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NARROWING THE DIGITAL DIVIDE: INSTRUCTIONAL PRACTICES PROMOTING GROWTH MINDSET TO ADDRESS STUDENTS' DIGITAL LITERACY NEEDS IN A SECONDARY SCHOOL LEARNING ENVIRONMENT

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ADDRESS STUDENTS' DIGITAL LITERACY NEEDS IN A SECONDARY
SCHOOL LEARNING ENVIRONMENT

by

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Dedication

This dissertation is dedicated to my husband, Scott and my children Caitlin, Stephen, Keigan, and Gannon. To Scott: Thank you for always raising the bar and for always believing in me. You are my rock. To my children: Let my achievement always be a guiding force in your life to continuously strive for what you want and to make your dreams a reality.

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Abstract

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The purpose of this explanatory sequential mixed methods study was: (1) to explore the ways in which high school teachers use instructional practices that promote a growth mindset among their students, (2) how those practices are used to improve digital literacy, and (3) how these practices evolved during the transition from face-to-face instruction to remote instruction. This study aimed to explore not only how teachers are using instructional strategies to promote growth mindset, but how those strategies are helping to address students' digital literacy needs with the intent to narrow the digital divide. For this study, the case-selection variant of mixed message was used, placing a greater emphasis on the qualitative phase of the study. The survey for this study was used for the purpose of identifying participants for the qualitative interviews. The qualitative phase, which included in-depth, semi-structured interviews uncovered a number of themes relating to teachers' instructional practices that promote growth mindset, digital literacy development, remote learning, and the digital divide. In addition to the findings, implications for future research and recommendations are discussed.

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Chapter 1

Introduction

One of the main goals of public education has been to prepare our nation's youth for responsible and fruitful engagement in a democratic society. The current digital age requires this agenda to respond to the ever-growing forms of participation made possible by the variety and ubiquity of digital media (Kahne, et al., 2018). Therefore, it has become necessary to provide students with the opportunities to develop digital literacy (i.e., finding, assessing, using, sharing, and creating digital media) as they develop skills in reading, writing, and mathematics. Building digital literacies will also prepare students to engage in civic responsibilities, such as voting and social problem-solving (Kahne, et al., 2018). Moreover, digital literacy provides students with the 21st Century skills needed to become contributing members in our global society.

Technology has become an essential component of teaching and instruction and has the potential to improve student learning. Teachers use a wide variety of technology devices in their classrooms to provide instruction in all academic areas. These devices include overhead projectors, Elmoes, interactive whiteboards, and perhaps most importantly computers, educational software and learning platforms, and the Internet. In fact, computer-based instruction (CBI) is meant to engage students in meaningful ways and to tailor instruction to meet their diverse and individual learning needs (Anand & Ross, 1987; Kulik, 1991; Ross, 2020). Technology expansion in educational settings coexists with issues such as accountability measures related to increasing student achievement, teachers' responsibility for balancing students' social-emotional learning (SEL) with performance expectations (i.e. good grades, standardized test scores, college

prep, etc.), and fostering collaboration between school and community in order to

encourage positive school-to-home connections and parent involvement in their students'

education (Cohen et al. 2017; Farley-Ripple et al. 2018; Willis et al. 2019). The goals of

technology infusion in education include digital literacy skill development, equitable

access to devices and digital literacy instruction, and supporting critical thinking and

intellectual development (Ross, 2020). Such goals carry with it an intention to improve

student learning and performance and increase student interest and motivation. Until

recently, technology and CBI were among many other teaching tools and strategies. Now,

they are the front and center of every learning environment connecting students both at

home and at school.

The Digital Divide

The digital divide is "a simplistic phrase used to explain the gap between people

who can easily use and access technology, and those who cannot. The term digital divide

has been in common use to refer to this sense of technological haves and have-nots for

over a decade" (West, 2011, p. xxiv). This definition highlights the fundamental issues

characteristic of the digital divide discussion; specifically, some individuals are

privileged when it comes to technology access and ability. This basic definition also

reveals a certain "power dynamic", suggesting limitations and deficits in those who are

unable to acquire knowledge from the Internet when compared to the benefits and

advantages in those who are able. Alarmingly, the lack of access and ability within

America is mostly assigned to minority groups and individuals with limited means

(Cohron, 2015). The digital divide is actually a complex, multi-dimensional issue and a

very wide-ranging topic to approach. However, there are several common themes that

have emerged in the research over time that remain relevant in the current literature. Therefore, it is necessary to examine the digital divide over time, so we can see the impact of the underlying socioeconomic factors, the newer understanding of the digital divide as it relates to both access and digital literacy (Cohron, 2015), and the role of instruction in narrowing the divide.

Internet access in the U.S. is unevenly distributed across the country, disproportionately affecting individuals from low-socioeconomic backgrounds. In 2018, the U.S. Census estimated that approximately 15% of Americans do not have internet service in their home (United States Census Bureau, 2018). In 2019, it was reported that more than 25% of families across the U.S. lacked internet access (Pew Research Center, 2019). This lack of access affects low-income earners as much as two times the national average (Duffy & Tappe, 2020). In fact, in Anderson's Pew Research report (2019), she uncovered links between household income, race, and education levels and home internet connectivity and disparities to access. While internet service and access is mainly considered a "rural issue," in urban areas, where services are prolific, affordability is what hinders access (Duffy & Tappe, 2020). In rural areas, internet service providers simply do not provide the network because of the lack of financial incentives (Duffy & Tappe, 2020). However, in urban areas, service providers make exceptional profits, benefitting only those who can afford access. This creates a divide in access to technology and digital resources as well as individuals' abilities to become proficient in its use.

Digital Divide: Level One

The digital divide consists of three levels: the first of which highlights access to devices and the Internet; the second highlights the use of digital media when access is available; and the third highlights the valuable effects of Internet use (Osborne & Morgan, 2016; Tierney & Kolluri, 2018; Lutz, 2019; Scheerder et al., 2017). While level-one access to technology has improved significantly since the early 1990s, with less expensive internet options, and computers and other devices being provided to low-income families, there continues to be an enduring lack of internet access concentrated among individuals of color, disadvantaged households, and those living in rural areas (Osborne & Morgan, 2016; Lieberman, 2020a). In communities, where many residents are people of color, there is significantly less access to home broadband as compared to the rest of the country (Shelton & Siefer, 2020). According to additional reports, "34 percent of Black households and 39 percent of Latinx households do not have a wired broadband connection" (Pew Research Center, 2019). In households where residents earn less than $20,000 per year, it's more than 35% (Shelton & Siefer, 2020). Furthermore, Native Americans are the "least connected population" as 33% lack a broadband subscription; whereas, 47% of those living on tribal lands lack internet availability (Shelton & Siefer, 2020).

In addition to internet availability and affordability, having the appropriate computer equipment is also requisite for one to enjoy the full range of technological capabilities. Kling (2007) called attention to the necessity of having suitable equipment, which includes capable hardware and software that can support the programs needed for specific activities. Having such equipment is necessary for the full application of the

internet and its sophisticated content (DiMaggio & Hargittai, 2001). A lack of access to suitable hardware and software presents barriers to the full utilization of internet services and the online resources and programs available. Inferior devices diminish the advantages people can obtain from Internet access both directly and indirectly. Slow connections and outdated hardware and software will not have the capability to access the many different sites. This leads to a less satisfying Internet experience, causing people to use the Internet less often thus acquiring fewer skills and enjoying the full benefits that Internet access can provide (DiMaggio & Hargittai, 2001). Therefore, without the proper devices and programs, which can be expensive, many individuals cannot utilize the full-range of Internet services even if they have access to it.

Digital Divide: Level Two

The second level of the digital divide, described by DiMaggio and Hargittai (2001), pertains to the inequities among users regarding four main elements: user autonomy, ability, community support, and the variety of ways for which the technology is utilized. User autonomy deals with an individual's access to devices and the Internet. The autonomy with which users can access the Internet correlates to the benefits which can be derived (DiMaggio & Hargittai, 2001). Ability refers to the "possession of know-how" in using technologies in ways that can enhance professional, social, and educational performance (Kling, 2007, p. 215). There are several important skills needed for successful and optimal internet use, including, but not limited to: knowing how to log on, search the internet, and download documents; knowing how to conduct narrowed and specific searches; knowing how to navigate websites effectively; and knowing the technical components, such as software, hardware, and how to troubleshoot problems that

inevitably arise (DiMaggio & Hargittai, 2001). Community support refers to the social inclusivity of being connected to the Internet and the availability of help and resources in users' development of "digital competence" (DiMaggio & Hargittai, 2001, p. 14). Finally, the ways in which technology is utilized refers to an individual's employment of technology for the purposes of "economic productivity… [gaining] political or social capital...consumption of entertainment" (DiMaggio & Hargittai, 2001, p. 14). Similar to access, there are vast inequities in these elements among people of color, those with limited education, and individuals from low-SES backgrounds when compared to their more advantaged peers.

Digital Divide: Level Three

The third level of the digital divide relates to the benefits associated with Internet use and is an extension of the first two levels (Scheerder et al., 2017; Lutz, 2019). Van Deursen and Helsper (2015) define the third-level digital divide as "relate[d] to gaps in individuals' capacity to translate their internet access and use into favorable offline outcomes" (p. 30). Such outcomes may include tangible benefits, such as saving money, learning information to improve health, or improving relationships through increased contact with family and friends (Blank & Lutz, 2018; van Deursen & Helsper, 2015). Thus far, third-level digital divide research has focused on links between preexisting conditions, such as "demographic characteristics, technology attitudes, skills, and differentiated Internet uses" and the outcomes - benefits or disadvantages - of these conditions (van Deursen et al., 2017). As with the other two levels, privileged individuals, who have consistent access and who are skilled users, are able to realize greater benefits from Internet use which serve to strengthen their social position,

amplifying existing social inequities (van Dijk, 2005). On the other hand, less-privileged individuals may be without access and/or the skills to maximize the benefits offered by technology and Internet use.

Level Three Digital Divide and Education. Computer self-efficacy (CSE) is an important factor representing the digital capability and outcome divide among individuals from diverse backgrounds (Dewan & Riggins, 2005). CSE is defined as an individual's judgment of his/her capability to use a computer effectively and with ease (Marakas et al., 1998). Marakas et al. (1998) provides a contrast between general and task-specific CSE. General CSE "refers to an individual's judgment of efficacy across multiple computer application domains" whereas task-specific CSE "refers to an individual's perception of efficacy in performing specific computer-related tasks" (p. 128-129). However, Agarwal et al. (2000) notes that there is actually a much stronger correlation between these two types of CSE and their relationship to future benefits. This is especially true in educational contexts among school students. As most learning outcomes require the mastery of task-specific skills (i.e. saving and retrieving documents, organizing files, and managing e-mail), it has been found that general CSE affects learning outcomes in both educational and organizational settings (Compeau & Higgins, 1995; Webster & Martocchio, 1995). Thus, CSE has become the main "construct through which personal, behavioral, and environmental factors influence outcomes" (Wei et al., 2011, p. 173).

Educational institutions play a considerable role in furnishing equal opportunities for students' CSE development and future outcome benefits through their use of IT resources. Indeed, Wei et al. (2011) confirms that developing knowledge and skills is the

key to achieving learning outcomes in both "education and information systems studies" (p. 173). Learning outcomes can include building generic skills, such as vocabulary, or specific skills, such as understanding how to read the periodic table (Wei et al., 2011). Hooper-Greenhill (2004) describes five generic learning outcomes, including "an increase in knowledge and understanding; an increase in skills; a change in attitude or values; enjoyment, inspiration, creativity; [and] action, behavior, progression" (p. 154). CSE has had positive effects on students' learning outcomes, specifically knowledge and skills outcomes, when students have access to a rigorous learning environment that focuses on knowledge creation and IT skill development (Marakas et al., 1998). Likewise, CSE plays a significant role in generating learning outcomes when students are adequately prepared to explore the Internet and proficiently use a variety of technologies (Wei et al., 2011). Therefore, a school's technology infrastructure determines the effectiveness of IT-based learning and improving the IT proficiency of students (Mann et al., 1999). The infrastructure, which determines a school's ability to provide effective CSE development for students, must include "availability of IT resources, quality of IT training, and [a school-wide] IT culture." With such resources, "guided mastery" and "high-quality training" will contribute to students overall competency and higher CSE, leading to greater future benefits (Wei et al., 2011, p. 175-176).

Digital Literacy

Learning digital literacy skills has many implications for students and their futures. Digital literacy has been shown to improve students' motivation, ability to self-regulate, and overall academic performance (Adobe, 2017; Porata, Blaub, & Barack, 2018). Ala-Mutka (2011) and Esket-Alkalai (2012) explained that proficiency in digital

literacies is a critical element for survival in the current digital and knowledge society. Digital literacy encompasses more than just the possession of adequate technical abilities (i.e. operating digital devices, understanding digital tools, and surfing the Net), rather it consists of a specific range of knowledge, abilities, and attitudes needed to adequately function in a broad digital environment (Ferrari, 2012).

Digital literacy involves complex analytic abilities, which involve cognitive, motor, and socio-emotional skill sets (Eshet-Alkalai, 2012). Such skills enable users to operate instinctually and proficiently in the digital environments they will engage as part of their continued learning, career, and daily operations (Hague & Payton, 2010; Mohammadyari & Singh, 2015). As previously mentioned, digital literacy includes the ability to find, evaluate, and communicate information successfully with others original and to create personal content to express oneself in ways which foster and promote one's personal and professional goals (Iordache, et al., 2017). Learning, building, and improving digital literacy skills in order to realize their many benefits as well as to simply survive in our digital society requires direct instruction within a comprehensive digital literacy curriculum. Educational institutions that provide such instruction engender capable, digitally-wise citizens who are able to contribute and compete in society.

Inequities in Digital Literacy Instruction

DiMaggio and Hargittai (2001) posit that education will be a "strong predictor" of individuals learning the skills necessary to use technology and the Internet for personal, professional, and social improvement (p. 15). Unfortunately, however, much research has exposed vast inequities in the use of technology in schools for low-SES students where teachers report fewer digital resources causing greater barriers to digital education

(Tierney & Kolluri, 2018; Purcell et al., 2013). For instance, in districts with a population of students from low-SES backgrounds, technology is used mainly for skill reinforcement; whereas, in districts with a population of students who come from economically advantaged households, technology is used for research, high-level analysis and for synthesis (Becker, 2000; Warschauer et al., 2004). Computers are also often used as a reward for advanced students (Schofield & Davidson, 2004). Additionally, Wenglinsky (1998) and Warschauer (2000) found that there was an over-emphasis on technology-based remedial or vocational training for students from low-SES backgrounds as well as Black, and Hispanic students while high-level academic uses of technology were utilized by students from high-SES backgrounds and white and Asian students. The inequities in the use of technology for education actually widen the digital divide between students of color and students from low-SES backgrounds and their white or more advantaged peers.

Teachers and Digital Literacy

The preparation and ongoing professional development of teachers is an important factor in their readiness to successfully integrate technology in their classrooms. Unfortunately, there are few pre-service programs that fully prepare teachers for the challenges of implementing technology into their instruction (Spaulding, 2013; Herald, 2017). Oftentimes, teachers must pursue additional certifications in order to have the requisite skills for effective technology implementation. Likewise, it has been hard to determine the effectiveness of professional development, especially when it is most often geared towards training teachers to use specific hardware or software programs being added to the curriculum (Lawless & Pellegrino, 2007; Herald, 2017). Some teachers are

also very slow in adapting to technology, preferring instead to teach in ways that are most comfortable for them rather than learning something entirely different and new (Reinhart et al., 2011).

Other barriers to digital literacy include physical or digital factors, including the physical school building, allotted time within the school day, and faulty or inadequate technology (Reinhart et al., 2011). This is especially true in schools located in urban or settings with a high concentration of low-SES residents. Teachers in low-income districts simply do not have the technological infrastructure, including up-to-date technology, facilitators, and training to adequately implement technology for higher-level learning (Reinhart et al., 2011). Therefore, disadvantaged students are not acquiring the skills needed to maximize their learning through technology to the extent their more advantaged peers may be able to do so.

Contrarily, teachers in districts located in privileged communities have much greater access to the technology, support, and the training needed to effectively integrate technology into the learning environment (Herold, 2017). Yet, even when schools do have the technology resources and a qualified staff, oftentimes technology is underutilized, used only as a tool to enhance traditional teaching practices. Indeed there are even many misuses of technology that teachers mistake for infusion of digital literacy. Such practices include, teaching with PowerPoints, giving students assignments to simply create a digital presentation, asking questions that can easily, penalizing students for using "digitalk" in their formal writing, and utilizing innovative technology features that generate data without using the data to inform instruction (Hicks & Turner, 2013, pp. 60-61). Instead what students need are opportunities to use technology to solve complex

problems, to co-create or communicate information with others, to persevere and utilize resources when they hit setbacks, and "to use technology in ways that are truly digital" (Hicks & Turner, 2013, p. 59).

Digital Literacy and Social Reproduction

However, when schools do not have the means to provide adequate digital literacy instruction, students leave unprepared and face the consequences of their insufficient and unequal education. Thus, digital literacy education contributes to the continued social reproduction and the "perpetuation of a class society" (MacLeod, 2018). Social reproduction is the process by which the socio-economic classes in a class-based society tend to reproduce their generational status (i.e. from parents to their children) and the way various societal institutions, such as education, contribute to such replication (Clark & Carter, 2012). Social reproduction theorists often focus on schools "as a site that facilitates much of the intergenerational transmission of either privilege or disadvantage, depending on the class or group" (Clark & Carter, 2012, p. 2012). Structuralist theorists posit that social reproduction occurs in educational institutions in terms of the disadvantages, such as limited resources, undereducated parents, low teacher quality, and the socialization of such students, faced by economically disadvantaged students as well as many racial and ethnic minority students. Furthermore, structuralists assert that the education provided to students from low-SES backgrounds is often different than that of students from middle-and-upper-SES backgrounds; this can occur within or between school districts. They believe that the more advantaged students are taught higher-level skills that will lead to more prestigious professional careers, whereas underprivileged students are taught low-level knowledge, preparing them for lower-paying professions

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(Clark & Carter, 2012). Therefore, it stands to reason that students who receive a thorough digital literacy education will be prepared for higher-paying careers and social advancement while students who do not receive such an education are denied such opportunities.

A Transition to Virtual Learning

Increasingly, and despite the challenges noted above, schools are relying on digital technology for instructional purposes. In fact, there has been tremendous growth in the adoption of education technology, resulting in worldwide edtech spending reaching $18.66 billion in 2019 with a market projection for online education estimated at $350 Billion by 2025 (Li & Lalani, 2020). There is a widespread belief that effective technology use can improve and enhance student learning (Polly, et al., 2010). To that end, many schools have started using apps, such as Google Apps for Education, as well as countless other online learning platforms to enhance the teaching and learning in all content areas in K-12 classrooms (Singer, 2017; Evergreen Education Group, 2017). The Internet, as well as online databases, are used for research in order to communicate ideas, write essays, or solve problems. Using these resources, students learn how to conduct searches to find the information they are seeking as well as how to determine if sources are credible (O'hanlon, 2013). Additionally, such practices as flipped classroom or flipped learning offer alternative, yet engaging ways to teach new content. Flipped learning is a method in which teachers pre-record lectures that are then assigned as homework for students to watch, leaving class time open for activities that allow students to apply what they have learned (Iinuma, 2016). Technology can also allow students to collaborate on cooperative learning projects. Platforms, such as Google Drive, allow

students to create and share documents, spreadsheets, and presentations with their partners, allowing each partner to contribute to and comment on the shared assignment (Awuah, 2015). These are only a few examples of the many ways in which technology has found its way into education. Understanding digital technologies and increasing digital literacy is also part of the 21st Century learning objectives. In fact, Blair (2012) explains that today's "students need access to a constantly evolving array of technological tools and activities that demand problem-solving, decision-making, teamwork, and innovation" (para 6). Therefore, technology and virtual learning will continue to have a significant role to play in education.

Virtual Learning in New Jersey

In 2020, the COVID-19 crisis required that schools hasten the construction of virtual learning environments across the United States. In New Jersey, for example, schools were forced to close their doors to traditional, face-to-face instruction (NBC10 Staff, 2020). School districts serving students in grades K-12 responded to the pandemic in a multitude of ways based primarily on: where the schools were located; the structure and organization of the school; available financial funds; socioeconomics; and the needs of the community (Brooks et al., 2020; Reich et al. 2020). The sudden and unexpected change to the educational environment (and society) changed the work of teachers and the expectations of students in many ways (Fagell, 2020; Laster Pirtle, 2020). School buildings were closed in a matter of days and teaching and learning transitioned to an online environment – an environment that continues to infiltrate the educational context in many ways. Whether we call it remote instruction, hybrid instruction, virtual learning or distance education, teachers were called upon to provide vigorous and meaningful

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learning experiences to all of their students (De Witt, 2020; Merrill, 2020). At the same time, school principals and district leaders scrambled to help students establish connections to the internet, found ways to provide computers for those without device access at home, and guarantee food service for families who depend on free and reduced school meals.

