul> <p><b>Importance of teaching technology</b></p> <ul style="list-style-type: none"> <li>-importance of developing 21<sup>st</sup> century skills</li> <li>-need for balance (tech and traditional teaching)</li> <li>-need to implement tech/future</li> </ul>	<p>internet, lack of tech skills, lack of understanding, lack of vocabulary, lack of consistency and simplicity. For many, this is the first time they are using a computer. Therefore, students need a lot of one-on-one support.</p> <p><b>Tech negative impact</b> I decided to name this code Tech negative impact as the data is related to how students' academic achievement is negatively impacted by the use of technology. Teacher indicated that technology hinders students' critical thinking skills, among other skills.</p> <p><b>Benefits of "old school"</b> – I decided to name this code benefits of "old school" as the teacher indicated that technology hinders students' learning and they do better when she uses "traditional" techniques such as using paper, pencil, books, tangible copies.</p> <p><b>Lack of Support</b> I decided to name this code lack of support as the data indicates that teachers are not being supported. For instance, the participant indicated that the IT person is there part time and is often not available. In addition, there are many changes in education, and participant indicated that these changes are made without any type of guidance resulting in frustration.</p> <p><b>Importance of teaching technology</b>- I decided to name this code importance of teaching technology as it is essential to teach them so students can compete in the job market. In addition, they should know how to use technology so they can succeed in their classes. They need to have the basic foundational skills.</p>
<p><b>In Vivo Codes</b></p>	<p><b>Students' barriers</b></p> <ul style="list-style-type: none"> <li>-no tech skills</li> <li>-unrealistic expectations</li> <li>-anxiety</li> <li>- stress</li> <li>-embarrassment</li> <li>- first encounter with technology (SLIFE)</li> </ul>	

Eclectic Codes	<p><b>Inequities</b></p> <ul style="list-style-type: none"> <li>- Inadequate programs for CLD students</li> <li>-no Internet connection at home</li> </ul> <p><b>Lack of teacher training</b></p> <ul style="list-style-type: none"> <li>-Teacher frustration</li> <li>-pandemic/how to teach online</li> <li>-lack of efficacy using technology</li> <li>-not used Canvas because didn't know how to use it</li> <li>- not sure how to use programs</li> <li>-lack of self-efficacy</li> <li>-Uncomfortable using programs</li> <li>-making assumptions</li> <li>-relying on colleagues</li> <li>-need for consistency</li> </ul> <p><b>Student barriers</b></p> <ul style="list-style-type: none"> <li>-hindered self-esteem</li> <li>- embarrassment</li> <li>-socio-emotional needs</li> <li>-surveying students/access and tech schools</li> <li>- accessing tech comfort skills</li> <li>-need for tech vocabulary development</li> </ul> <p><b>Tech Negative Impact</b></p> <ul style="list-style-type: none"> <li>-cut and paste</li> <li>-plagiarism</li> <li>-tech-hinders higher order thinking skills</li> </ul> <p><b>Benefits of "old school"</b></p> <ul style="list-style-type: none"> <li>-benefits of teaching in person</li> <li>- identifying in map/paper</li> </ul> <p><b>Lack of support</b></p> <ul style="list-style-type: none"> <li>-teachers have to problem solve</li> </ul>	
Emotion Codes	<p><b>Inequities</b></p> <ul style="list-style-type: none"> <li>-some students have tech and assistance at home and others don't</li> </ul> <p><b>Lack of training</b></p> <ul style="list-style-type: none"> <li>-Teachers' feelings -frustration</li> <li>-furious/frustration</li> <li>-inadequate rollout</li> </ul> <p><b>Students' barriers</b></p>	

	<p>-language barriers/challenge</p> <p><b>Lack of support</b></p> <p>-frustration</p> <p>-challenges with tech</p> <p>-teachers have to problem solve - inconsistency</p>	
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## II. Categories