Schools were faced with many new challenges in educating students. With the advent of remote and hybrid models of instruction, teachers and students have been forced to quickly adapt to a virtual mode of teaching and learning. Synchronous and Asynchronous pedagogy have become the new norm in education. Not only are teachers required to teach the curriculum, they must also guide students in using new technologies, help students to navigate the plethora of connectivity issues, and engage students through a virtual learning environment. Navigating technical issues is particularly challenging due to the fact that many students are using different devices, different internet services providers, and remote hotspots (Shakya et al., 2020). These issues are further complicated by the ever-present and growing digital divide. Many students simply do not have consistent access to devices or reliable internet service. In a recent survey, approximately one-in-five parents explained that children were not able to complete homework due to the lack of a computer in the home or will have to use public Wi-Fi due to inconsistent internet access. Another 29% stated that their children would have to complete assignments using a cell phone (Vogels et al., 2020). Compounding this issue still further is the uneven digital literacy education low-SES students receive compared to middle-and high-SES students, leaving them unprepared to navigate virtual learning and the plethora of new digital platforms being introduced.

Remote, or distance, learning and instruction are not new concepts in education; in fact, colleges have been providing remote learning for decades (tele-courses, online classes). Likewise, there are many K-12 online schools, such as Pearson Online Academy and the Keystone School. However, this platform was new to many K-12 educators, causing the role of the teacher to change. Limited to working from home, armed with lesson plans designed for classroom instruction but inadequate for the remote setting, confronted with new technologies, and separated from their students, teachers were faced with one of the most traumatic events in modern education (Baired, 2020). Perhaps equally as traumatic for students, as they are now expected to cope with remote instruction, learning how to navigate new online platforms, while also continuing to develop new skills as part of the curriculum. Students often struggled at home with social isolation and loneliness from being separated from their friends and teachers while high school seniors missed out on important milestones, such as their senior trip, prom, and in many cases, a traditional graduation. Additionally, changes to the learning environment will likely have detrimental effects on the learning gap between children from low-SES and higher-SES families; whereas, the modification of the curriculum and lowered performance expectations have caused gaps in most students' learning, motivation, and engagement (Fagell, 2020; Gewertz, 2020).

During the pandemic and the ensuing school closures, we learned how unprepared our students (and teachers) were to handle the transition to a remote, digital learning platform. It became clear that students did not possess the digital literacy skills necessary to both navigate a digital learning environment and continue to learn the curricular content using online platforms (Richards, 2020). Moreover, our students did not possess

the needed self-regulation behaviors to plan (setting goals, prioritizing), monitoring goal completion (problem-solving, course correcting, and reflecting (metacognition) (Ackerman, 2020). Additionally, students are struggling with the lack of social and emotional support that have grown accustomed to receiving from their teachers and their peers (Richards, 2020).

These issues lend to a crisis in education; an experience that is causing students to disengage from learning and teachers to lower expectations and reduce academic rigor (Marshall et al., 2020). However, there was a unique opportunity to use the crisis to both change the way teachers instruct their students using technology and the way students learn and engage with instructional materials using multiple digital tools and platforms, especially since many districts foresee remote learning continuing as part of the education offered to students (Superville, 2020). In fact, according to a Rand survey (2020) school and district leaders are preparing to seek additional state and federal aid to improve technology, expanding internet access, hiring qualified teaching staff, updating their instructional systems for online instruction in both academics and SEL, and developing targeted professional development for teachers, specifically Special Education teachers and those working with English language learners (ELL) (Schwartz, et al., 2020). Online learning, in some form or another, is going to continue to be a regular part of students' academic experience.

In order to prepare students to be successful with online learning, teachers must teach them to be self-directed learners. Students who are self-directed possess the self-regulation strategies required for self-directed learning, planning, goal setting, and problem-solving to resolve challenges that arise. They know how to recognize when

short-term and long-term goals have been met and they can manage their time effectively to ensure tasks are completed in a timely manner (Spencer, 2021). Teaching students to be self-directed learners in a virtual learning environment requires strategies that prepare students for the rigors of the curriculum as well as navigating the virtual platforms and tools needed for success (Spencer, 2021). Educircles.org (2020), a source dedicated to helping teachers prepare their students to be independent learners, recommends several strategies that foster a growth mindset and help students manage their learning in the remote environment. These strategies include: avoiding distractions through time management; removing outside diversions that hinder learning and progress; overcoming obstacles; and learning from mistakes to improve future performance (Educircles.org, 2020). Once students develop the mindset and the strategies to be self-directed learners, they will find success in the virtual learning environment.

Growth Mindset

Instructional practices that promote a growth mindset have become an integral part of teaching and learning, especially in the online environment. Growth mindset is the belief that intelligence is malleable and can be improved (Dweck, 2012). This idea diverges from the belief that intelligence is fixed and unchangeable (Dweck, 2017). In fact, this latter belief is one that many of us were taught from a young age; a belief that is still pervasive. The idea that some people were considered "gifted" or "talented" while others were destined to remain inferior is still a widely held conception - especially among those considered "gifted." The problem with such a fixed mindset is the limitations it puts on the individuals who hold it. Challenging tasks are avoided because effort calls one's "natural" abilities into question (Dweck, 2017). Therefore, individuals

with a fixed mindset often have a fear of failure. On the other hand, those with a growth

mindset embrace failure. For those individuals, failure does not define them, but is

viewed as a way to learn and grow. Facing challenges, working hard, and putting forth

effort is where learning takes place. In fact, embracing a growth mindset predicts

improved academic performance and achievement, particularly among students who face

challenges (Haimovitz & Dweck, 2017). For these reasons, among others, growth

mindset practices have been adopted by educators in order to improve student learning

and achievement.

Possessing a growth mindset, especially when facing adversity, such as the

transition to remote instruction, is critical. For many students, learning virtually and

remotely is something they have never experienced before, so failure is inevitable. Using

growth mindset practices, however, reinforce the idea that failure is the pathway to

growth. It is also a way to encourage students to keep trying when they do not initially

succeed by providing meaningful feedback and encouraging effort. Likewise, it is

important to encourage students to take academic risks and to try new and challenging

things. In the world of virtual learning, everything is new and challenging; therefore,

growth mindset practices are ideal in fostering student success. Teachers who embrace a

growth mindset use specific practices to foster a growth mindset in their students. These

practices include: teaching for understanding and mastery; providing direct and

constructive feedback to foster understanding; allowing students an opportunity to revise

their work in order to improve their understanding; relaying messages regarding effort,

hard work, and failure as part of the learning process; and providing scaffolded

instruction and intervention that promote a collaborative relationship between students and teachers throughout the learning process (Haimovitz & Dweck, 2017).

Even short-lived, mindset training approaches have had a positive effect on students' beliefs about their ability to improve their intelligence and academic performance (Brougham & Kashubeck-West, 2018). Indeed to truly foster a growth mindset among students, classroom practices and growth mindset training must be part of a school-wide initiative and supported by school leaders in order to see sustained improvement in student achievement (Haimovitz & Dweck, 2017; Brougham & Kashubeck-West, 2018). Moreover, fostering a growth mindset among students will provide them with the tools they need, such as motivation and persistence, to build necessary digital literacy skills while navigating virtual learning. Therefore, the sudden and persistent alteration to the learning environment begs the question: How have teachers' instructional practices that promote a growth mindset among their students evolved to accommodate the demands of the remote learning environment?

Problem Statement

Technology is used in education, in every career field, and even in socializing. In fact, approximately 4.57 billion people around the world, or 59% of the world's population, use the internet (Kemp, 2020). This means, however, that 41% of the world's population does not use the internet; in some reports, the total is as high as 46% (Brown, 2020). Although there are undoubtedly many reasons for this lack of global connectivity, one reason can certainly be attributed to access (Brown, 2020). Access to the internet facilitates human rights. Benefits, such as, reducing poverty, providing educational opportunities, access to specific information, ease of communication, and greater

participation in the global community are what the citizens around the world deserve (Thelwell, 2019). The lack of global internet access does not only affect non-industrialized countries, but developing countries as well, including the U.S.

Unfortunately, there is an ever-present digital divide as it relates to accessing reliable technology devices, Internet connectivity, and digital literacy instruction among disadvantaged students and their more advantaged peers. Many students do not have computers, laptops, or tablets at home with which they can complete homework assignments, conduct research, or, relevant to current teaching practices, log-in to virtual meetings to participate in remote learning (Vogels et al., 2020). Additionally, even when students do have devices, whether their own or provided by their school, not every home is equipped with adequate Internet access to support the online learning activities in which students are expected to engage. In fact, some students are simply unable to complete school work because the needed technology is just not available (Vogels et al., 2020). The issues related to access disproportionately affect Black students, Hispanic students, students from low-SES backgrounds, and students who live in rural areas (Duffy & Tappe, 2020). Inherent in this lack of access is the perpetuation of inadequate instruction and unequal educational opportunities available to underprivileged students.

Access to digital resources is only one component of the digital divide; knowing how to effectively use those resources is another, perhaps more critical component of the digital divide. For students to be "digitally literate," they must possess "the ability to make and share meaning in different modes and formats; to create, collaborate and communicate effectively and to understand how and when digital technologies can best be used to support these processes" (Hague & Payton, 2010, p. 2). Digital literacy

instruction in schools is very diverse and relies heavily on a solid technology

infrastructure that facilitates professional development, on-going coaching, and support

by a well-trained, certified staff. Schools located in districts with adequate financial

resources, the ability to purchase quality technology devices, and the capacity to provide

reliable broadband access can create and implement a digital literacy curriculum that

includes using technology for research, problem solving, and activities requiring higher-

order thinking skills. However, schools located in under-funded districts, attended

primarily by students of color and students from low-SES backgrounds, do not have the

necessary resources and cannot provide the same level of digital literacy instruction. The

digital instruction in these schools, when it is available, is most often limited to

remediation or drill and practice of basic skills (Wenglinsky, 1998; Warschauer, 2000).

These schools lack the foundation and the knowledgeable staff to provide an adequate

digital literacy program thus contributing to the inequities in digital education.

Despite the existence of these factors which perpetuate the digital divide,

educators have a unique opportunity to increase and improve digital literacy. Remote

instruction and virtual learning are the new norm: one that is unlikely to change even as

the pandemic subsides. This paradigm shift in teaching and learning will likely have

caused public education to change in ways that remain to be seen (Van Lancker &

Parolin, 2020) The facilitation of remote instruction has opened up possibilities that may

allow districts to eliminate the need for school closures due to inclement weather, to

change attendance policies, and even to open up additional summer learning

opportunities. These are just a few examples of the possibilities of virtual learning.

Although educators are still a long way from being able to capitalize on all of these

possibilities, there exists a need to begin the transition. Educators are presently engaging

students in remote learning, and it continues to present a multitude of challenges.

Teachers and students do not currently have access to the same consistent and reliable

technology, nor the same levels of digital literacy. Such obstacles to learning require

specific instructional approaches that help prepare students for civic engagement in the

21st Century. Educators need an approach that will both motivate them to rise to the

challenge - one that will enable them to engage and motivate their students to learn more

and to improve. Using instructional practices that promote a growth mindset among

students has the potential to improve students' motivation and increase students' digital

literacy, thereby improving learning in the virtual educational setting (Kazakoff &

Mitchell, 2019).

Purpose of the Study

The purpose of this explanatory sequential mixed methods study was to explore

the ways in which high school teachers use instructional practices that promote a growth

mindset among their students, how those practices are used to improve digital literacy,

and how these practices evolved during the transition from face-to-face instruction to

remote instruction. While this may appear to be a relatively benign transition, the digital

divide which exists between students from low-SES backgrounds and their more

advantaged peers, creates uneven access to quality education. From inconsistent access to

devices and the Internet to a significant lack of digital literacy skills among students,

remote instruction presented new challenges for teachers and students. Therefore, this

study aimed to explore not only how teachers are using instructional strategies to promote

growth mindset, but how those strategies are helping to improve students' digital literacy in order to narrow the digital divide.

Research Questions

1. How many high school teachers, who responded to the survey, promote a growth mindset in their learning environment?

2. How many high school teachers, who responded to the survey, incorporate digital literacy instruction in their instructional practices?

3. What instructional practices are being implemented by high school teachers to promote a growth mindset among their students?

    a. How are teachers' using instructional practices that promote growth mindset to improve students' digital literacy?

    b. How are growth mindset practices used to promote digital literacy in high schools located in privileged school districts different from those used to promote digital literacy in disadvantaged school districts?

4. How have high school teachers' instructional practices that promote a growth mindset among their students evolved to accommodate the remote learning environment?

    a. How have high school teachers used the transition to a remote learning environment to change their instructional practices in order to address students' digital literacy needs?

Definition of Terms

The following terms are defined below and will be used for the purpose of this study.

Growth Mindset: The belief that an individual's most basic abilities can be developed through dedication and hard work (Dweck, 2015).

*Remote Instruction***:** A method for teaching and learning when students and instructors are not physically present in a traditional setting such as a classroom (College of the Canyons, 2021)

Synchronous Instruction: A term used to describe instruction, and learning that occur in real time, but not in a separate location. The term includes multiple forms of televisual, digital, and remote learning in which students receive live instruction from teachers, but at a distance (NYU, 2021).

Asynchronous Instruction: A term used to describe instruction and learning that do not occur in real time or in the same location. The term includes multiple forms of digital and remote learning in which students learn content in the form of prerecorded video lessons or learning tasks that students complete independently. Asynchronous learning also refers to other forms of instructional interactions, such as email exchanges, discussion boards, and course-management systems that organize instructional materials and correspondence (NYU, 2021).

Digital Divide: The digital divide is the gap that exists between individuals who have access to modern information and communication technology and those who lack access (Steele, 2019). There are three levels of the digital divide: access, ability, and benefits.

Digital Literacy: Digital literacy is the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills. (American Library Association)

Study Framework

The practice of teaching requires one to connect with all students; to motivate students and help them develop an interest in learning; to commit to helping all students learn; and to develop and implement effective lessons and engaging learning experiences (Enz, et al., 2007; Cruickshank, et al., 2003; Bettencourt, et al., 1983; Borich, 2004). To that end, teachers must establish a learning environment which fosters students' enthusiasm and love for learning. They create classroom communities in which students feel safe and respected; that are guided by clear expectations, routines, and procedures; and that embraces and accepts each student as an individual (Enz et al., 2007; Noddings, 1984). They must plan lessons that demonstrate knowledge of their students (differentiated instruction), of the content, of the materials they use (technology), of effective lesson delivery, and of appropriate forms (formative and summative) of assessment (Enz et al., 2007). Teachers must engage students in a wide range of activities that require students to be actively engaged and to act as partners in their own learning process (Enz et al., 2007). They must balance lecture, or disseminating information, with active learning strategies that allow students to apply what they have learned to new or real-world situations. Such strategies include problem-based learning, cooperative groups, investigative research, experiments, and project-based learning (Enz et al., 2007). Of course, teachers must also be able to recognize which strategies are appropriate for each lesson - and each group of students.

With the emergence of remote instruction as a result of the Covid-19 pandemic and the closing of school buildings, teachers were compelled to adapt their instructional practices and incorporate new, virtual instructional platforms (Fagell, 2020; International

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Task Force on Teachers for Education, 2020; Reimers & Schleicher, 2020). They were

required to come up with creative ways to teach students the curriculum (Schwartz,

2020). They had to learn how to teach to students in the physical classroom while

simultaneously teaching to students in a remote setting (Reimers & Schleicher, 2020;

Lieberman, 2020b). They had to create and adapt lessons and activities that were both

challenging and engaging to students, and that meet the needs of the changed learning

environment (De Witt, 2020; Merrill, 2020). Overall, teachers were creative in adapting

their instructional practices while keeping students motivated and engaged (Schwartz,

2020). All the while, teachers had to become technologically proficient in order to help

their students navigate connectivity issues and the technical problems they encountered

negotiating the various new learning platforms (Bushweller, 2020). In conjunction with

the technical issues, simply learning remotely was difficult for many students.

Recognizing this challenge, teachers used this opportunity to help their students improve

their digital literacy skills (Buchholz, et al., 2020). Research on digital literacy

emphasizes "the skills and practices students use to navigate, curate, produce, and

consume digital media" (Nichols et al., 2020, p. 107). Specifically, digital literacy

focuses on how students use digital technologies to find, analyze, and communicate

information. Virtual instruction opened the door for teachers to teach their students how

to explore their digital resources to find information, solve problems, and collaborate

with their peers (Buchholz, et al., 2020; O'Brien & Scharber, 2008). Notwithstanding this

potential, the transition to remote learning and the possibility of continued remote

learning in the future, uncovered a need for continued, focused attention, intervention and

instruction of digital literacy skills.

As teachers approach teaching and learning, whether in a traditional or remote learning environment, implementing a growth mindset as part of their everyday practice and instructional strategies can enhance student learning and achievement by improving students' resilience, especially in the face of challenges and setbacks (Dweck, 2017; Blackwell, et al., 2007). Growth mindset is the belief that intelligence is malleable, not fixed, and asserts that through learning, effort, and hard work students can develop their intellectual ability (Dweck, 2007; Dweck, 2017). Growth mindset functions as an implicit theory of intelligence (ITI). Implicit theories, or self-theories, refer to an individual's view about their inherent nature, (i.e. intelligence or personality) and their beliefs about their ability to improve their intelligence and abilities (Dweck, 2000). Teachers' implicit theories of intelligence have been shown to have an effect on student learning and achievement. In fact, Seaton (2018) found that "differing mindsets, or assumptions, that teachers possess about themselves and their students play a significant role in determining their expectations, teaching practices, and how students perceive their own mindset" (p. 43). ITI was used as a framework to guide this study and was explored in greater detail in Chapter 2.

Limitations and Delimitations

All research studies, no excepting this one, have certain delimitations and limitations. The following addresses how the definition of terms, the scope, the methodology, and the role of the researcher, all impacted the study and suggests solutions to allay these challenges.

Terms

Although related, remote instruction and virtual learning are not exactly
synonymous; however, the terms are often used interchangeably by practitioners who can
create confusion especially as it relates to instructional delivery and the relative location
of teachers and students. Virtual learning is any learning that takes place using a digital
device, and most often, the Internet in the form of an online platform or course-
management system. Remote instruction, as noted in the definition above, happens when
the teacher and the students are in two separate locations. However, remote instruction
also includes a hybrid model of instruction. Hybrid models can also have two distinct
meanings: (1) an alternating mix of in-person and remote instruction and (2) teaching to a
classroom of students while simultaneously teaching to students who are learning
remotely. Additionally, learning in all of these formats can occur synchronously or
asynchronously. Thus, virtual learning is an umbrella term which captures the types of
remote instruction.

This can create challenges for researchers, especially using survey research, when
attempting to answer the same general research questions. Survey respondents may
misinterpret the use of certain terms, viewed as synonymous, and answer questions based
on inaccurate understanding of the terms used in the question thus skewing the data
(Smyth, 2016). Likewise, when using survey data to inform the choice of respondents to
interview, such choices can be misinformed based on the survey responses. Therefore, it
will be essential, during the interview process to ensure participants understand the
definition of terms being used for the study (Guest et al., 2013). It may also be necessary

to provide a definition of terms on the survey to ensure respondents provide the most accurate responses (Smyth, 2016).

Scope and External Validity

The scope of the research is limited to New Jersey. Moreover, the sample of school districts, from which survey participants were chosen, was based primarily on the socioeconomic factors of the area in which they were located. The scope was further limited in my decisions regarding which teachers would be chosen for the interview process. Such decisions could affect the external validity of the data collected in the study. More specifically, external validity threats can occur when the researcher attempts to draw analogies or generalizes about populations not studied or settings not examined (Creswell & Creswell, 2018). One way to resolve such threats to validity is to reference only those who have similar characteristics to those studied in the experiment and to avoid generalizations about those who do not have those characteristics (Creswell & Creswell, 2018). Since my study is focused primarily on teachers' practices in multiple educational settings, the characteristics of the teachers in the study and their instructional practices can be generalized to include other teachers who may possess or can adopt those characteristics and teaching practices. Likewise, since the central problem of this study is the digital divide, which is a national concern (United States Census Bureau, 2018; Pew Research Center, 2019), the approaches of teachers in this study to improve digital literacy and narrow the digital divide can be generalized to other teachers' approaches throughout the U.S.

Methodology

For this research, I chose an explanatory sequential mixed methods design. This design uses qualitative data to further explore quantitative data (Creswell & Plano Clark, 2018). Both quantitative data and qualitative data have unique limitations; therefore, using a mixed methods design helps to offset the limitation of collecting only one kind of data (Creswell & Plano Clark, 2018). However, there are limitations to a mixed methods design as well. Specifically, there is a need to identify two different samples for the quantitative and qualitative data collection, so generalizations between the two sets of data, or using the second of data to explain the first, becomes more complex. Creswell and Plano Clark (2018) suggest using a purposeful sample in the quantitative phase and then using a large sample of varying participants in the second phase to enhance generalizations of the quantitative results. Therefore, I have chosen to use a case-selection variant. I will use the quantitative data to identify participants for the qualitative phase.

The Role of the Researcher

As a proponent of growth mindset, I have an inherent bias towards its use in instruction. Therefore, I must continue to remain reflexive throughout the research process in order to remain open and honest about my intrinsic partiality. Two ways I can work to avoid these biases is in creating the survey questions and interview questions. I will have to pay careful attention to the order in which I pose questions to participants and avoid questions that will lead participants to a certain answer (Sarniack, 2015). When designing my survey, I will conduct a pilot test in order to garner feedback about the quality of the survey and to rule out any potential bias (Fink, 2017). Likewise, when

interviewing, I can ask participants to share personal examples of experiences related to the questions. I can also allow them to review the transcripts to ensure accuracy (Rubin & Rubin, 2012).

Significance

This study addressed many important issues in education as well as possible solutions to those issues. This study addressed the persistent and growing digital divide that affects the ability of students from low-SES backgrounds to access the same level of education available to their more advantaged peers. The three levels of the digital divide - access to adequate and reliable technology, possessing sufficient skills to unleash the full potential of technology, and the benefits of technology - were explored and explained. As a result of both the quantitative and qualitative data, a fourth level of the digital divide was uncovered which involves students' abilities to learn virtually. Although much of the research demonstrated that many students, regardless of background and ability, struggled with virtual learning, it became clear that students from low-SES backgrounds, students who attend schools in underfunded districts, special education students, and ELL students struggled significantly more than many of their counterparts who were not affected by these factors. Both the quantitative and qualitative data allowed a comparison of the digital literacy instruction offered to students attending schools in districts serving low- middle- and upper-SES students in order to uncover the inconsistencies in digital literacy instruction, teachers' level of proficiency to provide digital literacy instruction, and districts' abilities to provide the resources necessary for digital literacy instruction.

Research

      This study provides insight into teachers' classroom practices that promote a growth mindset amongst their students. More specifically, this study highlighted how those practices have evolved with the advent of remote instruction as well as how those practices were used to address and improve students' digital literacy skills to improve virtual learning. The findings from this study benefits researchers by laying the groundwork for future studies involving the use and effectiveness of focused growth mindset practices as a part of digital literacy instruction. Moreover, as effective digital literacy instruction is a pathway to narrowing the digital divide, future research might involve an action research study that creates a digital literacy program using growth mindset practices in schools serving low-socioeconomic students. Finally, understanding that there is a wide array of digital literacy skills among teachers, future research could focus on professional development that uses Growth Mindset practices to improve teachers' digital literacy and their ability to apply those skills in their instructional practices.

Policy

      This study may encourage new policy regarding the digital literacy curriculum being offered to students in high schools throughout New Jersey. A digital literacy curriculum must be part of all the content areas as the use of technology becomes more ubiquitous in every field of study. It is especially important to focus on ways to improve virtual instruction as schools continue to offer various models of remote learning. Likewise, it is important to have policies that focus on improving teachers' expertise with technology infusion into their teaching and learning, in general, and how their practices

can be applied to remote instruction. Additionally, it is necessary to provide adequate

resources, such as professional development, to teachers in order to prepare them for the

rigors of digital literacy instruction.

Practice

Finally, this study highlights the importance of implementing instructional

practices that promote growth mindset among students in digital literacy instruction as

well as in improving virtual learning. Many teachers' instructional practices that promote

a growth mindset among their students have evolved as they help their students overcome

the difficult challenges presented by virtual learning. When teachers engage students

using growth mindset practices, such as providing feedback, encouraging focused effort,

working through failures, and challenging them appropriately, students will learn to take

academic risks and share in the responsibility for their own learning. Because of the

complexities inherent in digital literacy instruction and the complex and challenging

ways in which students can employ technology, growth mindset practices offer students

the support they need to learn new skills and succeed in new ways. In addition to

highlighting the ways in which teachers have adapted their teaching practices that

promote growth mindset to support students during remote learning, this research has the

potential to highlight the significant benefits of using growth mindset practices to teach

digital literacy skills in order to narrow the digital divide.

Overview of Dissertation

This dissertation was organized into six chapters. Chapter one situates the current

study within the larger context of the digital divide and secondary education. Chapter two

provides an abridged synopsis of the relevant literature reviewed in the study. Chapter

three provides a comprehensive discussion of the methodological framework. Chapter four discusses the findings of the research. Chapters five and six include two original manuscripts for publication.

Chapter 2

Literature Review

There exists a need to improve students' digital literacy skills in order to narrow the digital divide among students from low-SES backgrounds and their more advantaged peers. Parallel to this need, there is an equally critical need to improve *all* students' digital literacy skills in order to prepare them to learn in an ever-changing educational environment, which now includes remote instruction within a virtual learning platform (Herold, 2020) as well as to become contributing members in a technology-driven global society (Kahne et al., 2018). With the emergence of remote instruction as a result of the Covid-19 pandemic and the closing of school buildings, the digital divide has become an even greater issue perhaps having a more significant impact on students' learning than it did before (Stelitano, et al. 2020).

This literature review briefly examines some of the problems caused by the digital divide faced by students and teachers during the transition to remote instruction resulting from the Covid-19 pandemic. This review also investigates digital literacy practices in education, implicit theories of intelligence, growth mindset including the historical foundations of growth mindset, brain plasticity, current research in growth mindset with a special emphasis on growth mindset practices in high schools, and teachers' practices using growth mindset in the classroom. Finally, the literature review will conclude with an overview of the potential benefits of a growth mindset approach in digital literacy instruction.

The COVID-19 Pandemic

Since the beginning of 2020, all across the globe students have been affected by

the sudden outbreak of an infectious and deadly disease: the novel Coronavirus, Covid-19

(Jacques et al., 2020). This virus, which has affected tens of millions of people, causing

the deaths of over a million individuals, has wreaked havoc on public schools, colleges,

and universities in the U.S. and around the world (Sohrabi, et al., 2020). In March, 2020,

many public schools across the U.S. were forced to close their doors to traditional, in-

person instruction and transition, practically overnight, to a remote learning environment

as a result of the Covid-19 pandemic (Herold, 2020). While these emergency closings

were originally thought to be temporary, many schools have continued to remain closed

while others offer a combination of in-person and remote instruction (Wyse et al., 2020).

The Transition to Remote Instruction

Remote instruction is a type of instruction that occurs when students and their

teacher are not in the same physical location (i.e. a traditional classroom setting), but

instead are engaged in a model of teaching and learning virtually, using a computer and

an online platform (College of the Canyons, 2021). This type of instruction can be

synchronous, in which learning occurs in real time, or asynchronous, in which learning

does not occur in real time, but with students learning from videos or engaging in

independent activities (NYU, 2021). It is important to highlight that the type of remote

learning experience which has been implemented as a result of the pandemic is

considered "emergency remote teaching," (Hodges et al., 2020) and has been

implemented as a way to the circumstances of the current crisis (Toquero, 2020). This

type of emergency response differs from more traditional online learning environments,

which are created using a deliberate instructional design and planning and often lead to successful learning experiences (Branch & Dousay, 2015).

Therefore, an inherent problem in the transition to the remote learning platform was the lack of preparedness faced by school districts relating to the continuity of education they needed to provide (Gracia Mathewson, 2020). First, many districts faced concerns relating to students' and teachers' access to devices and the internet. For example, Will (2020) highlights a Pew Research Center report which found that "[m]ore than a quarter of U.S. homes don't have broadband internet service," and approximately "4 percent of teachers don't have high-speed wireless access at home" (p. 17). Correia (2020) explains that "[teachers] are struggling with how to attend to all their learners' needs, particularly those who do not own a computer" (p. 13). Many schools did address this concern by providing devices, such as laptops and tablets, as well as wireless hotspots to students who needed access (Herold, 2020). Where access was addressed, many districts also faced concerns over students' and teachers' abilities to navigate the plethora of new online formats (Gillis & Krull, 2020). Correia highlights that many "learners recognized that they also needed assistance to overcome technological issues…" leading the understanding that not "all learners are technologically savvy" (2020, p. 14).

Students in underfunded and rural districts have been the most negatively impacted by this sudden change to remote instruction. The Covid-19 pandemic has intensified inequities ranging from restricted access to medical resources...to the many levels of the digital divide limiting schools' and communities' access to distance learning (National Digital Inclusion Alliance [NDIA], 2018; Perrin, 2019). Herold (2020)

describes how "large gaps in the nation's broadband infrastructure have also left millions of rural and poor families without reliable internet service. Moreover, some schools "[didn't] have enough computers or tablets for all their students, or an adequate plan to distribute the devices on hand" (Herold, 2020, p. 14). These factors leave many students unable to receive the continuity of instruction being provided to their more privileged peers (Correia, 2020).

Not surprisingly, most students have suffered as a result of the transition to remote learning. Remote and even hybrid learning are expected to result in substantial learning loss amongst students (Kuhfeld et al., 2020). A serious concern exists among educators that even "short term learning losses could continue to accumulate after children return to school, resulting in large and permanent learning losses as many children who fall behind during school closures never catch up" (Kaffenberger, 2021, p. 1). In fact, a study conducted at Brown University estimated that students in elementary school grades 3 through 8 could start the 2020–21 academic year as much as a half a year behind when compared to typical grade-level expectations (Kuhfeld et al., 2020). Additional evidence suggests that measures taken by schools are unlikely to be as effective as originally hoped (Kuhfeld et al., 2020). In some instances, teachers lost contact with a significant portion of the students in their class (Lieberman, 2020). Kurtz (2020) reports that as of the first week of April, 2020, only a few weeks following the closing of schools, only 39% of teachers reported maintaining daily interactions with their students, and most of this communication occurred over email. Malkus (2020) found that only 20% of school districts met their goal of providing "rigorous" remote learning (para. 3). Furthermore, across the country, most teachers estimated that students spent

only half as much time on their learning when schools transitioned to remote instruction (Gewertz, 2020).

Even as schools reopened their doors during the 2020-2021, there remained an element of the remote learning environment: hybrid learning. A variation of the remote environment, the hybrid learning environment allows students to learn in their traditional classroom setting on some days and remotely (i.e. from home) on other days; in this scenario teachers must provide face-to-face instruction and remote instruction simultaneously (Lieberman, 2020b; Slaby, 2020). While this model has some definite benefits (i.e. in-person access to teachers and materials), there are some drawbacks as well. For example, some parents and students find the complex and ever-changing scheduling confusing. Likewise some teachers are overwhelmed by the demands of hybrid instruction (Lieberman, 2020a). Moreover,

> teachers are forced to cut corners on instruction, schools struggle to transition
> students seamlessly from in-person to remote and vice versa, and students who
> are learning at home get left behind compared with students who choose to spend
> at least some time in person (ibid., p. 8).

Inadequate resources, such as a lack of funding and a capable technology infrastructure, also make hybrid instruction difficult, continuing to result in learning loss (Lieberman, 2020).

While a lack of resources and a lack of preparedness on the part of school districts has contributed to students' learning loss, or "COVID Slide" (Kuhfeld et al., 2020), research on the transition to remote learning indicates students' inability to learn remotely in a virtual learning environment. In our country's recent attempt to transition to remote

instruction, many surveys indicate that student motivation and learning have waned as a result of online and distance learning (Kraft & Simon, 2020; Brenan, 2020; Educators for Excellence, 2020; EdWeek Research Center, 2020). Barnum and Bryan (2020) report on the disparities faced by low-income, Black, and Hispanic students as well as the general lack of engagement across the board, calling "the reality of remote instruction...somewhat more complicated than outright failure" (para 5). As many as 75% of teachers found their students to be less engaged during remote instruction compared to the traditional classroom setting, indicating also that engagement declined as remote learning continued (Educators for Excellence, 2020; EdWeek Research Center, 2020). In districts serving large populations of Black and Hispanic students or students from low-income households, engagement was lower than that of more affluent school districts (Educators for Excellence, 2020). For example, in high-poverty districts, teachers reported that only 51% of students were engaged compared to 84% of students who attended affluent schools (Educators for Excellence, 2020). Additionally, in districts with lower Black student enrollment, teachers reported engagement rates of up to 70%; however, in schools serving predominantly Black students, there was less than 50% engagement (Kraft & Simon, 2020). Whether students remained engaged in their learning or not, many parents expressed concerns over their students falling behind academically or missing out on instructional time (Diperna, 2020).

Engagement is not the only factor that negatively affects students in the online learning environment. Many believe that online learning is less effective than in-person instruction (Hart et al., 2019). June Ahn (as cited in Ordway, 2020), an associate professor at the University of California, stated that "A growing number of studies show

a negative impact on student achievement when K-12 students move to online formats compared to their usual in-school experience." Likewise, Loeb (2020) argues that online learning is less effective for most students, especially those who struggle academically. This argument is supported by a study of urban high school students randomly selected to participate in an online credit recovery course, which found that students in the online class "were less likely to successfully recover the credit than students assigned to the [face-to-face] class" (Heppen et al., 2017, p. 290). Additionally, many of the students, who participated in the study, reflected that they found the online course to be more difficult than the face-to-face course (ibid.). In another study of online "e-schools" in Ohio, Ahn and McEachin (2017) found that "[s]tudents in e-schools...have lower baseline achievement than their peers in traditional public schools...and are less likely to participate in gifted education" (p. 47). Moreover, students who participated in online learning made significantly smaller gains in reading and math and were outperformed by their peers receiving face-to-face instruction (Heissel, 2016; Woodworth et al., 2015).

There are some benefits to online instruction. Online education could provide a higher level of quality instruction compared to traditional classroom (Berge & Clark, 2005; Tallent-Runnels et al., 2006). For example, virtual classes allow students to work at a pace more conducive to their own learning needs, helping slower learners by providing an opportunity for continuous review of complex material until they reach mastery (Barbour & Reeves, 2009). Likewise, it offers faster learners the opportunity to move on when they master the material (Berge & Clark, 2005; Tallent-Runnels et al., 2006). Additionally, online courses often provide immediate feedback on performance to help guide instruction, and they also provide an interactive experience between students and

the content they are learning (Means et al., 2010; Means et al., 2013). However, for many students, online learning presents certain challenges that may be hard to overcome without requisite skills and a specific learning style (Hart et al., 2019). For instance, students who are likely to procrastinate or students who do not possess the self-regulation behaviors required of self-directed learning, will likely suffer a decrease in their academic performance due to the lack of guidance and redirection to task by the physical proximity of a teacher (Bork & Rucks-Ahidiana, 2013). Similarly, "[b]eing in person with teachers and other students creates social pressures and benefits that can help motivate students to engage" (Loeb, 2020, para. 8). Other students may simply lack the necessary Internet capabilities and technological resources needed for smooth and uninterrupted online content delivery. Furthermore some students may have trouble because they do not possess the range of necessary technological skills to access the course content or to troubleshoot when they run into difficulty (Berge & Clark, 2005).

Despite these difficulties, online learning is likely here to stay in some form or other (Schwartz et. al, 2021). As the potential for crisis continues to plague our nation and uncertainties remain regarding the ability to resume normalcy in the upcoming school years (Daniel, 2020), some element of remote instruction will remain (Schwartz et. al, 2020). Moreover, now that many schools have invested money into building a stronger technology infrastructure, providing the majority of their students with personal-use devices as well as purchasing access to numerous online platforms (Greenhow et al., 2020), it is likely that some online learning will continue within school districts. This may be in the form of virtual snow days, allowing students who are ill or traveling to attend class, or even offering flexible scheduling and continued virtual learning options

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(Superville, 2020). Whatever its purpose, remote instruction will maintain a place in many K-12 school districts (Schwartz et. al, 2020.). Therefore, in order to guarantee students' success with continued remote instruction, educators must provide students with the necessary digital literacy instruction they need to take full advantage of the remote learning environment.

Digital Literacy

Digital literacy is "the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills" (American Library Association). Likewise, Martin (2005) offers another definition of digital literacy:

Digital literacy is the awareness, attitude and ability of individuals to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyse, and synthesize digital resources, construct new knowledge, create media expressions, and communicate with others, in the context of specific life situations, in order to enable constructive social action; and to reflect upon this process. (p. 135)

Finally, Hague and Payton (2010) add:

To be digitally literate is to have access to a broad range of practices and cultural resources that you are able to apply to digital tools. It is the ability to make and share meaning in different modes and formats: to create, collaborate and communicate effectively and to understand how and when digital technologies can best be used to support these practices. (p. 2)

These definitions highlight an ability to "create meanings and communicate effectively through digital tools" as well as an ability to "search, assess, and synthes[ize] information from digital mediums" (Ng, 2012, p. 1077). These are requisite skills needed to be digitally literate (Mossberger et al., 2003). Thus, digitally literate individuals use a variety of digital resources in order to learn, conduct research, and share their research by choosing among diverse formats and modes of presentation (Hague & Payton, 2010; Martin, 2005).

Research differentiates between technical competence, which are "the skills needed to operate hardware and software, such as typing, using a mouse, and giving instruction to the computer," and information literacy, which includes "the ability to recognize when information can solve problems or fill a need and to effectively employ information resources" (Mossberger et al., 2003, p. 49). More recently, van Deursen et al. (2016) categorized technical competence as "operational skills, social skills, information navigation skills, and creative skills" (p.825). Operational skills include those one needs to use the Internet. Social skills are those one needs to use online communication and interaction methods in order to understand and exchange information and to develop social capital. Information navigation skills are those one needs to locate, choose, and assess sources of information on the Internet. Finally, creative skills are those one needs to create various types of content to publish and share with others on the Internet (van Deursen et al., 2016).

Several frameworks exist for conceptualizing digital literacy. Reynolds and Harel Caperton (2009) and Reynolds (2016) offer the "6 Contemporary Learning Practices (CLPs)" framework in order to develop digital literacy in students and include activities

described as: "Create, manage, publish, socialize/collaborate, research, and surf/play" (p. 741). Each of these frameworks is described as a "practice domain," and within each domain are "technology activities/instructional design affordances," which are the learning activities in which students engage (Reynolds, 2016, p. 741). By creating these domains, Reynolds and Harel Caperton (2009) believed that if mastery of these practices were cultivated in middle or high school, students would be prepared for engagement and participation in the digital world. Thus, in her study of a game design curriculum, using the 6 CLPs, Reynolds (2016) found an increase in student engagement, practice, and creativity. It was also found that students need "greater instructional scaffolding for information literacy and autonomous use of resources" (p. 760). This study also did not measure "actual learning or assessment of outcomes" or mastery of skills; therefore, additional research is needed on the operationalization of this framework (Reynolds, 2016).

Digital literacy instruction must provide students with the practice in each of these skills in order for students to become competent online learners. Kahne et al. (2018) and Heitin (2020) discuss the necessity of providing students with the opportunities to develop digital literacy along with developing skills in reading, writing, and mathematics. Additionally, they highlight how digital literacy will prepare students to engage in civic responsibilities and problem-solving. A digitally literate student will be able to

[C]arry out basic computer operations and access resources for everyday use; search, identify and assess information effectively for the purposes of research and content learning; select and develop competency in the use of the most appropriate technological tools or features to complete tasks, solve problems or

create products that best demonstrate new understandings; and behave

appropriately in online communities to protect oneself from harm in digitally

enhanced environments. (Ng, 2012, p. 1065)

Explicit instruction of digital literacy skills within a specific learning context as well as

providing ample opportunities to practice these skills in ways that illustrate their

importance, in both the choices made and appropriate use, are vital to the academic

success of students in developing digital literacy (Ng, 2012). In fact, Ng (2012) found

that students "perceived having improved their digital literacy through the explicit

teaching and learning in [a] course about new educational technologies and their

integration into their learning" (p. 1077). Students who are digitally literate can therefore,

"adapt to new and emerging technologies quickly;" an important prerequisite for adapting

to the remote and online learning environment that has changed our educational

landscape (Ng, 2012, p. 1066).