Category 1 CLD Student Challenges	Category 2 Impact on CLD students' learning	Category 3 Teachers and technology	Category 4 Importance of Technology
<p>I chose student challenges for this category as the words used for the codes are related to challenges students have including inequities in educational opportunities and the barriers students have that include lack of resources, lack of exposure, socio-emotional and language barriers. <b>This was a reoccurring theme in all interviews.</b></p>	<p>I chose to name this category impact on CLD students' learning as a reoccurring statement was that technology has a negative impact on CLD student learning and that "traditional" strategies are more beneficial when working with this population. <b>This was a reoccurring theme in most interviews.</b></p>	<p>I chose to name this category teachers and technology as lack of teacher training is related to their inability to use some of the technology and their self-efficacy. Teachers shared frustration and how the county does not provide adequate training. <b>This was a reoccurring theme in all interviews.</b></p>	<p><b>After analysis, I don't think this will be part of any theme.</b></p>
<p><b>Inequities</b></p> <ul style="list-style-type: none"> <li>- lack of support</li> <li>-no support in alternative schools</li> <li>-inadequate staffing allocation</li> <li>-student devices (resources)</li> <li>-one-on-one devices</li> <li>- lack of resources/online learning</li> <li>- Inadequate programs for CLD students</li> <li>-no Internet connection at home</li> <li>-some students have tech and assistance at home and others don't</li> </ul>	<p><b>Benefits of "old school"</b></p> <ul style="list-style-type: none"> <li>-unreliable technology</li> <li>-relying on old school/traditional materials</li> <li>-traditional teaching techniques</li> <li>-more beneficial with CLD students</li> <li>-paper and pencil vs. technology (paper better)</li> <li>-Tangible copy needed</li> <li>- value of reading in paper</li> <li>- academic benefits of utilizing tangible copy</li> <li>-tactile better results</li> <li>-balance tech and old school</li> <li>-benefits of hands- on activities-coloring</li> </ul>	<p><b>Lack of teacher training</b></p> <ul style="list-style-type: none"> <li>-uncomfortable teaching during pandemic/online</li> <li>-inappropriate rollout</li> <li>-lack of training</li> <li>-self-teaching/using Canvas</li> <li>-learn by doing</li> <li>-self-teaching</li> <li>-unclear expectations</li> <li>-Learning by doing</li> <li>-forced to use Canvas because of pandemic</li> <li>-Teacher frustration</li> <li>-pandemic/how to teach online</li> <li>-lack of efficacy using technology</li> <li>-not used Canvas because didn't know how to use it</li> </ul>	<p><b>Importance of teaching technology</b></p> <ul style="list-style-type: none"> <li>-importance of developing 21<sup>st</sup> century skills</li> <li>-need for balance (tech and traditional teaching)</li> <li>-need to implement tech/future</li> </ul>

<p><b>Students' barriers</b></p> <ul style="list-style-type: none"> <li>-challenges with technology</li> <li>- limited tech skills</li> <li>-students with no tech skills</li> <li>- students' lack of tech skills</li> <li>-student needs/support</li> <li>-one-on-one support</li> <li>-student support needs</li> <li>- lack of understanding tech</li> <li>-Canvas-consistency and simplicity</li> <li>- Need to make content accessible to students</li> <li>-need to inquire students' tech skills</li> <li>-survey students about tech skills</li> <li>- students' diverse experiences</li> <li>- student lack of vocabulary</li> <li>-tech lack of vocabulary</li> <li>-no tech skills</li> <li>-unrealistic expectations</li> <li>-anxiety</li> <li>-stress</li> <li>-embarrassment</li> <li>- first encounter with technology (SLIFE)</li> <li>-hindered self-esteem</li> <li>- embarrassment</li> <li>-socio-emotional needs</li> <li>-surveying students/access and tech schools</li> <li>- accessing tech comfort skills</li> <li>-need for tech vocabulary development</li> <li>-language barriers</li> </ul>	<ul style="list-style-type: none"> <li>-benefits of teaching in person</li> <li>- identifying in map/paper</li> </ul> <p><b>Tech Negative Impact</b></p> <ul style="list-style-type: none"> <li>-cut and paste</li> <li>-plagiarism</li> <li>-tech-hinders higher order thinking skills</li> <li>-Googling answers</li> <li>- Cutting and pasting/ plagiarism</li> </ul>	<ul style="list-style-type: none"> <li>- not sure how to use programs</li> <li>-lack of self-efficacy</li> <li>-Uncomfortable using programs</li> <li>-making assumptions</li> <li>-relying on colleagues</li> <li>-need for consistency</li> <li>-Teachers' feelings - frustration</li> <li>-furious/frustration</li> <li>-inadequate rollout</li> <li>-frustration</li> <li>-challenges with tech</li> <li>-teachers have to problem solve</li> <li>-inconsistency</li> <li>-unreliable IT</li> <li>-need for consistency</li> <li>-changes in education</li> <li>-frustration</li> </ul>	
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