Implicit Theories of Intelligence

In order to improve students' digital literacy skills and to increase students'

competence with online learning (whatever form it may take) as well as to boost their

overall performance, it is necessary to understand, or change, students' (and in some

respects teachers') implicit theories of intelligence (ITI). The ITI are the fundamental

beliefs that intelligence is both fixed and unchanging (entity belief) or malleable and able

to be developed (incremental beliefs) (Dweck & Leggett, 1988). A great deal of research

on these beliefs has uncovered that both have important implications for students'

creation of goals, attributions to success or failure, as well as various academic outcomes,

such as grades and test scores (Aronson et al., 2002; Blackwell et al., 2007; Good et al.

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2003; Robins & Pals, 2002). Likewise, these beliefs are also associated with self-handicapping, underachievement, and disengagement (Rhodewalt, 1994). Finally, implicit beliefs "uniquely target students' beliefs about the potential for change" (de Castella & Byrne, 2015).

Students' Implicit Theories of Intelligence

For students of relatively equal intellectual ability, their implicit beliefs regarding intelligence tend to inform their approach to academic challenges and performance (Blackwell, et al., 2007). Specifically, students who endorse an entity theory, tend to adopt performance goals, allowing them to prove their abilities while avoiding negative evaluations of those abilities (Dweck, 1999). They believe that if they are smart when they perform well, but believe they are not smart when they must exert effort, or if they simply do not perform well (Liu, 2021). When faced with an academic challenge, these students tend to give up or withdraw effort if the outcome of their performance is likely to be negative (Blackwell, et al., 2007). Moreover, they respond negatively to poor performance feedback by making "sweeping generalizations about their lack of ability...and show debilitation over time" (Liu, 2021, p. 2). On the other hand, students who foster the incremental theory tend to adopt learning goals aimed at increasing and improving their abilities (Dweck & Leggett, 1988); they believe in the benefit of exerting effort (Hong et al., 1999); attribute low-effort to failure or negative performance feedback (Henderson & Dweck, 1990); and either increase their effort or change their strategies in order to improve after a setback (Robins & Pals, 2002). Overall, ITI have "differential effects on cognitions, emotions, and behavior in achievement contexts" (Smiley et al.,

2016, p. 879), suggesting that students' implicit theories affect their overall academic performance over time.

Research on Students' ITI. These beliefs have been tested multiple times in a variety of laboratory and real-world academic settings. Research dates back to the 1970s when Dweck and associates began studying motivation and students' responses to setbacks and obstacles (Dweck & Reppucci, 1973; Dweck, 1975; Diener & Dweck, 1978). Then in the late 1980s Dweck & Leggett (1988) and mid-1990s, Dweck et al. (1995) offered the idea for a model, suggesting that individuals' ITI and goals create a motivational structure which guides their performance efforts and achievements. This model posits that an entity or incremental theory of intelligence orients an individual's focus on different goals as well as internal factors that explain performance (Hong et al., 1999). Additionally, both entity and incremental theorists see ability and effort as factors which influence performance, the implicit theory they hold will cause them to assign different weights to each. Specifically, entity theorists will weigh ability more heavily while incremental theorists will weigh effort as more important to overall performance (Hong et al., 1999). In fact, in their own study Hong et al. (1999) found that "entity theorists...were less likely to make effort attributions than were incremental theorists...Furthermore, incremental theorists were found to be more likely...to take remedial actions in the face of setbacks (p. 597).

In another study conducted by Tabernero & Wood (1999), they found that "implicit theories of ability influence performance on a novel and complex task and that these effects are mediated through both cognitive and affective self-regulatory responses to the task" (pp. 121-122). Specifically, students who possess an incremental theory,

when approaching challenging tasks, "handle the inevitable setbacks and substandard performance that arise" especially when they are supported in their belief that "task ability can be developed through practice and experience" (Tabernero & Wood, 1999, p. 122). Contrarily, students possessing an entity theory, found setbacks and feedback about poor performance to be indicative of a lack of ability and "became discouraged, self-doubting, and dissatisfied, and tr[ied] to avoid challenges and perform[ed] less effectively on complex, novel tasks" (Tabernero & Wood, 1999, p. 122).

In a study specifically testing Dweck's model in a real-world situation (as opposed to a laboratory context) Robins and Pals (2002) supported the idea that an individual's ITI have important academic implications. First, their findings support the claim that implicit self-theories are stable over time (Robins & Pals, 2002). Secondly, their findings support the idea that

> self-theories were related to the goals individuals pursue...as well as to their
> attributions, emotions, and behavioral responses to challenging academic
> circumstances...Entity theorists adopted performance goals...in an effort to prove
> or document their fixed ability level, whereas Incremental theorists adopted
> learning goals...in an effort to improve or increase their malleable ability level.
> (ibid., p. 329)

These findings help to demonstrate the effects of ITI in the academic context, helping us to understand why some students approach challenging academic situations with a goal towards mastery while others see challenges as unconquerable obstacles, which ultimately determine their own self-worth (Robins & Pals, 2002).

Still another study, conducted by Blackwell et al. (2007), which monitored students' progress during a transition into middle school, supported the idea that students who hold an incremental ITI also "endorse stronger learning goals, hold more positive beliefs about effort, and make fewer ability-based, 'helpless' attributions" and are more likely to "choose more positive, effort-based strategies in response to failure" (p. 258). Additionally, similar to Robbins & Pals' (2002) findings, Blackwell et al. (2007) noticed that students' ITI beliefs were relatively stable over time, and saw an increase in performance indicators (i.e. grades) over time. Finally, this study also showed that teaching students a malleable theory of intelligence had positive effects on students' motivation and those students showed no further declines in performance after the intervention (Blackwell, et al., 2007). This indicates that even short-term ITI interventions that promote an incremental theory, can alter students' theories and them improve their academic performance moving forward (Blackwell, et al., 2007).

Several other studies, support these earlier findings regarding students' ITI, goal for achievement, and perseverance (or lack thereof) in the face of academic challenges (Dinger & Dickhäuser, 2013; de Castella & Byrne, 2015; Smiley et al., 2016). It was found that there is a direct causal relationship between students' conceptualization of an incremental ITI and setting mastery goals for achievement (Dinger & Dickhäuser, 2013; de Castella & Byrne, 2015; Liu, 2021). Additionally, these students are likely to attempt to improve performance after a setback due to their learning goals as well as in their belief in the efficacy of effort in achievement (Smiley et al., 2016). Concerning students who possess an entity ITI, studies found more likely to "engage in maladaptive self-protective strategies that may ultimately serve to undermine academic performance" (de

Castella & Byrne, 2015, p. 258; Smiley et al., 2016). These students were found likely to "withdraw from challenges" primarily due to their belief in their own lack of ability as a reason for poor performance as well as experiencing a lack of interest or excitement following a setback or negative feedback (Smiley et al., 2016).

Research on Teachers' ITI. From the studies of students' ITI, evidence was found suggesting that direct instruction and intervention promoting incremental theories of intelligence could have positive effects on students' achievement, including decreasing their avoidance behaviors (Blackwell et al., 2007; Schnelle et al., 2010; Wang et al., 2018). For example, Wang et al. (2018) found that students' goals can be changed by first helping students understand their avoidance behaviors and highlighting the negative effects these behaviors have on performance and achievement. Secondly, students can be taught to adopt positive adaptive goals and behaviors and given opportunities to practice them until they become second nature. Likewise, Schnelle et al. (2010) discovered that providing resources, such as extended time for learning, family and friend support, and increasing self-confidence also contribute to adaptive behaviors and the creation of approach goals.

Thus, Liu (2021) posits that educators must adopt a "two-pronged approach—the nurturance of an incremental mindset and mastery- and performance-approach goals— would be useful for the promotion of intrinsic motivation and academic performance (p. 10). An incremental mindset, or incremental ITI, has been explained thoroughly in the preceding sections. As mentioned by Liu (2021), there are two major types of goals thought to represent qualitatively distinct approaches to competence. A mastery goal focuses on the development of academic ability as it relates to personal growth. A

performance goal, on the other hand, focuses on academic proficiency as compared to others (Ames & Archer, 1988; Dweck & Leggett, 1988; Nicholls, 1984). While the achievement goals students embrace are "evidenced by the beliefs and behaviors" of those students, so too, are the learning environments "distinguishable on the basis of underlying achievement goals" (Shim et al., 2013, p. 86). Moreover, "[t]he achievement goals that are most commonly supported, valued, and promoted in a learning context determine its achievement goal structure" (p. 86). Therefore, classrooms that foster a mastery goal design prioritize learning, mastery, effort, and personal advancement. However, classrooms that foster performance goals include competition and direct comparisons among learners (Anderman & Wolters, 2006; Urdan & Turner, 2005).

Research indicates that teachers' ITI are likely to affect their creation of mastery or performance goal structures within their classroom environment. Teachers who foster an incremental theory believe that students can grow their intelligence over time (Dweck & Molden, 2005). Consequently, they establish a motivational environment which values effort and advances student learning and achievement (Trouilloud et al., 2006). Shim et al. (2013) explains that "[w]hen adopting a view that all students can show improvement, teachers are more likely to see the worth in promoting individual student gains and promote greater equitable access to instructional support and encouragement in their classrooms" (p. 88). Contrarily, if teachers hold the belief that students' intelligence is fixed and unchanging, they will not see their own efforts to improve student ability as having any effect on overall student intelligence (Deemer, 2004). Likewise, Butler (2000) demonstrated that these teachers will likely make judgments about students' abilities following an evaluation of initial performance and are unlikely to change their initial

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perception. Such teachers are more likely to praise students who they consider gifted, smart, or talented. This type of comparative praise among students will lend itself to a competitive classroom environment (Patrick et al., 2001). Thus, these teachers will likely focus their instructional resources to support high-ability students, developing a performance goal environment.

In addition to teachers' achievement goals that guide their teaching, the beliefs they hold about students' intellectual development will likely impact the principal goal frameworks within a classroom (Shim et al., 2013). Seaton (2018) explains that "a teacher's own mindset belief and practice is vital to supporting students to consider their own mindsets and to develop thinking strategies to support their learning (p. 43). An interesting connection to this notion is Hattie's (2012) visible learning. Hattie (2012) discovered that many classroom practices have a strong effect on student learning, for example teacher-student rapport and the amount and type of feedback provided to students about their performance. He argues that if the processes of teaching and learning are visible and if metacognition (thinking about thinking) is explicit, the likelihood of students attaining high levels of achievement is much greater. Therefore, teachers must view learning in the same ways as their students, offering support, scaffolding their learning, and providing opportunities for them to become masters of their own learning (Hattie, 2012). Thus, it is believed that teachers' beliefs have the greatest influence on student learning and achievement, and should exert this influence (Hattie, 2012). Further, teachers' mindsets themselves and their students influence their expectations, teaching practices, and how students shape their mindsets (Seaton, 2018).

Growth Mindset

Growth mindset is an ITI which endorses the idea that intelligence is malleable (i.e. incremental) and individuals can increase their intelligence through concerted effort, hard work, and learning from setbacks and failure (Dweck, 2012; Dweck, 2015; Dweck, 2017). Growth mindset "is marked by a willingness to expend effort and learn from mistakes" (Davis, 2016, p. 12). Individuals with a growth mindset are not interested in proving over and over how smart they are by engaging in comfortable and safe tasks; instead, they seek out novel and challenging tasks, believing that with hard work, effort, and training, they can overcome challenges, improve their performance, and learn new skills - essentially increasing their intelligence (Davis, 2016). Additionally, growth minded individuals do not let failure define them, but rather they use failure as an opportunity to learn, grow, and improve (Dweck, 2017).

Intelligence can be Developed

Individuals with a growth mindset believe that intelligence is malleable, which can be nurtured through learning. This does not mean everyone learns at the same rate; instead, it means that individuals can further develop their intellectual ability (Blackwell el al, 2007). Recently, studies have shown that focused interventions which convey a growth mindset to students have encouraging effects on student learning (Aronson et al., 2002; Good et al., 2003; Claro et al., 2016). These interventions are based on the evidence of brain plasticity and malleability. Conveying messages that one can increase intelligence, teaches students to imagine their brains as muscles that get stronger when new things are learned (Bettinger et al., 2018). Even short-term interventions have an impact, demonstrating the brain's ability to process new information while revealing the

value of effort and its impact on students' learning. Such interventions have great potential for children in all grade levels (Uluduz & Gunbayi, 2018). For example, in a study of math classes in a New York City school, students who were taught an incremental theory of intelligence showed increases in math grades relative to those holding a fixed intelligence theory (Blackwell el al, 2007).

Effort is the Way to Mastery

Effort and hard work are risks, but they are worth the reward. Individuals with a fixed mindset avoid risks; instead they stay in their comfort zone and accomplish whatever will reaffirm their intelligence and skills (Dweck, 2017). For growth-minded individuals, effort is what ignites people's intelligence and allows them to use it on their path to learning (Dweck, 2000). Extolling students for their learning processes, such as commitment, persistence, strategies, and progress nurtures their motivation. The "incremental theory" of intelligence holds that intelligence can be enhanced through one's efforts and hard work (Dweck, 2000). Incremental theorists focus more on learning, believe in the value of effort, attribute low effort, not ability, as causes of failure, and increase effort or change strategy to overcome setbacks. With Growth-Mindset interventions, students learn that the brain develops when they attempt challenging tasks; using effort and hard work helps them to overcome these challenges as well (Claro et al., 2015). Growth-minded students consistently show increased effort, seek challenges, display self-confidence, and achieve higher levels of success (Dweck, 2000).

Failure and Mistakes are Opportunities to Learn

There is a connection between mindsets, attributions (what students regard as reasons for mistakes), and contrasting reactions to failure is well established across

students' development (Dweck, 1975; Dweck & Reppucci, 1973; Hong et al., 1999; Mueller & Dweck, 1998). Continuing Dweck's work on failure, Moser et al. (2011) and Schroder et al. (2017), using studies of neural responses to errors, found that growth-minded individuals showed an "enhanced error positivity (PE) amplitude," (Schroder et al., 2017, p. 42) which are brain signals, reflecting awareness of mistakes and improving performance after receiving feedback. These studies confirm the link between "neural underpinnings" and growth mindset with important implications for academic performance (Moser et al., 2011; Schroder et al., 2017). In fact, students who possess a growth mindset use failure as an opportunity to "mobilize their resources for learning" (Dweck, 2017, pp. 57-58), where students find setbacks "motivating" and "informative," influencing growth and learning (ibid., p. 99). Hence, when it comes to learning from mistakes and failure, it is important that students are taught to focus on process rather than product (Dweck, 2017). When students learn to focus on the process, they can gauge what they have learned versus what they still need to learn. It is this process that inspires students with a growth mindset to "dig in" and do what was necessary in order to succeed (Dweck, 2017).

It is possible to learn how to change one's mindset through direct and intentional instruction and training (Dweck, 2017). Paunesku et al. (2015) explained that "[g]rowth mindset interventions convey that intelligence can grow when students work hard on challenging tasks—and thus that struggle is an opportunity for growth, not a sign that a student is incapable of learning (p. 785). Several studies have highlighted the effectiveness of growth mindset interventions on student achievement. For example, Aronson et al. (2002) provided growth mindset training to college students. After three

hours of training, those college students explained what they learned about growth

mindset to middle school students. This experience had the effect of raising the college

students' semester grades (Aronson et al., 2002). In another study, researchers provided

middle school students with eight growth mindset workshops, and as a result the

students' math scores improved (Blackwell et al., 2007; Good et al., 2003). Finally, other

growth mindset interventions, such as sense-of-purpose interventions (Yeager &

Bundick, 2009; Yeager et al., 2014) and relevance interventions (Hulleman &

Harackieqicz, 2009) has led to sustaining motivation and raising student achievement

(Yeager et al., 2014).

Dweck (2006) found that individuals who possess a growth mindset have a unique

hunger for learning, rather than simply a hunger for approval or affirmation regarding

how smart one is. This hunger, coupled with an ability to persevere in the face of

challenges and adversity, is the epitome of what educators wish for our students to

achieve. Dweck's research with children and adults, beginning more than 40 years ago,

has demonstrated how a belief that intelligence can be increased, and that hard work and

effort can lead to mastery, has inspired individual students to attempt challenging tasks

and persist even in the face of failure and setbacks (Dweck, 2000; Claro, et al, 2016).

Early Growth Mindset Research

Dweck began her mindset research with studies of learned helplessness and

motivation. Learned helplessness is an expectation after experiencing an uncontrollable

event that all future events will be uncontrollable as well; this is especially true when

events result in failure. Learned helplessness often leads to three deficits: motivational

cognitive deficit, and emotional (Maier & Seligman, 1976). Dweck and Reppucci (1973)

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found that despite similar levels of motivation and ability, when subjected to failure, some children's performance declined while other children's performance did not. In the face of failure, some children attributed the failure to the influence of some outside factor. The other children placed a much larger emphasis on their individual efforts to influence outcomes (Dweck & Reppucci, 1973). Thus, early in her exploratory career, Dweck began to notice a difference in the ways children approach challenges and respond to failure. Dweck (1975) then studied the effects of a training program which shows children the relationship between their effort and failure as opposed to failure being related to lack of ability or an outside influence. In this study, Dweck also learned that success only procedures were short-sighted and to assist children in facing failure, programs should include methods that directly provide strategies that help children learn from failure.

To that end, Diener and Dweck (1978, 1980) continued their study of children identified as helpless or mastery-oriented and explored the differences in their performance following failure. The results of these studies showed that children who were interested in mastering a task used learned problem-solving strategies in order to overcome challenges and while success reinforced a personal belief in their abilities, failure did not weaken this belief (Diener & Dweck, 1978; Diener & Dweck, 1980). Next, Benenson and Dweck (1986) studied the types of traits children assign to themselves in both academic and social domains. The study found that social trait identification emerged earlier than academic trait identification. Another finding indicated that trait explanations for success were uncovered earlier than those for failure. Then, Dweck and Leggett (1988) undertook research that looked at the goal-setting patterns of children

relating to learning and to helpless or mastery-oriented patterns uncovered in previous research (Dweck & Reppucci, 1973; Dweck, 1975; Diener & Dweck, 1978, 1980). It was again found that some children develop "maladaptive" helpless responses to challenges and failure, while others thrive on failure and challenges, as reflected in their goal-setting patterns. Subsequently, Cain and Dweck (1995) found that the belief patterns associated with motivation in older children were already associated with motivational patterns of young children, as well as clear evidence of helplessness and mastery-oriented responses across all grade levels. The research, which remains consistent throughout these studies, is that there are two distinct beliefs – fixed mindset and growth mindset – that contribute to motivation, effort, and responses to failure.

Continuing and Contemporary Growth Mindset Research

Since the time of Dweck's seminal studies, growth mindset research has continued. For example, in a case study conducted of a 7th grade Language Arts class, Strahan (2017) found that 7th graders are "capable of understanding the construct of mindsets and describing ways that their mindsets influence personal learning and performance" (p. 14). However, while students were able to explain the application and importance of growth mindsets, they did also share examples of giving up on tasks that became too difficult (Strahan, 2017). Therefore, more research is needed, perhaps using students as researchers in order to give them the opportunity to make connections between growth mindset ideas and the application of those ideas to learning and overcoming obstacles (Strahan, 2017). In a national experiment on the effect growth mindset has on student achievement, Yeager et al. (2019) highlighted how a "low-cost treatment" which was delivered to students in "less than an hour" had a positive impact

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on students' grades as well as a "consequential outcome" for "advanced math course-taking" (p. 368).

Zeeb et al. (2020) conducted a study of growth mindset training integrated into a physics classroom. The results of the study were mixed, registering that there was "a positive and stable effect on students' beliefs about abilities towards growth mindsets" (Zeeb et al., 2020, p. 11). However, the researchers found no effect on students' self-belief, meaning the students' beliefs that their own abilities can change did not increase (Zeeb, et al., 2020). Still, the training did buffer the demotivation that occurred throughout the course among all students, showing a slightly less decrease in students who received the training versus those who did not (Zeeb et al., 2020). Nevertheless, this study was considered a success in that there were observed effects on students' mindsets and motivation.

Finally, in a study of a randomized controlled setting, Xu et al. (2020) found that "promoting a growth mindset leads to a higher growth mindset belief, stronger mastery goal orientation, lowered perception of intrinsic (task complexity) and extraneous loads (design of learning materials, and better retention and transfer performance (pp. 4, 8-9). There are also a couple of implications which resulted from this study. First, this study highlights the potential of providing growth mindset instruction in close proximity to teaching new skills or other learning activities. This idea supports the notion advocated by Dweck and Yeager (2019) that a way to make growth mindset more lasting is to create an "environment with instructional tasks and practices that foster a growth mindset" (p. 10). The second implication of this study relates to the idea of reducing cognitive load. Martin & Evans (2018) highlight the importance of reducing cognitive load as a strategy

for designing effective instruction and learning activities. Although Xu's (2020) study focused on implementing growth mindset beliefs prior to instruction, it is possible that these beliefs could vary during in the course of differing learning situations; therefore, additional studies are needed in order to gauge the efficacy of growth mindset interventions on learning conditions containing differing levels of "intrinsic and extraneous loads" (p. 13).

The Use of Growth Mindset Practices Among High School Students

Donahoe et al. (2012) investigated the use of a computer program, Brainology, and its effects on students' mindset and resilience. While initial changes in students' mindsets were observed, they were short-lived and students reverted back to more of a fixed mindset by the follow-up. An interesting qualitative finding showed that students understood that intelligence included an application of effort; however, this too, was not sustained at the follow-up (Donahoe et al., 2012). Contrarily, a study conducted using 13 U.S. high schools found that two 45-minute interventions, in which students read articles about the malleability of the brain and the potential to increase intelligence through effort and specific learning strategies, raised the achievement of a diverse group of underperforming students during a semester. As a result of the interventions, students saw an improvement in their GPA and course grades in core academic classes (Paunesku et al., 2015). In another study, this time using a three-session mindset intervention, focusing on academic performance, growth mindset beliefs/behaviors, and school attendance, Brougham and Kashubeck-West (2018) found that the intervention was successful in terms of positively impacting mindset beliefs. However, no positive impact on GPA was observed although other studies did produce positive results (Paunesku et al., 2015;

Yeager et al., 2019). A slight improvement in attendance rates were observed, but were statistically insignificant (Brougham & Kashubeck-West, 2018). These findings were promising, however, and further research that includes more participants and a longer time frame is expected to show more results similar to other studies.

Additionally, a study conducted by Binning et al. (2019), it was found that growth mindset interventions were effective with a subset of students, particularly, "[B]lack students with high educational expectations" (p. 280). For this group of students, "the intervention resulted in better grades over the course of the year, and...higher cognitive engagement: (p. 280). The intervention did not have these effects for White students (regardless of educational expectations), nor for Black students (with low educational expectations) (Binning et al., 2019). These findings are consistent with Yeager and Walton (2011) who noted that growth mindset interventions are not a cure-all; instead, students need more than assurances that they can succeed, they need to possess high educational expectations for themselves as well. In a similar study, using a web-based platform, growth mindset interventions were provided to a group of students living in an impoverished rural community. The results indicated, immediately and four months later, that the intervention did lead to stronger growth mindsets. These mindsets, in turn, predicted "more positive academic attitudes including learning motivation and learning efficacy and correlated with higher final grades as well" (Burnette et. al., 2018, p. 443). This study highlights the potential of growth mindset, in combination with other effective techniques, can be found to counteract the disadvantages which plague students living in poverty or rural areas; likewise, such practices have also been found to assist students achieve their academic goals (Burnette et. al., 2018).

Teaching Growth Mindset

Fraser (2018) states that the "interventions to promote growth mindset thinking in learners can take many different forms" (p. 647). Blackwell et al. (2007) further suggests that if students understand how the brain works in addition to how learning can increase intelligence, they will begin to take control and responsibility over their own learning. Although temporary interventions that promote growth mindset thinking only bring about a short-term impact, Dweck (2010) proposes that a school's culture and learning philosophies can help students change their approach to learning while also encouraging a growth mindset. Moreover, Woodbridge et al. (2014) found that a key to ensuring intervention sustainability is a staff who believes in the effectiveness of the intervention. As such, any work attempted by teachers must have the full support of school administrators (Woodbridge et al., 2014).

In her study of a primary school and their application of growth mindset principles, Fraser (2018) found that several areas which contributed toward their success, included "research and professional reading, collaboration between staff, belief in the approach, removal of ability groups, teacher language, [and] promoting mistake making" (p. 653). Additionally, it was identified that a significant amount of work had been undertaken by the school staff prior to implementing the intervention and growth mindset strategies and principles. These strategies included the reading and discussion of research materials, so the staff could help foster growth mindsets in students. Additionally, the school involved students' families in learning about the approach by holding information sessions and engaging in conversations with them (Fraser, 2018). Overall, the application of growth mindset principles were believed to be helping students although continued

work is still needed even after three years. Several areas, such as "learning opportunities outside the classroom, pupil responses to challenge, and pupil responses to mistakes" (Fraser, 2018, p. 653) still require further development in order to fully support the growth mindset teaching and learning.

Robinson (2017) also offers several approaches to incorporating growth mindset into the classroom. These approaches include:

creat[ing] study tools that incorporate active learning methods...normaliz[ing] mistakes and failure...refram[ing] language when communicating expectations and feedback...practic[ing] positive self-talk...us[ing] data to set growth-oriented goals...involv[ing] students in tracking progress and setting goals to invest them in their learning process…[and providing] additional growth mindset resources. (pp. 18-20).

Davis (2016) adds several more suggestions to this list. She includes:

adopt[ing] a process- rather than a product-based goal system...allow[ing] ample opportunities for students to try new things in low-stress, fun ways...help[ing] students' efforts lead to real results [by] design[ing] instruction that builds on the idea of desirable difficulty...let[ting] students struggle...model[ing] reflection and metacognition...emphasiz[ing] hands-on activities in which students work together and can fully engage in the process of discovery...emphasizing the role of effort in the achievement of a goal...be[ing] aware of your own fixed mindset tendencies...confront[ing] failure [by] empathiz[ing] with the students and encourage the development of problem-solving skills...analyz[ing] the most common mistakes on a test or quiz with the class…[and] maximiz[ing] learning

through embracing error (Davis, 2016, p. 15).

These strategies will help teachers in any grade level across every content area to implement growth mindset into their classroom practices and instructional activities (Davis, 2016). Additionally, growth mindset practices have the potential to help students increase their digital literacy skills. Ng (2012) explains that "digital literacy is developmental, that is, progressively builds on foundational and achieved skills and knowledge (p. 1066). Additionally, as Xu et al. (2020) points out, providing growth mindset instruction immediately prior to teaching new skills is effective in assisting students learn those new skills. Therefore, growth mindset instructional practices offer the best opportunities for teachers to teach students the digital literacy skills they need for success in any type of learning environment.

Conclusion

The continued threat of the digital divide (Cohron, 2015) and the ever-changing educational landscape as a result of the COVID-19 pandemic and subsequent adoption of remote instruction (Herold, 2020) has shined a light on the vastly diverse and relatively insufficient digital literacy skills our students possess (Berge & Clark, 2005). There is a need to adopt specialized teaching strategies in order to better improve our students' digital literacy skills in hopes to prepare the to become contributing members of our technologically-drive, global society (Kahne et al., 2018) as well as to continue to narrow the digital divide between economically disadvantaged students and their more privileged peers (Cohron, 2015; West,).

The growing body of literature on implicit theories of intelligence emphasizes the role they play in student achievement. Likewise, a teacher's implicit theories also impact

the classroom environment and the expectations teachers hold for students. These expectations have many implications regarding student performance and success. Similarly, the literature and research regarding the effectiveness of students adopting a growth mindset has provided evidence of the success growth mindset interventions have leveraged with regard to student motivation and academic success. Although short-term growth mindset interventions have yielded mostly short-term results, studies imply that with focused, long-term interventions, there is a potential for long-term benefits.

One area of research that remains scarce in the literature is how teachers' classroom practices promote a growth mindset among students (Dweck & Yeager, 2019). My research will incorporate what is known about growth mindset practices in the instructional environment in order to investigate how teachers' growth mindset practices are used to provide digital literacy instruction and how their practices changed after transitioning to remote learning.

Chapter 3

Purpose of the Study

The purpose of this explanatory sequential mixed methods study was to explore the ways in which high school teachers use instructional practices that promote a growth mindset among their students, how those practices are used to improve digital literacy, and how these practices evolved during the transition from face-to-face instruction to remote instruction. While this may appear to be a relatively benign transition, the digital divide which exists between students from low-SES backgrounds and their more advantaged peers, creates uneven access to quality education. From inconsistent access to devices and the Internet to a significant lack of digital literacy skills among students, remote instruction presented new challenges for teachers and students. Therefore, this study aimed to explore not only how teachers are using instructional strategies to promote growth mindset, but how those strategies are helping to improve students' digital literacy in order to narrow the digital divide.

Research Questions

1. How many high school teachers, who responded to the survey, promote a growth mindset in their learning environment?

2. How many high school teachers, who responded to the survey, incorporate digital literacy instruction in their instructional practices?

3. What instructional practices are being implemented by high school teachers to promote a growth mindset among their students?

    a. How are teachers' using instructional practices that promote growth mindset to improve students' digital literacy?

b. How are growth mindset practices used to promote digital literacy in high schools located in privileged school districts different from those used to promote digital literacy in disadvantaged school districts?

3. How have high school teachers' instructional practices that promote a growth mindset among their students evolved to accommodate the remote learning environment?

a. How have high school teachers used the transition to a remote learning environment to change their instructional practices in order to address students' digital literacy needs?

Rationale for and Assumptions of Mixed Methods Research

Mixed methods research (MMR) is an investigation into an identified problem in which the researcher generates a combination of qualitative and quantitative data to address complex research problems (Creswell & Plano Clark, 2018). Early evaluative researchers characterized MMR as including a quantitative method and a qualitative method, but where neither method was directly linked to a specific research paradigm (Greene et al., 1989). Tashakkori and Teddlie (1998) revised this definition, suggesting that MMR combines both methods of data collection into all phases of the research process as one methodological orientation (Tashakkori and Teddlie, 1998). This orientation included theoretical views of the world, methods, and the overall interpretation of the results. Thus, mixed methods evolved as a distinct methodology which included its' own views, lexicon, and techniques (Tashakkori and Teddlie, 2003). Taking the descriptions of MMR that had come before, Johnson et al. (2007) combined many of these definitions in order to devise a more comprehensive definition:

Mixed methods research is the type of research in which a researcher...combines

elements of qualitative and quantitative research approaches...for the purposes of

breadth and depth of understanding and corroboration. (p. 123)

In this definition, Johnson et al. (2007) related the definition to the rationale for using a

mixed methods approach. They suggested that by mixing both quantitative and

qualitative data, the researcher can generate a greater understanding of the phenomenon

under study.

Greene (2007) proposed a slightly different conceptualization of mixed methods,

one that allows for researchers to contribute to an ongoing conversation offering multiple

ways of understanding the data being collected, various perspectives of what is to be

valued, and diverse means of making sense of the phenomenon under study. Finally,

Creswell and Plano Clark (2018) offered a definition for MMR which combined

methods, research design, and philosophy orientation" (p. 5). Thus, they asserted that the

researcher, using an organized and logical research design framed within theory and

philosophy, rigorously gathers and examines both quantitative and qualitative data and

merges both types of data and their results to answer research questions or support a

hypothesis. The resulting combination of both types of data leads to a greater

understanding of the problem or phenomenon under study allowing the researcher to

offer new insights that go beyond what quantitative or qualitative data can provide alone.

MMR is best when results need to be further explained, inferences need to be

drawn from findings, the initial research design needs to be extended or improved,

similarities and differences between cases need to be explored, participants will be

involved in the research, and/or a particular program needs to be appraised (Creswell &

Plano Clark, 2018). Qualitative data often provides a thorough understanding in a particular context of a particular research problem while quantitative data may provide a more generalized explanation (Creswell & Plano Clark, 2018). When researchers collect only qualitative data, they lose the ability to generalize the findings. Contrarily, when researchers collect only quantitative data, a deeper understanding is lost (Creswell & Plano Clark, 2018). Therefore, MMR is superior to single-approach research design because it concurrently addresses a collection of confirmatory and exploratory questions using both quantitative and qualitative approaches, suggesting new insights that go beyond what either approach offers separately, providing stronger inferences in data analysis, and offering an array of differing views (Teddlie & Tashakkori, 2009; Creswell & Plano Clark, 2018).

Although quantitative and qualitative data may each draw distinct inferences in response to a research question, in mixed methods research, both data sets are combined or integrated in a way that provides a more comprehensive extrapolation in response to research questions. The data sets should complement each other, providing support for the results generated by each individual data set. Since there are always limitations to the singular use of qualitative or quantitative data in research, mixed methods research provides an extensive analysis of the complex issues being investigated. When using a mixed methods approach, the weaknesses of the one method can be balanced by the strengths of the other, leading to a more complete understanding of the research questions being investigated (Creswell & Plano Clark, 2018).

Research Design

For this study, I chose an explanatory sequential design. The explanatory sequential design occurs in two unique interactive phases, beginning with the gathering and examination of quantitative data (Creswell & Plano Clark, 2018). Following the quantitative phase, qualitative data is collected and analyzed in order to further interpret the quantitative results (Creswell & Plano Clark, 2018). The explanatory design is well suited for a study in which the researcher requires the use of qualitative data to explain significant, or insignificant quantitative data, data that exemplify the phenomenon being studied, outliers, or data that is confusing or surprising (Creswell & Plano Clark, 2018). This design is also appropriate when a researcher intends to form groups based on the quantitative results and follow-up with those groups during the qualitative phase (Tashakkori & Teddlie, 1998). Likewise, the researcher may use the quantitative results to inform purposeful sampling for the qualitative phase (Tashakkori & Teddlie, 1998).

The procedures in an explanatory mixed methods design are the most straightforward of all the mixed methods design procedures (Creswell & Plano Clark, 2018). The first step involves the design and implementation of the quantitative strand. This phase includes the development of research questions and quantitative instruments for data collection; the identification of the sample and collecting the data, and the analysis of the data with descriptive statistics in order to facilitate the selection of participants for the second phase of the study (Creswell & Plano Clark, 2011). Step two involves determining which results will be explained and using those results to refine research questions, select participants, and design the protocols for collecting the qualitative data (Creswell & Plan Clark, 2011). Step three includes the design and

implementation of the qualitative strand. Similar to step one, this step includes the development of qualitative research questions, the selection of the sample and collecting the data, and the analysis of the data through theme development and similar qualitative approaches (Creswell & Plano Clark, 2011). Finally, in step four, all quantitative and qualitative results are summarized, combined, and interpreted to determine the extent to which the qualitative data helps to explain the quantitative data (Creswell & Plano Clark, 2011).

There are two variations of the explanatory sequential design: the follow-up explanations variant and the case-selection variant (Creswell & Plano Clark, 2011). For this study, I used the case-selection variant. This variation places a greater emphasis on the qualitative phase of the study. It is used when a researcher is focused on a qualitative examination of a phenomenon but requires preliminary quantitative results in order to purposefully choose the best participants (Creswell & Plano Clark, 2011). It was important that I identify participants who had experience using growth mindset practices and providing digital literacy instruction that would participate in the qualitative phase of the study. Therefore, a preliminary quantitative phase was necessary in order to discern those participants who actively used these instructional practices. From the data collected by the quantitative surveys, it was possible to establish which cases would best provide the qualitative data needed for a more in-depth analysis of these methods.

A mixed methods explanatory sequential approach was ideal for this particular study because there exists a need to collect more thorough and substantial results as well as a need to more completely explain initial results (Creswell & Plano Clark, 2018). Through the use of quantitative data, I was able to identify teachers who understand

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growth mindset and who actively implement practices within their classroom that foster growth mindset among their students. Additionally, the data identified teachers who directly teach digital literacy skills as well as those who incorporate growth mindset practices in digital literacy instruction. Once teachers were identified, the qualitative process allowed further exploration into the ways in which teachers incorporate growth mindset practices into their classrooms, how they use growth mindset practices to improve students' digital literacy skills, and how those practices have evolved since the onset of remote learning. Likewise, relevant documents were collected and provided additional data regarding teachers' growth mindset practices, digital literacy instruction, and their transition to the remote learning environment. The qualitative phase offered an opportunity to collect open-ended forms of data, (Creswell & Creswell, 2018) allowing teachers to share their ideas freely and provide the detail needed for a thorough and comprehensive analysis. Having both sets of data allowed for a deeper connection between the quantitative and qualitative phases of the study, including stronger inferences and detailed explanations of specific results (Creswell & Plano Clark, 2018).

Context

For this study, the focus was on public high schools throughout New Jersey, of which there are 516 in the state (NJ DOE, 2019). New Jersey education is ranked number one in the U.S (Llyod & Harwin, 2020). This ranking is based mostly on the state's school expenditures, devoting 4.8% of its tax dollars to education (Heyboer, 2019). Likewise, New Jersey ensures funding is more evenly distributed among the states advantaged and disadvantaged schools (Heyboer, 2019). New Jersey has a 90% graduation rate and 47% of its residents have a higher education degree (Ralph, 2021).

Using the entire state, I was able to include teachers who work in high schools located in urban, suburban, and rural areas. Likewise, I was able to include teachers who work in high schools located in advantaged and disadvantaged settings populated by students from lower-, middle-, and upper-SES backgrounds.

In order to determine whether a school district served advantaged or disadvantaged students, the following criteria was used: free- and reduced-price meal (FRP) eligibility, neighborhood SES, and the school district's poverty estimate (National Forum on Education Statistics, 2015). FRP eligibility is determined based on a student's household composition, income, and participation in other assistance programs such as Temporary Assistance for Needy Families (TANF) or the Supplemental Nutrition Assistance Program (SNAP) (United States Department of Agriculture, 2017). The neighborhood SES refers to characteristics, such as, the proportion of adults without a high school diploma, the median household income, and the types of household possessions that define the larger community context in which students live. Finally, the school district's poverty estimate refers to estimates of total population, total number of people in poverty, and the number of children and related children ages 5 to 17 in families in poverty. Such estimates are used to determine the administration of federal programs and funds to local municipalities and schools districts (National Forum on Education Statistics, 2015; United States Census Bureau, 2020). Therefore, schools serving large populations of students (greater than 50%) who qualify for FRP programs, are living in households with under-educated adults, and/or are living in low-income households would be considered a disadvantaged educational setting. Contrarily, schools serving populations of students in which only a small number (less than 50%) qualify for

FRP programs, while the majority (greater than 50%) reside in households with educated adults whose household earnings are above the poverty level, would be considered an advantaged educational setting.

Participants

The participants for this study were high school teachers from public high schools across New Jersey, of which there are approximately 20,000. By including such a wide selection of high schools across New Jersey, I was able to generate enough quantitative data to help identify a diverse group of interview participants for the qualitative phase of the research. Teachers who instruct in the various content areas, such as Science, Math, English, Social Studies, Physical Education, Visual/Performing Arts, Business and Career Electives, and Computer/Technology as well as Special Education were included. Such a diverse array of teachers were used in order to compare how different content area teachers use growth mindset practices in their instruction to improve students' digital literacy skills. Likewise, comparisons within and between high schools among the various districts, regions, and counties were made in order to assess the differences between the ways in which teachers use growth mindset to promote digital literacy in schools serving privileged students compared to those in school serving underprivileged students.

Sampling

Using the case-selection variant, (i.e. preliminary quantitative input design) the goal was to choose teachers who have experience with the central phenomenon or key theory being explored (Creswell & Plano Clark, 2018). A multi-stage approach was used

during the quantitative phase and maximum variation sampling was used during the qualitative phase.

Quantitative

The quantitative sample, as mentioned above, included teachers from public high schools across New Jersey. Fowler (2014) explained that when there is not an adequate or attainable list of individuals within the population being studied, a multistage approach is best. This approach allows the researcher to link the members of the population to a group that will be sampled. Lists are then generated to include individual members of the selected groups, and those individuals are surveyed. Using this approach, I first began by contacting individual County superintendents in order to identify the number of high schools and high school teachers in each county. I also contacted the New Jersey Principals and Supervisors Association (NJPSA) in order to facilitate contact with high school administrators to ask for assistance with disseminating the survey to their teaching staff. Next, I contacted union representatives from each school district to ask for their assistance as well. Finally, I visited individual high school websites in order to compile lists of teacher email addresses and to send the survey directly to them. Furthermore, I reached out to the New Jersey Education Association (NJEA) who agreed to provide a link to the survey on their social media platforms, making it available to teachers. This approach provided teachers with additional access to the survey using a forum with which they were familiar in order to generate the greatest number of responses. Because the survey was designed specifically to identify participants for the qualitative phase of the research, a predetermined sample size was not required. Once I secured the target number of interview participants, the survey was closed.

Qualitative

As a result of this approach, I was able to identify a suitable number of high school teachers for the qualitative phase of the research. Mason (2010) explains that "[q]ualitative samples must be large enough to assure that most or all of the perceptions that might be important are uncovered, but at the same time if the sample is too large data becomes repetitive and, eventually, superfluous" (para 2). There is much disagreement regarding when saturation is reached; likewise, there are various guidelines depending on the theoretical framework and the type and purpose of the study (Mason, 2010). For example, Morse (1994) suggested that 30-50 interviews were necessary for ethnography and ethnoscience studies. For a phenomenological study, Creswell (1998) suggests 5-25, while Morse (1994) suggests at least 6. While for all qualitative research, Bertaux (1981) believes that no less than 15 participants would be adequate. Although these numbers are offered to guide researchers, none of the above mentioned authors offered empirical evidence to support their recommendations (Mason, 2010). Guest et al. (2006) did offer some empirical data in their study which included 60 interview participants. They found that most of their codes were generated after the first 6 interviews while the rest of their codes were developed after 12, suggesting that "a sample of six interviews may [be] sufficient to enable development of meaningful themes and useful interpretations" (p.78). Given the diversity of these recommendations, I included a sample of 25 participants in the qualitative phase of this study.

Therefore, teachers were selected for the qualitative phase based on their survey responses which indicated that they were familiar with and actively used growth mindset practices in their instruction, had experience teaching in a remote learning environment,

adapted their growth mindset instructional practices to the remote learning environment, provided direct digital literacy skills instruction, and actively used growth mindset practices in digital literacy skills instruction. Likewise, maximum variation sampling was used in order to identify a diverse group of teachers who would likely have different perspectives and approaches to using growth mindset (Creswell & Plano Clark, 2018). Thus, I identified teachers from various content areas who, by design, would implement growth mindset practices differently due to the unique needs of their content area of instruction. Each of the content areas has their own goals and learning standards; likewise they include diverse learning strategies to help students master the material (Markworth et al., 2016). For example, Language Arts teachers use specific strategies that apply to reading comprehension and writing whereas Math teachers use strategies specific for teaching Math skills. Moreover, each content area may cause different levels of anxieties among students (Jorif & Burleigh, 2020). Therefore, instruction in every content area requires deep-rooted content and pedagogical content knowledge as well as thorough planning (Markworth et al., 2016). Teachers, then, can boost academic progress using growth mindset concepts that are geared specifically towards the content areas in which they teach (Jorif & Burleigh, 2020).

Data Collection Methods

For this study, priority was placed on the second, qualitative phase; therefore, as stated above the case-selection variant of the explanatory sequential mixed methods design was used. This design, also called "a preliminary quantitative input design" is used when the researcher is concentrating on qualitatively investigating a phenomenon but needs preliminary quantitative data in order to identify and purposefully select the

best participants to interview (Creswell & Plano Clark, 2018). Morgan (2014) adds that preliminary quantitative designs begin by identifying the needs of the core research method. She explains that the utility of the initial quantitative data comes from two design qualities of most qualitative studies, including the inclination to rely on a relatively small number of participants and the emphasis placed on the purposeful selection procedure for identifying those participants. The critical study of the small-scale, data-rich sources makes selecting the "right" sources much more important, and the preceding quantitative methods helps the researcher make those choices (Morgan 2014).

Since qualitative methods typically depend on comprehensive data from relatively few select sources, the effectiveness of these studies hinges on locating superior data sources. Quantitative methods can be used to meet this need, as they have the capacity to use large numbers of data sources in order to find individuals who meet the data collection needs of the qualitative component of the study. If the goal of data collection is to critically examine a small number of purposefully chosen sources, then it is necessary to engage in prospecting that helps to identify sources that will provide the essential data (Morgan, 2014). Thus, quantitative data was collected first and then explained by in-depth qualitative data.

Survey

The initial stage of data collection included survey research. Fowler (2014) explains that survey research produces statistics, or "numerical descriptions" about specific trends and about the perspectives and positions of the population under study. Likewise, surveys also test for relationships among select variables within a population (Creswell & Creswell, 2018). In typical survey research, questions are presented in a

specific order on a form or questionnaire and provided to a preselected group of individuals often with a goal of identifying certain attributes or behaviors among the identified population (Teddlie & Tashakkori, 2009). Surveys are designed to answer three types of questions, including descriptive questions, questions about the relationship between variables, and questions about the predictive connections among variables over a period of time (Creswell & Creswell, 2018). The survey for this study was researcher-designed and included questions pertaining to growth mindset, digital literacy, and teachers' experiences during the transition to remote instruction. Two additional, questions were also included pertaining to participants' willingness to participate in an interview and their preference for a face-to-face or virtual interview.

Using a cross-sectional survey design, an online questionnaire was developed and provided to all of the teachers in public high schools across New Jersey. A cross-sectional survey collects data from participants at one point in time (Punch, 2003). Internet surveys, which are relatively new and have strengths and weaknesses similar to mail surveys, are used in two main ways: email questionnaires or via email in which a link to an outside website is provided where the survey can be accessed and completed (Fowler, 2014). Not only cost effective, internet surveys can reach a population who have widespread access to email and who use it routinely (Fowler, 2014). Survey respondents were contacted via email with information about the survey, which included how long the survey would be available, how long the survey takes to complete, the importance and potential benefits of this research, and an assurance that participation is voluntary, confidential, and that participants can withdraw at any time. The survey was created using Qualtrics, a software that allows for easy customization of surveys and also allows

the survey to be disseminated online. Surveys were sent to participants either through school leaders, through education association representatives, or directly by me, using participants' work-related email. Additionally, a link to the survey was provided by the NJEA on their social media platforms.

The five-question, self-administered online survey consisted mainly of closed questions, allowing teachers to self-report their experiences using growth mindset, providing digital literacy instruction, and transitioning to remote instruction during the pandemic (Fowler, 2014). Self-administered surveys are the most common type of survey and are used to gather data from respondents who complete the survey themselves. As previously mentioned, a preliminary quantitative input design was used, so the survey was designed to identify respondents to participate in the qualitative interviews (Creswell & Plano Clark, 2018; Morgan, 2014). Closed questions were included because they provide response alternatives that are easily answered by the respondent which also makes it easier to interpret the responses. Likewise, providing answer options made it easier to identify respondents that meet the criteria for the qualitative phase (Fowler, 2014). Additionally, closed questions lend themselves well to both self-administered and online surveys (Fowler, 2014). A few open questions were also included, but they required a very limited response and were mainly treated as anecdotal information (Fowler, 2014).

Interview

During the qualitative phase, I conducted interviews using an in-depth, semi-structured interview design. The interview is a research strategy involving a researcher (interviewer) asking questions of a research participant (interviewee) (Teddlie &

Tashakkori, 2009). Qualitative interviews typically involve open-ended questions and are generally nondirective, allowing the participant to provide detailed explanations about their experiences (Teddlie & Tashakkori, 2009). Qualitative interview data is thus understood to be the direct result of this interaction, giving special consideration to the reflexivity and subjectivity such an exchange involves (Kelly, 2010). The data produced is not only rich and contextual (as opposed to detached and quantifiable), but is also a reciprocal accomplishment in which respondents become collaborators in the research process (Mishler, 1988).

An in-depth interview is one in which the researcher speaks with those who have direct knowledge of and experiences with the phenomenon of interest (Rubin & Rubin, 2012). In-depth interviews provide researchers with rich and detailed information, which includes examples, experiences, and personal narratives. Researchers have the flexibility to change the wording of questions, change the order of questions, exclude irrelevant questions, or generate new questions to elicit more information or follow-up on novel perspectives (Rubin & Rubin, 2012). Morris (2015) further explains that in-depth interviews are a versatile method which can be employed to study a nearly unlimited collection of topics and research questions. Moreover, the strength of the in-depth interview rests in its capacity to establish a research space in which the participant is able to tell his/her story, providing the researcher with diverse understandings and ideas about a particular topic (Morris, 2015).

The style of interview I conducted was responsive interviewing. This style of interview is characterized by a relationship of trust which develops between the researcher and the participant often lasting beyond the period of research (Rubin &

Rubin, 2012). Responsive interviews offer flexible questioning that, although semi-structured, allows for adjustment and additional questions during each individual interview (Rubin & Rubin, 2012). These interviews also recognize and embrace the emotional responses or participants, asking sensitive questions in a non-direct way that put the participants at ease (Rubin & Rubin, 2012). They are gentler and far less confrontational than other interview styles as the participants' experience is the focus and not factual information or contradictions that may arise (Rubin & Rubin, 2012). The goal of the responsive interview, like many other interview styles, is the search for a solid and deep understanding of the phenomenon being studied based on the personal perspectives and experiences of the participants (Rubin & Rubin, 2012).

Interviews were conducted both in-person at a location chosen by the participant and virtually, using WebEx. WebEx is a software program that provides a format for virtual meetings. It allowed both the participant and the researcher to be on camera during the interview in order to foster a face-to-face experience while not physically in person. Additionally, WebEx allows for the recording of the interview as well as creates a transcript of the recorded interview. The decision behind the physical context of the interview was based on the physical distance between the participant and I as well as the participants' personal preferences. Bell (2009) reminds researchers that the participants, not the researchers are in charge. After all, it is the researcher who needs the participant, not the other way around. Therefore, it was necessary for me to inform my participants that the interview would last approximately one hour. Likewise, participants had the option to change the interview time and location or to withdraw consent to participate altogether (Bolderston, 2012). Understanding that some participants would not be

comfortable with being interviewed and recorded using an online tool and may simply prefer a f2f interview, it was very important to give them the opportunity to choose a context that was most comfortable for them (Bolderston, 2012).

In-person interviews also called face-to-face interviews (f2f are overall the better option for interviewing participants, especially those who are "geographically accessible" (Given, 2008, para 2). By conducting interviews in person, it is much easier for the researcher to develop rapport with the participants, improving the likelihood that the participants will feel comfortable sharing information with the researcher. Additionally, the researcher can make careful observations during the interviews if they are in front of the participant. Such observations often include crucial nonverbal cues, including hand gestures, facial expressions, and head nodding, or shifting. Moreover, when the in-person interviews takes place in the participants' chosen setting, it is easier for them to feel comfortable because they are in a well-known environment, and it offers the researcher a chance to observe the participant in a natural context.

In order to respond to some of these challenges, as stated previously, it was left up to the participant to decide which interview format they preferred and the meeting location determined by them. Likewise, participants were informed in advance that the interviews would be recorded to ensure they would be comfortable and avoid any issues on the day of the interview. When scheduling interviews, sample questions were provided to the participants, so they would be aware of the types of questions that would be asked, giving them an opportunity to think about the topics and in advance and removing the pressure of providing in-the-moment responses. For in-person interviews, efforts were made to schedule participants in areas that were in close proximity to one another,

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allowing multiple interviews to take place in one day thus reducing travel time and expense. Additionally, a digital recording device was chosen that would produce a digital file making it easier to upload in a transcription software. For virtual interviews, the participants were made aware that WebEx would be used, so they would have ample time to become familiar with how it worked. Similarly, it would highlight any Internet connectivity issues, allowing the participants to choose a location in which the best connectivity was available. Finally, I provided the interview transcripts to all participants to review for accuracy and to allow them an opportunity to strike blatant errors or miscommunication from the record or to provide clarification when warranted.

Document Collection

Additionally, I completed a thorough document review to provide a more comprehensive analysis about teachers' instructional practices that promote a growth mindset, how these practices promote digital literacy, and how these practices evolved as teachers and students transitioned to a remote learning environment. Hodder (2012) describes documents as texts prepared for personal reasons which are more akin to verbal articulation and require more contextualized understanding. Likewise, Bowen (2009) explains that documents are composed of words and images that have been transcribed without the researcher's input or cooperation. Coffey (2014) further elaborates that documents are literary, textual, or graphic and allow for the sharing of information and the presentation of stories. Moreover, documents are artifacts which were created for a specific purpose in order to serve a particular function and can tell researchers a lot about a particular social setting or an individual. Indeed, much research would be incomplete without the collection and analysis of documentary materials (Coffey, 2014).

Bowen (2009) demonstrates how document collection can serve various purposes for a researcher when undertaking a qualitative study. First, documents provide data about the environment within which study participants operate (Bowen, 2009). Such data may detail the root causes of specific issues, indicate conditions that affect a particular phenomenon, or to contextualize interview data (Bowen, 2009). Further, documents may suggest additional questions that need to be explored or identify situations that should be observed (Bowen, 2009). Likewise, documents "provide supplementary research data" which can prove to be "valuable additions to a knowledge base" (Bowen, 2009, p. 230). Additionally, documents offer ways of identifying the change and development of a phenomenon or issue within a participant's practices or the context within which they operate (Bowen, 2009). Finally, documents can be examined as a way to confirm and verify findings or evidence from other data sources (Bowen, 2009). Combined with an in-depth interview, documents can be discussed with their creators so the researcher can learn what they contain and how they were created (Rubin & Rubin, 2012).

The documents collected from participants included unit/lesson plans, specific learning activities, classroom norms and procedures, grading rubrics, room decorations, school-wide growth mindset or digital literacy initiatives or policies, and assessment practices including types of feedback provided to students. Such documents are examples of primary sources which offer a "first-hand account" of the phenomenon or practice under study, without the need for evaluation to understand its intent (Frey, 2018). These documents were either created by the participating teachers or in cooperation with other teachers or school leaders. Participants provided copies of the documents during the interview or sent them via email as a follow-up to the interview.

Instrumentation

Survey Instrument

The survey instrument was used to identify participants for the qualitative phase of the study. The survey generated for the initial quantitative phase of research consisted of researcher-generated questions regarding participants' experiences with growth mindset, digital literacy instruction, the transition to remote learning, their willingness to participate in an interview, and their preference regarding the format (f2f or virtual) of the interview. Due to the intent and purpose of the survey, reliability tests were not required. However, the survey was reviewed by an expert panel and pilot tested by a group of high school teachers. Feedback from the review and pilot test were used to revise the survey to ensure it was ready for administration.

Each question on the survey was geared towards identifying participants for the qualitative interviews. The survey consisted of a Likert scale, a checklist, two yes-or-no responses, and open-ended, short-answer responses and takes approximately 5-10 minutes to complete (Teddlie & Tashakkori, 2009). School demographics, in the form of providing zip codes, were requested for the purpose of ensuring participants were chosen from diverse educational contexts. Although demographics are not relevant to the study of growth mindset, they are relevant to the study of digital literacy instruction as it relates to the digital divide. Certain demographic areas face unique challenges as it relates to the digital divide; therefore, it was important to identify potential interview participants from institutions situated in these demographic areas.

Interview Protocol

As mentioned, the qualitative phase of this research included in-depth, semi-structured interviews (Rubin & Rubin, 2012). The questions consisted of open-ended questions and were designed to elicit detailed descriptions of the teachers' instructional practices involving growth mindset and digital literacy as well as how those practices changed during the transition to remote learning. The open-ended nature of the interview protocol encouraged rich explanations, stories, and personal experiences and examples. The semi-structured nature of the interview protocol allowed for the addition of follow-up questions in order to provide teachers with an opportunity to further elaborate on their responses, provide clarification, share specific details related to their individual content or school districts, the types of professional development and training received, and questions about the document provided. Likewise, questions also included those to find out more about individual teachers, such as how long they had been teaching, whether they were tenured or non-tenured, and their level of education. The protocol consisted of ten questions which were created based on the elaboration needed from the case survey questions and responses.

In designing the interview protocol, I was sure to leave room for the flexibility and spontaneity consistent with the responsive interview approach. Therefore, my protocol acted as more of a guide than a checklist of questions to get through (Rubin & Rubin, 2012). In designing the protocol, I made sure to use language that would be familiar to my participants, specifically, words and phrases that are associated with growth mindset and digital literacy, were reminiscent of the survey questions, and were designed to encourage the participants to share their knowledge and experiences

regarding these topics (Rubin & Rubin, 2012). The main questions were developed using my own experience and knowledge as well as the literature (Rubin & Rubin, 2012). I ensured that the order of my questions were logical, meaning each question reasonably followed the one prior, and none of my questions would restrict what the participants shared further into the interview (Rubin & Rubin, 2012). Finally, I created tour questions which prompted respondents to provide broad and detailed descriptions of their practices and experiences, and in some cases, those of their organization (Rubin & Rubin, 2012). The relationship between the interview questions and the research questions is displayed in the following table.

Figure 1

Crosswalk: Research Questions, Interview Questions, and Document Review

Research Questions and Sub-Questions	Interview Questions	Document Review
RQ: What instructional practices are being implemented by high school teachers to promote a growth mindset among their students?	• How do you implement Growth Mindset into your lesson plans? • Describe some of the feedback you would provide to a student who does not show proficiency on a concept on his/her first try.	• How does the document promote the use of Growth Mindset? • Who created the document? • For whom/what purpose was the document created? • When was the document created?

Research Questions and Sub-Questions	Interview Questions	Document Review
Sub RQ: How are teachers' using instructional practices that promote growth mindset to improve students' digital literacy?	• In what ways do you incorporate growth mindset practices into your digital literacy skills instruction?	• What evidence does the document provide regarding the use of Growth Mindset practices in digital literacy instruction?
Sub RQ: How are growth mindset practices used to promote digital literacy in high schools located in privileged school districts different from those used to promote digital literacy in disadvantaged school districts?	• What types of Professional Development is offered by the school district to support teachers in promoting Growth Mindset in their teaching practices as well as providing direct digital literacy skills instruction?	• In what ways does the document reflect teachers' understanding of Growth Mindset and/or digital literacy instruction?

Research Questions and Sub-Questions	Interview Questions	Document Review
RQ: How have high school teachers' instructional practices that promote a growth mindset among their students evolved to accommodate the remote learning environment?	• How have your growth mindset practices changed since the transition to remote instruction? • What professional development or ongoing training was provided by your school district during the transition to remote learning?	• In what ways has the document been revised to accommodate the transition to remote learning?
Sub RQ: In what ways did the transition to remote instruction highlight the growing digital divide among high school students from low-socioeconomic backgrounds and their more advantaged peers?	• Tell me what you know about the digital divide. • How did your instructional practices support students' digital literacy skills/skill development during the transition to remote instruction?	• How does the document demonstrate how teachers provide feedback to students • How does the document demonstrate how teachers provide feedback to students regarding effort/motivation /persistence/help-seeking - especially when a student experiences failure?

Research Questions and Sub-Questions	Interview Questions	Document Review
Sub RQ: How have high school teachers used the transition to a remote learning environment to improve their instructional practices in order to address students' digital literacy needs?	• How did your instructional practices support students' digital literacy skills/skill development during the transition to remote instruction?	• How does the document demonstrate the ways in which teachers improved/increased digital literacy skills instruction during the transition to remote learning?

Document Review Instrument

The document review protocol was relatively simple and consisted of only five questions. These questions were generated to review how the document was used to foster growth mindset or digital literacy instruction in teachers daily instructional or classroom management practices. Similar to the interview protocol, this protocol was designed with the intent to further explore the responses to the survey as well as to provide evidence of the practices discussed by the participants.

Data Analysis

MMR data analysis involves processes which combines, connects, or integrates quantitative and qualitative data analysis strategies (Teddlie & Tashakkori, 2009). More

specifically, sequential MMR data analysis occurs when the quantitative and the qualitative strands of the study transpire in chronological order; specifically the analysis of one strand hinges on the preceding strand (Teddlie & Tashakkori, 2009). In this study, the initial quantitative strand was analyzed primarily to identify and select the interview participants. The interview transcripts and collected documents were coded, twice, in order to locate and identify themes emerging from the data. Finally, the quantitative and qualitative data were integrated in order to draw conclusions about how the qualitative data provided a further, more in-depth explanation about the quantitative data.

Survey Data

Data analysis began with the process of data cleaning in order to tidy up the data. This was done by proofreading the survey in order in to make decisions about and removing unclear responses, questions in which respondents provided more than the required number of responses, and any missing data resulting from a missed question or an unreturned survey (Punch, 2003; Creswell & Plano Clark, 2018; Fink, 2017). I then checked the variable names, variable labels, and value labels in order to improve them where necessary (Toepoel, 2016). I also recoded value labels where necessary. Finally, I reviewed the open-ended responses for illogical or personally identifying text and made corrections where necessary (Toepoel, 2016).

The survey for this study as mentioned above was used exclusively for the purpose of identifying participants for the qualitative interviews. The survey data was analyzed using descriptive statistics. Descriptive statistics include procedures that help researchers organize and describe data collected from a population (Frankfort-Nachmias & Leon-Guerrero, 2018). Moreover, data analysis using descriptive statistics makes it

easier to triangulate the quantitative data to the qualitative data. One simplistic way to

organize data is to classify it into a frequency distribution. A frequency distribution is a

data table that organizes the number of survey responses that fall within a specific

category of a variable being analyzed and is typically a first step in data analysis

(Frankfort-Nachmias & Leon- Guerrero, 2018). When the number of cases is large,

frequencies can be difficult to organize; therefore, in order to systematize the frequencies

they can be translated into "relative frequencies," such as a proportion or a percentage

(Frankfort-Nachmias & Leon- Guerrero, 2018, p. 24).

These relative frequencies identify which portion of the survey population fall

within each category under study, making it easier to identify which survey participants

to invite to participate in the qualitative phase in this study. Specifically, data from the

survey was analyzed in order to identify which participants use growth mindset in their

instructional practices, teach digital literacy skills, experienced teaching in a remote

learning environment, as well as where the high school in which they teach is located.

This data was necessary for the selection of interview participants; therefore, generating

frequency distributions and relative frequencies made it easier to isolate and select those

participates.

Interview Data

Qualitative data analysis is the exploration of various forms of narrative data,

such as interview data and document review data - more specifically, any kind of non-

numerical data (Teddlie & Tashakkori, 2009). A frequently used and customary

procedure for qualitative data analysis is thematic analysis (Nishishiba et al., 2014). This

approach generates themes that adequately illustrate the data. Nishishiba et al. (2014)

define themes as "key patterns identified in the data that may be important features of the phenomenon in question," (p. 286) based on the goals of the research question(s). The researcher discovers these themes by engaging in multiple evaluations of the data using codes, or labels that highlight recurring patterns (Nishishiba et al., 2014). Saldaña (2016) further defines codes as a word or short phrase that "symbolically assigns a summative, salient, essence-capturing, and or evocative attribute" to verbal or visual data (p. 4). Codes are researcher-generated in order to decode data (Vogt et al., 2014) and attribute these interpretations to each datum for detecting patterns, creating categories, developing assertions, or other analytical processes (Saldaña, 2016).

The recorded interviews were transformed into audio files and transcribed using Otter A.I. a transcription and data analysis software. The transcripts were checked for accuracy through several thorough readings, including reading a long while listening to the audio recording of the interview and making any necessary revisions. During this review process, initial thoughts, observations, and ideas were recorded in the margins of the transcribed interviews and collected documents as a first step in developing the thematic categories and codes (Creswell & Plano Clark, 2018). Likewise, the transcriptions were provided to the participants for verification of accuracy of the recorded and transcribed interview data.

Two cycles of coding were used for the data collected during the qualitative phase of this study. Provisional coding was used as the first cycle of coding in order to establish a "predetermined start list of codes" (Saldaña, 2016, p. 168). These codes were developed in anticipation of specific categories and types of responses that were expected to emerge in the collected data (Saldaña, 2016). The provisional list of codes was generated from

the initial research, including the literature review, the research questions, and the researcher's prior knowledge and experience (Saldaña, 2016). As the qualitative data were collected and analyzed, the provisional codes were amended, changed, removed, and further developed to include new codes. Miles et al (2014) recommends that the initial list should contain anywhere from 12 to 60 codes. Creswell (2013) on the other hand, recommends a much shorter list of "lean codes," (pp. 184-185) including only five to six before data collection begins, and no more than 25 to 30 as data collection commences. All of the codes are then combined into five or six major themes (Creswell, 2013). Since there are several common underlying concepts and ideas related to growth mindset and several specific strategies and methods for teaching digital literacy, creating a list of provisional codes which were checked for relevance after collecting the data, proved to be quite helpful in continuing to define the codes and eventual themes through continued interaction with the data (Dey, 1993).

In the second cycle of coding, focused coding was used. Focused coding seeks out the recurring or exceptional codes in order to develop the most essential categories in the data collection (Saldaña, 2016). Charmaz (2014) adds that focused coding requires the researcher to make "decisions about which initial codes make the most analytic sense" (p. 138). This coding method worked well with the provisional coding list and subsequent revision of that list after initial data analysis. The provisional codes were reanalyzed using focused coding in order organize the data into categories and subcategories. Such organization made the data easier to manage, to identify the most salient data categories, and to look for relationships within the data so that themes could be created (Rubin & Rubin, 2012). Similar to provisional coding, data could not be forced or selected to fit

pre-conceived or pre-existent categories (Glaser, 1978). Instead I kept an open mind in both first and second cycle coding as more data was encountered, more categories were defined with greater accuracy and focus (Dey, 1993).

Document Review

According to Altheide and Schneider (2013), qualitative document analysis depends on the researcher's interaction and involvement with relevant documents chosen for their applicability to the research topic (p. 40). Document analysis is often used in combination with other qualitative research methods as a means of triangulation—"the combination of methodologies in the study of the same phenomenon" (Denzin, 1970, p. 291). The qualitative researcher is expected to draw upon multiple sources of evidence; that is, to seek convergence and corroboration through the use of different data sources and methods. Apart from documents, such sources include interviews, participant or non-participant observation, and physical artifacts (Yin, 1994). A document protocol was created to help analyze the collected documents. Similar to the interview questions, the questions created were open-ended and sought information pertaining to the creation of the document; any revision of the document; and how the document promotes the use of growth mindset practices. Each document was put through the same two cycles of coding – Provisional coding and Focused coding – that were used to code the interview transcripts and were evaluated for concepts and possible themes consistent with those uncovered in the interview data.

Comparing the Data

Coding is not simply a process which allows a researcher to prepare data for analysis, it is a process that drives both ongoing data collection and continued data

analysis. It fosters a continual reshaping of perspectives and the instrumentation for each

consecutive round in the analysis process (Miles et al., 2014). To that end, it is important

that each cycle of coding be strategically implemented in order to foster a comparison of

the data for continued analysis and description. Narrative descriptions and visual displays

are ways in which the data can be analyzed using fresh perspectives. Narrative

descriptions provide a narrative, or story, detailing what the collected data suggests

(Miles et al., 2014). Visual displays, on the other hand, provide a graphic representation

of the data. For example, a matrix display is a chart or table that condenses the data into

an "at-a-glance" format useful for contemplation, corroboration, drawing conclusions,

and other types of analyses (Miles et al., 2014, p. 91). A network display shows how a

process, a relationship, an organization, or other relevant aspects change over time (Miles

et al., 2014).

For the purpose of this study, I organized the data into a Matrix display and

conducted a cross-case comparative analysis. This type of analysis enhances

"generalizability or transferability to other contexts" as well as deepens "understanding

and explanation" of the phenomenon under investigation (Miles et al., 2014, p. 101). It

allows for a closer investigation into the significance and inter-related nature of findings

to other settings with similar characteristics and allows the data to transcend a particular

case in order to provide a more general understanding of an idea or concept (Miles et al.,

2014). Furthermore, such a comparison helps the researcher to identify negative cases

through the examination of similarities and differences across multiple cases (Miles et al.,

2014). Using a case-oriented approach, I analyzed each case as a complete, independent

entity, looking at specific arrangements, relationships, causes, and effects within the case,

only then turning to a comparative analysis of other cases looking for similarities, differences, and more generalized explanations (Miles et al., 2014). This information was organized using a two-variable case-ordered matrix allowing for the exploration of interrelationships among cases ordered by well-known variables along each row and lesser-known variables across each column (Miles et al., 2014).

Most of the tenets of growth mindset are pretty standard and consistent; however, the ways in which those tenets are operationalized in teachers' classroom practices are often very diverse based on the needs, ages, and experiences of the students. Since the participants included teachers of various content areas from numerous districts serving diverse student populations, such comparisons were necessary in order to identify relationships between growth mindset practices in different content areas and among differing groups of students. Similarly, as the goals of digital literacy instruction are quite consistent, it was important to compare how digital literacy skills are taught to students across different content areas and within different educational contexts. Finally, it was important to understand how growth mindset practices are being used to teach digital literacy skills and to make comparisons between teachers' practices and educational environments. Therefore, a case-oriented approach using a two-variable, case-ordered matrix was most suitable for analyzing and comparing the collected data.

Integration of Data

Integration of data is paramount to an MMR design (Creswell & Plano Clark, 2018). Likewise, integration differs based in the type of MMR design employed. Moreover, integrating, or mixing the data can occur at any point during the mixed methods study (Creswell & Plano Clark, 2018). In an explanatory sequential MMR

design, the quantitative data are used to design the qualitative phase. For this MMR study, the purpose of the quantitative data was to identify the participants for the qualitative phase of the study using the case selection variant design (Creswell & Plano Clark, 2018). Creswell and Plano Clark (2018) explain that a strong association between the phases allows the researcher achieve more meaningful explanations. The qualitative phase was used to further explore the data generated in the quantitative phase; specifically, participants were interviewed in order to develop deeper understandings about growth mindset practices and digital literacy instruction. Likewise the collected documents were analyzed to provide additional evidence for the participants' professed growth mindset practices and digital literacy instruction both during the quantitative phase and the qualitative phase. Furthermore, the qualitative data provided additional insight in how participants' growth mindset practices changed as a result of the transition to remote instruction. Finally, since the quantitative phase also identified teachers who do not use growth mindset practices or provide digital literacy instruction, the qualitative phase of the research offered helpful strategies these teachers can adopt into their own teaching practices.

Legitimation

Validity threats, specific to each particular research method, exist for every researcher regardless of their study. Indeed MMR combines both quantitative and qualitative strands in order to balance both the strengths and weaknesses of each individual strand, yet there remains a need to address the types of validity checks associated with each of the individual strands (Creswell & Plano Clark, 2018). Onwuegbuzie and Johnson (2006) further add that because mixed methods research

involves integrating the "complementary strengths and nonoverlapping weaknesses" of each research strand, appraising the validity of findings thus becomes rather complex, making this a "problem of integration" (p. 48). They refer to validity in mixed methods research as legitimation, which incorporates both the validity measures of quantitative and qualitative strands (Onwuegbuzie & Johnson, 2006). Problems with legitimation in research refers to the complicated nature of procuring findings which are "credible, trustworthy, dependable, transferable, and/or confirmable" (Onwuegbuzie & Johnson, 2006, p. 52). Such problems are exaggerated in MMR designs due to the individual problems inherent in quantitative and qualitative approaches which yield an "additive or multiplicative threat" (Onwuegbuzie & Johnson, 2006, p. 52).

Creswell and Plano Clark (2018) explain that because each mixed methods design has its own logic and an intent to produce inferences, the types of validity threats vary among the different types of mixed methods design. For the explanatory sequential design, these validity threats include a failure to identify and explain critical quantitative results, ignoring unforeseen or inconsistent quantitative results with the qualitative data, and not providing a connection between the initial quantitative results and the follow-up qualitative data (Creswell & Plano Clark, 2018). Therefore, Onwuegbuzie and Johnson (2006) suggest legitimation strategies that are specific to MMR. One such strategy is referred to as "weakness minimization legitimation" (p. 57) and it involves determining how the weaknesses from one strand can be offset by the strengths of the other strand, and designing the study with this intent (Onwuegbuzie & Johnson, 2006). Therefore, the quantitative phase of this research was designed for the sole purpose of identifying

participants for the qualitative phase of the research in order to produce strong, legitimate results.

In the quantitative phase of research, validity refers to the degree to which measures reveal what they are intended to measure (Frankfort-Nachmias & Leon-Guerrero, 2018). As mentioned previously, the survey was researcher-generated. However, since the reason for the creation and distribution of the survey in this study was to find interview participants, statistical tests for validity and reliability were not necessary. Instead, the true test of validity of the quantitative phase came from the identification of interview participants and the rich data generated during those interviews.

In qualitative research, Lincoln and Guba (1985) explain that data trustworthiness stems from transferability, dependability, confirmability, and credibility. Transferability refers to data which substantiate the generalization of findings across multiple contexts, such as different participants, groups, and circumstances (Suter, 2012). Transferability is strengthened when comprehensive descriptions are provided which allow judgments to be made about a similarities within other contexts. Furthermore, when comparisons across cases and units of analysis yield related findings, it also increases transferability (Suter, 2012). Similar to reliability in quantitative research, dependability suggests that similar findings would be achieved if a similar study were replicated. Dependability is often enhanced by customary qualitative strategies, such as rich documentation and triangulation, as well as interrater reliability and code-recode stability (Suter, 2012). Confirmability speaks to the management of researcher bias. Although bias in qualitative research is inevitable, unbiased interpretations can occur if the researcher engages in self-

reflection, factoring the bias into the design while deliberately keeping an open mind about what may be uncovered during qualitative research. Confirmability is also improved by uncovering similarities to quantitative research findings that led to similar conclusions (Suter, 2012). Finally, credibility, which is an "overarching criterion for judging the trustworthiness of qualitative data" (Suter, 2012, p. 365) refers to the credibility of the findings which is improved by evidence such as having the research participants verify and evaluate conclusions, triangulate multiple data sources, recognize and manage undesirable influences, and establishing a theoretical fit (Suter, 2012).

The qualitative data generated by this study meets these criteria. Transferability was found in the comparison among high school teachers from different high schools across NJ as well as comparisons among high school teachers who teach within different content areas. Dependability was enhanced by the rich documentation (i.e. interview and document collection), data saturation, and the triangulation of all the data sources (survey data, interview data, and collected documents). Confirmability was established by identification of researcher bias as well as the similarities between this and other studies. Finally, this study demonstrated credibility by putting the data through two cycles of coding, presenting the data through tables and excerpts of interview data, and allowing participants to review and verify the interview data.

Role of Researcher

One of the distinctive features of qualitative research is the actual role of researcher within qualitative inquiry. Denzin & Lincoln (2005) explain that qualitative research is unlike quantitative forms of research which seek individual realities through objective examination; instead, qualitative research positions the spectator in the world of

research and acknowledges that a relationship exists between the researcher and the participants (Ormston, et al., 2014). As a researcher, I was the instrument of data collection. While I interviewed, collected documents, and recorded data, I also modified the observation, interview, and recording devices from one participant to the next - a common outcome occurring as researchers learn more from each participant (Miles et al., 2014). Thus it was important to ensure that I was familiar with the phenomenon being investigated (i.e. growth mindset) as well as the settings (high schools in NJ) and participants (high school teachers) for these observations (Miles et al., 2014). The matter of researcher membership in the group or context being investigated is applicable to all research methodology, including MMR, since the researcher holds an explicit and personal role in both data collection and analysis" (Dwyer & Buckle, 2009). The researcher's role as an insider-researcher, having the quality, position, or experience under investigation in common with the participants, or as an outsider-researcher, sharing no commonality with the participants, nevertheless is an ongoing and vital facet of the research study (Dwyer & Buckle, 2009). Insider research refers to research among populations within which the researcher is also a member (Kanuha, 2000). As a member of the high school teaching community, *I* share a similar identity, a common language, and several general experiences with the study participants (Asselin, 2003). In fact, I work in the same setting as some of the participants. The complete insider research membership provides researchers with a sense of authority, but may also include stigma related to *the* participant group (Adler & Adler, 1987). Nevertheless, I embraced the role status of insider role which allowed a more complete acceptance by the participants

within a shorter period of time, encouraged participants to be more open, and allowed for profundity in the data collected (Dwyer & Buckle, 2009).

As with any role in research, there are strengths and weaknesses to being an insider researcher. The primary benefit to being an insider researcher is the acceptance the researcher receives from being part of the group. The researcher's membership provides an increased measure of trust and openness among participants that would have been absent otherwise. Participants are often more willing and eager to share their personal experiences due to an understanding of shared characteristics; the researcher is viewed as one who understands while outsider researchers as viewed as incapable of understanding (Dwyer & Buckle, 2009). Contrarily, although the shared status provides easier access and a common framework from which to commence research, this insider membership has the potential to hinder the research process as it progresses.

Participants may overestimate the similarity and familiarity the researcher has with the phenomenon under study, and may therefore fail to provide a thorough explanation of their experiences. Additionally, the researcher may confuse their own ideas and personal experiences with that of the participants, resulting in interviews shaped by the researcher's experience, not the participant's (Dwyer & Buckle, 2009). Furthermore, this influence might impact the validity of the analysis, resulting in an over-emphasis on shared factors between the researcher and the participants and a de-emphasis on factors that diverse or contradictory (Dwyer & Buckle, 2009). Therefore, recognizing my insider researcher role, I carefully used my interview protocol during each interview, keeping it open for follow-up questions that allowed me to ask for clarification and additional details rather than making assumptions about what the participants were

sharing. Moreover, I sought research participants who worked in school districts that are different from my own as well as those who taught various content areas. This allowed me an opportunity to be, at least in some respects, an outsider researcher.

Ethical Considerations

Prior to conducting research in the field, it was necessary to apply for Institutional Review Board (IRB) approval. The Belmont Report (1979) provided guidelines to ensure ethical considerations were provided to each participant as well as to the institutions to which they belonged. These guidelines include respect for persons, beneficence, and justice. Since I would know the identities of my participants, anonymity was not possible; however, I ensured confidentiality by referring to participants, who volunteered to participate in the second phase of the research study, and to their institutions using pseudonyms chosen by the participants. Participants legal names and contact information were stored in a password protected zipped file located in a hard-drive only accessible to me. Likewise, audio recordings and the related transcripts were stored in a password protected file.

Beginning with informed consent at the initiation of the quantitative phase, participants were provided with multi-stage consent for each new phase of data collection to ensure their continued willingness to participate in the research project. Within my own institution, I was required to get permission from the superintendent in order to send the survey to the teachers at the high school. Additionally, participants were ensured that participation was voluntary, that interviews would be recorded and transcribed, they would have the opportunity to review the transcriptions, and they were informed that they could withdraw from the study at any time. Likewise, participants could omit answering

any of the survey questions, interview questions, or decline to provide a document for review.

While there were no immediate benefits (i.e. incentives) to the participants of this study, there were several ancillary benefits to participation. First, participants in this study were able to share their knowledge about growth mindset, as well as their individual instructional practices which incorporate these models. Such contribution can help to inspire and improve the instructional practices of other teachers, both novice and veteran, with the potential benefit of improving the educational experiences for students. Second, participants in this study were able to share their expertise relating to digital literacy instruction and how incorporate digital literacy in classroom practices. This expertise can be used by other teachers as they work to improve their own digital literacy instruction, specifically those working in disadvantaged educational settings, thereby improving their students' digital literacy skills and beginning to narrow the digital divide. Third, as this study also looked at the transition to remote learning, the participants' shared experiences can help to inform future practice for continued or recurrent remote instructional practices. There were no anticipated risks to the participants of this study.

Chapter 4

Context of Study

The purpose of this explanatory sequential mixed methods study was to explore the ways in which high school teachers use instructional practices that promote a growth mindset among their students, how those practices are used to improve digital literacy, and how those practices evolved during the transition from face-to-face instruction to remote instruction. Remote instruction introduced several new challenges to learning, ranging from limited access to devices and the Internet to a considerable deficit in digital literacy skills, often resulting in a disengagement from the educational environment. Consequently, this study aimed to explore not only how teachers are using instructional strategies that promote growth mindset, but how those strategies are expressly executed to improve students' digital literacy skills.

Because much greater emphasis was placed on the second, qualitative phase of the research, the case-selection variant of the explanatory sequential mixed methods design was used. Preliminary quantitative data was collected using a cross-sectional survey to identify and select participants to interview (Creswell & Plano Clark, 2018; Punch, 2013). The survey, which elicited 462 responses from high school teachers in New Jersey, generated data that was analyzed for beliefs about growth mindset, instructional practices involving digital literacy, engagement in remote instruction, and willingness to participate in the qualitative interview.

Using the quantitative data, willing respondents were further solicited to participate in the qualitative interview. From a total of 139 volunteers, 46 respondents met the criteria, and 26 respondents were chosen to participate in an in-depth, semi-

structured interview, further exploring their experiences using growth mindset, providing digital literacy instruction, and engaging in remote instruction. Likewise, participants provided information about the professional development offered by their school districts that provide support for growth mindset practices, digital literacy practices, and the transition to remote learning. Finally, participants shared their knowledge about the digital divide, including their understanding of what it is and how their school districts respond to it, especially during remote instruction.

This chapter provides an overview of the findings resulting from analysis of quantitative survey data, qualitative interviews, and the documents collected from participants. This overview provides a transition to Chapters Five and Six, which were composed as manuscripts to be submitted for publication.

Changes in the Field

The quantitative sample, as mentioned above, included teachers from public high schools throughout New Jersey. While it was my intent to reach every high school teacher in New Jersey, there was no guarantee that every teacher would respond to the survey; based on the responses received, it is unlikely I met this goal. Nevertheless, despite some minor adjustments, my survey was made available to secondary school teachers in at least 13 counties across New Jersey. Furthermore, the New Jersey Education Association (NJEA) provided a link to my survey on their Facebook and Twitter social media platforms, which had the potential to reach approximately 80,000 followers. While some of these followers are likely teachers of all grade levels, I am confident that such an outreach made my survey available to high school teachers in every county across the state.

To reach the vast population of secondary teachers in New Jersey, it was necessary to use a multistage survey distribution approach as a single list of the focus population was unavailable (Fowler, 2014). Using this approach, I attempted to contact the offices of the county superintendents throughout New Jersey in order to identify the number of high schools and high school teachers in each county; however, this approach yielded no results. Next, I contacted county and district union representatives and asked for their assistance in sharing my survey with the high school teachers in their local associations. I also contacted the New Jersey Principals and Supervisors Association (NJPSA) to facilitate contact with high school administrators to ask for assistance in disseminating my survey. This proved ineffective as many school administrators believed that they needed board approval to share my survey. However, from this contact, I was able to access a database that listed all schools throughout New Jersey that provided contact information for individual teachers at every high school with which to share my survey. From this large sample, I was able to secure interviews with 26 high school teachers for the qualitative phase of my research. One participant shared that he was a high school teacher in a private school; therefore, data collected from this participant was not included in the results as it was outside the scope of the study.

Although each interview participant was offered the opportunity to participate in a face-to-face interview at a location of their choosing, every participant chose the option of participating online using the WebEx platform. Despite some of the drawbacks of an online interview setting, such as difficulty in developing rapport or recognizing non-verbal cues, most participants left their cameras on during the interview, which allowed for a more personalized interview experience similar to that of a face to face interview.

Participants were still able to choose their own setting, which added to their comfort level. Likewise, being on screen provided me with an opportunity to observe the participants' non-verbal communication. Finally, as a fellow high school teacher, I was able to develop rapport with each participant despite being in separate physical settings.

Finally, two changes were made respecting the research questions that guided this research. Research Sub-question number two was modified slightly, and now asks: How are instructional practices used to promote digital literacy in high schools located in privileged school districts different from those used to promote digital literacy in disadvantaged school districts? Additionally, a fifth question was also added, which asks: *How do teachers perceive the digital divide and its effects on students and the transition to remote instruction?*

Participants

The twenty-five participants in this study were all public high school teachers. Each participant was provided with a pseudonym - either self-chosen or assigned - for the purposes of confidentiality. Table 1 lists each participant, the content area they teach, the county in which their high school is located, the percentage of high school students living in poverty, and the percentage of high school students who qualify for free and reduced lunch.

Table 1

Participants and High School Demographics

Participants	Subject	County	Poverty	Free Lunch	Reduced Lunch
Gail	Speech & Language Pathologist	Sussex	16%	16%	7%
Adam	Automotive Technology	Camden	50.20%	46%	12%
Sorina	Special Education	Cumberland	62.80%	44%	6%
Cal	Science	Camden	76.30%	72%	33%
Ella	Math	Mercer	N: 6% S: 4.4%	4% 3%	2% 2%
Marie	Authentic Science Research	Ocean	N: 25.7% S: 24.2%	21% 23%	5% 5%
Tina	Math	Atlantic	50.10%	40%	12%
Duane	Science	Camden	10.60%	9%	4%
Lionel	AP Seminar/AP Research	Bergen	8.30%	6%	3%
Kent	Science	Camden	38.80%	31%	8%
Hortense G. Abilone	Math	Ocean	20.90%	59%	12%
Mica	History/Government and Politics	Bergen	32.60%	24%	10%

Participants	Subject	County	Poverty	Free Lunch	Reduced Lunch
Job	Financial Literacy	Monmouth	38.90%	36%	12%
Stefi	STEAM	Monmouth	20.70%	21%	5%
Kasey	Science	Ocean	7.80%	5%	4%
Leslie	Special Education	Mercer	42.70%	32%	8%
Donna	Math	Atlantic	53%	50%	7%
Liam	Science	Atlantic	57.70%	53%	9%
Cameron	Economics/Philosophy	Passaic	53.20%	49%	7%
Vanesa	Photography	Passaic	28.70%	24%	8%
Rian	Science	Essex	40.50%	38%	9%
Ramen	English	Mercer	17.70%	11%	3%
MthIsCool	Math	Burlington	50%	43%	10%
Sam	Spanish	Camden	13.80%	6%	2%
Bettie	English/AP Psychology	Ocean	7.80%	5%	4%

Interviews

Participants were interviewed via the virtual format of WebEx. The interview

protocol included ten in-depth semi-structured interview questions aligned with the

research question and sub-questions. Responsive interviewing was used to offer flexible questioning that, although semi-structured, allowed for adjustment and additional questions during each individual interview. This assisted in creating a discussion guided by the personal perspectives of the participants and led to a firm understanding of the phenomenon being studied (Rubin & Rubin, 2012). Several participants also submitted documents providing a more comprehensive analysis about teachers' instructional practices that promote a growth mindset and digital literacy.

Discussion of Findings

The following findings were the results of the analyses of the quantitative survey data, the qualitative interview data, the document review, and the mixed methods analysis of these combined data,

Quantitative Findings

The findings from the quantitative survey data analyses were used to address the first two research questions in this study. In order to guarantee a heterogeneous sample of participants, including teachers from various content areas across New Jersey, it was necessary to collect a large amount of data. Likewise, since the participants would be chosen for the qualitative phase based upon their responses to the quantitative survey, I needed a large pool of participants from which to choose to guarantee enough participants were eligible to be interviewed. A total of 474 participants responded to the survey. The findings for these questions are discussed below.

Research Question 1

How many high school teachers, who responded to the survey, promote a growth mindset in their learning environment? To address the first research question, variables

included the first five questions of the survey which asked respondents whether they agreed or disagreed with a list of growth mindset beliefs. The questions measured teachers' beliefs about intelligence, the effectiveness of effort, hard work and positive learning strategies, and the positive effects of failure. Descriptive statistics in the form of a frequency distribution (Table 2) were used to summarize the data into frequencies and percentages to gain insight into how many teachers promote a growth mindset into their learning environments.

Table 2

Growth Mindset Beliefs

Questions	n	f	%
An individual's intelligence is malleable	386		
Agree		357	92.5%
Disagree		29	7.5%
Students can become more intelligent through commitment, effort, and/or hard work	386		
Agree		354	91.7%
Disagree		32	8.3%
Students can become more intelligent through the use of positive learning strategies	385		
Agree		359	93.2%
Disagree		26	6.8%
Students can become more intelligent through help from others when needed	386		
Agree		355	92%
Disagree		31	8%
Failure can be used to help students grow and learn	387		
Agree		362	93.5%
Disagree		25	6.5%

The frequencies and percentages show clearly that a greater number of teacher respondents agree with the beliefs pertaining to a growth mindset. Therefore, based on the frequencies and percentages of teachers who agree with listed beliefs pertaining to growth mindset, it can be concluded that 93% of the teachers who responded to the survey promote at least one growth mindset belief in their learning environment.

Research Question 2

How many high school teachers, who responded to the survey, incorporate digital literacy instruction in their instructional practices? To address the second question, variables were included from question six, which consisted of a checklist of digital literacy instructional practices. Among other practices, the questions measured the integration of technology into one's content area and grade level, the use of digital tools, the integration of technology into lessons and activities, the use of technology in differentiated instruction, the use of technology for assessment, and the use of technology for online learning. Once again, descriptive statistics in the form of a frequency distribution (Table 3) were used to summarize the data into frequencies and percentages to analyze how many teachers use specific digital literacy instructional practices.

Table 3

Digital Literacy Instructional Practices

Questions	f	%
Integrate technology into the curriculum of one's subject and/or grade level	342	72.2%
Did not select/Respond	132	27.8%
Use digital and online tools to create/distribute classroom materials	345	72.8%
Did not select/Respond	129	27.2%
Design and develop lessons and activities that integrate technology	333	70.3%

Questions	f	%
Did not select/Respond	141	29.7%
Use appropriate technology to differentiate instruction for all learner	297	62.7%
Did not select/Respond	177	37.3%
Manage student technology activities to optimize learning with available resources	279	58.9%
Did not select/Respond	195	41.1%
Integrate results of electronic research into classroom instruction with proper citations as appropriate to the grade level	191	40.3%
Did not select/Respond	283	59.7%
Facilitate technology-enhanced lessons that address student technology literacy standard	241	50.8%
Did not select/Respond	233	49.2%
Assess student learning using a variety of district, school or individual technology tools/ strategies	294	62%
Did not select/Respond	180	38%
Use electronic communication tools to enhance teaching and learning	330	69.6%
Did not select/Respond	144	30.4%
Explain and correctly use terms related to online learning	274	57.8%
Did not select/Respond	200	42.2%
Facilitate student use of online tools to gather and share information collaboratively	281	59.3%
Did not select/Respond	193	40.7%
Locate and participate in appropriate technology professional development activities	263	55.5%
Did not select/Respond	211	44.5%

The frequencies and percentages demonstrate that most of the teacher respondents

(>50%) implement at least eleven of the listed digital literacy instructional practices.

Therefore, it can be concluded that 72% of the teachers who responded to the survey incorporate at least one digital literacy instructional practice in their teaching practices.

Although each of these frequency distributions provided a baseline for choosing respondents to participate in the qualitative interviews, additional descriptive statistics in the form of frequency distributions were used to summarize the data into frequencies and percentages to determine additional selection criteria, including respondents' participation in remote instruction as a result of the COVID-19 outbreak (Table 4) and their willingness to participate in the interview (Table 5).

Table 4

Remote Instruction During COVID-19

Question	n	f	%
Facilitated remote instruction during COVID-19 Outbreak	354		
Yes		342	96.6%
No		12	3.4%

Table 5

Interview Participation

Question	n	f	%
Willing to Participate in an Interview	352		
Yes		139	39.5%
No		213	60.5%

Table 4 highlights the frequencies and percentages of the respondents who continued to meet the criteria for the qualitative interviews; however, Table 5 highlights the frequencies and percentages of the respondents who were actually willing to be

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interviewed. This provided me with a more accurate baseline of participants for the final screening and selection process. The 139 willing participants were further vetted based on their responses to survey items 1-6, and item 7. It was determined that many of the participants, although willing to be interviewed, did not meet the criteria to participate in the qualitative phase of the study. Specifically, many of the participants did not answer "Agree" or "Strongly Agree" to all of the questions pertaining to growth mindset beliefs or did not select a majority of the digital literacy practices. Based on this final screening, I invited 46 respondents to interview; from this much more narrowed pool, 26 participants were interviewed in the qualitative phase of the research.

Qualitative Findings

The findings from the qualitative interviews were used to address the remaining research questions and sub-questions in this study. The findings for these questions are discussed below.

Research Question 3

What instructional practices are being implemented by high school teachers to promote a growth mindset among their students? Instructional practices that promote a growth mindset communicate the idea that intelligence is malleable, reinforce the idea that mistakes and failure are the pathways to learning, view challenges as opportunities to improve, and value the process of learning through effort and hard work. Using such practices, teachers provide encouragement to students to help students persevere by providing meaningful feedback and encouraging effort. The following themes highlight the diverse instructional approaches implemented by the study participants, providing an answer to the research question.

Theme 1: Nothing Succeeds Like Success. Students feel successful when they succeed. Thus, the participants recognized the importance of providing learning opportunities for them to find success. This theme came directly from one teacher who explained a "truism," she stands by after more than 30 years in the classroom: "Nothing succeeds like success" (Hortense). Teachers acknowledged that in order for students to want to keep learning and to embrace challenges, they need to know they have the ability to do so. Participants discussed how providing students with opportunities to use their knowledge as they learned new material, was one way to help students feel successful. Likewise, teachers gave students opportunities to reflect on all they are learning as another way for them to experience success. Furthermore, they extended students extra help to solve problems, work through challenges, and help them succeed. As one teacher highlighted, "Extra Help is a valuable one. It's more traditional, but it's useful, very valuable. It gets a lot of bang for the buck" (Rian). Finally, teachers provided students with the opportunity to engage in the learning process by simply doing the work to experience the success of learning something new. Such practices promote a growth mindset as the teachers celebrated their students' success encouraging their students to continue to seek more opportunities that would lead to more success and continued learning.

Theme 2: Mistakes are the Evidence of Trying Something New. Because making mistakes can be scary and even cause students to feel defeated, teachers communicated the importance of providing opportunities for students to make mistakes in an environment of support and encouragement. The participants explained students need to understand that when they make mistakes, it actually means that they are trying

something new - that they are stepping outside their comfort zone and exploring new opportunities and challenges. Some teachers posted signs in their classroom that promoted working through mistakes and continuing to put forth effort. These signs encouraged students to change the way they thought about failure and to always remember to add the word, "yet," when they struggled to learn something new or difficult. Teachers expressed awareness that such ideas reminded students that learning is a process, and they would be successful if they kept encouraging themselves to try. The participants demonstrated a growth mindset by creating these opportunities for students to make embrace failure in an atmosphere that rewarded risk-taking and allowed students to work through and learn from their inevitable mistakes.

Theme 3: Wrong is Not the End Result. The participants explained that similar to making mistakes, getting something wrong should not be a final result. Thus, the teachers gave students opportunities to correct errors, re-do assignments, or simply assisted students in finding a way to the correct answer. For example, one teacher used a "no opt-out" questioning strategy to help students get to the correct answer (Cameron). He explained that students must at least attempt an answer to a question, and wrong answers are acceptable and encouraged as it engaged students in a conversation and helped them get to the correct answer. Teachers understood that these strategies encouraged a higher level of participation because students felt confident that wrong answers would eventually lead to the correct answers. The participants elaborated on other strategies, such as allowing longer wait times, asking clarifying questions, and providing opportunities for students to collaborate as practices that gave students opportunities to work through the wrong answers to get to the correct answers. Likewise,

teachers' classroom decorations included inspiring messages that not only normalized mistakes, but also encouraged students to work through them. For example, one teacher's sign: "It's not that I'm so smart; it's just that I stay with problems longer," encouraged students to persevere through difficulties and obstacles (Tina). The teachers worked to create an environment in which wrong answers were part of the learning process to get to the right answer. The participants employed growth mindset in their teaching practices by emphasizing the process of effort over ability and highlighting the idea that sometimes things would be challenging.

Theme 4: Knowledge is Constructed in the Mindset. The participants shared how their practices gave students opportunities to construct their own knowledge and make meaning about the material being presented to them. This involved giving them opportunities to interact and engage with the material. Such practices also involved using real-world scenarios which required students to connect the concepts learned in class to a situation they may encounter in the real-world. Likewise, when constructing new knowledge, teachers provided scaffolded lessons and helped students reach new levels of understanding the material based on where they were in the learning process. Teaching practices that incorporated direct instruction/modeling, guided practice, and independent practice were also helpful in allowing students to construct new learning. Many teachers introduced new concepts, practiced with students, and then gave them an opportunity to practice independently. The participants noted that it was beneficial to each student's success when they recognized who needed additional support in their learning and allowed other students to move at a pace more conducive to their own success. When teachers convey messages that competencies and abilities are works in progress, students

can be encouraged to continue developing their individual capacities as well as a growth

mindset.

Theme 5: The End Game is Learning. Regardless of what grade students earn,

how long it takes them to learn the material, or how many times they have to correct the

same assignment, the teachers upheld that the ultimate goal for students was learning.

Similar to the first theme, this theme was a quote from a teacher who told his students,

"The end game is knowledge. The end game is coming out of the class with skills that

you can apply" (MthIsCool). Therefore, it did not matter if students liked the content area

or if they were the highest achiever, teachers' practices assured that students learned the

skills that could be applied later and ensured that students reached the goal of learning.

Teachers also gave students assessments to evaluate what their students have learned.

While summative assessments provided data about what students learned, formative

assessments, given at multiple points throughout a learning unit were excellent tools to

both assess students' learning and provide real-time data that were used to guide and

inform instruction. Because of the greater utility, many teachers used formative

assessments to re-teach material, provide students with additional practice, and help

students move forward in their learning. Project-based learning was another means

through which teachers engaged students in the process of learning. Through the use of

hands-on and creative projects, teachers gave students the opportunity to solidify new

content through active participation in the process of creating new knowledge. Such

instructional practices foster growth a mindset since they focus more on the process of

successful learning and highlight how individuals use effort and hard work in order to

succeed.

Research Sub Question 1

How are teachers' using instructional practices that promote growth mindset to improve students' digital literacy? Digital literacy skills are the abilities students use to find, understand, and use digital tools (Nichols & LeBlanc, 2020). Specifically, digital literacy focuses on how students use digital technologies to find, analyze, and communicate information in a variety of digital formats and mediums. The transition to remote learning has made digital literacy skills instruction as well as the ability to use digital technology to teach students educational content a top priority in education. The following themes highlight the diverse instructional approaches that promote growth mindset participants used to improve students' digital literacy skills, providing an answer to the research question.

Theme #6: Growing Digital Mindsets. Because of the wide array of skills students need to be digitally literate as they engage in using a plethora of educational technology and instructional platforms, students need ample instruction and practice to become proficient. Incorporating instructional strategies that promote a growth mindset requires that one foster success through the mastery of teachable fundamentals (Dweck, 2007). Therefore, the participants took the time to ensure that students learned the various digital platforms and media to accurately complete their assignments. Participants' practices included using a one-at-a-time approach, so students were not overwhelmed by the introduction of too many platforms and resources all at once. The teachers provided students with ample practice through the completion of assignments until they understood how to use the particular digital tool. Once that happened, additional tools could be added to their students' repertoire. Participants also used video tutorials and step-by-step

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instructions to help students navigate new digital tools and platforms. Teachers provided clear directions that students could easily follow when using these resources for the first time or to refresh their memory, giving students the support they needed to find success as they completed assignments and projects using digital tools.

Furthermore, the participants encouraged their students to challenge themselves by creatively using digital mediums to enhance projects and presentations. In fact, one participant described how her students used a popular video game to add another dimension to a project (Kasey). Although such practices are examples of good teaching, the participants' practices also demonstrate a commitment to providing their students with continuous learning opportunities. Such practices incorporated growth mindset as the participants worked to improve students' digital literacy through practices that challenged their students, always encouraging their students to learn more and to continue to get better (Dweck, 2007).

Teachers also provided students with the skills and resources needed to overcome obstacles, such as making mistakes or trouble-shooting technology issues. Undoubtedly students would come across connectivity issues, online platform malfunctions, or uncertainty about how to use certain programs; therefore, teachers provided instruction on the problem-solving skills necessary to deal with these digital setbacks, so students could resolve them independently or know where to find the resources to get the help they needed. Teachers provided students with a list of strategies or steps to take before asking for help, giving students the opportunity and confidence to solve problems on their own. Placing ownership on students to use the resources available to them teaches them both the skills to troubleshoot issues with technology and the skills that could be

transferred to other problems they may face. Growth mindset practices include those that prepare students to embrace challenges, respond to setbacks, and to overcome failure (Dweck, 2007). Understanding the difficulties inherent in using technology, the participants worked to ensure their students had the confidence and the tools needed for success.

  Theme #7: Downloading Digital Literacy Instruction. Because of the overwhelming array of digital learning platforms available to teachers as well as the expectations of districts to make use of these tools, teachers made decisions about which tools to use for different lessons and with different groups of students to ensure that students could operate within these learning platforms to access the content. Practices that foster growth mindset emphasize the process of learning new things, developing skills, welcoming challenges, and overcoming mistakes and setbacks (Dweck, 2007). Therefore the teachers provided instruction not only in their content areas, but to prepare their students with the appropriate digital literacy skills students needed to navigate the digital learning platforms they were using to access content. For example, one participant, Job, provided an artifact which explained how to navigate an online banking simulation platform along with an introductory assignment to help students engage with the digital tool, learning the features and functions they would be using throughout the course (see Figure A1). Since instructional technology is not new in education, many participants had already developed and refined instructional strategies which allowed them to prepare their students for the use of these digital tools.

  Some teachers provided training on a variety of digital literacies, its history, and how to use it appropriately and safely. They required students to use technology when

completing projects, conducting research, and creating presentations. The teachers

provided one-to-one support and attention to students based on their individual questions

and needs and helped them become familiar with specific technology tools and programs.

Such practices provided in-the-moment modeling and feedback for students to follow as

they worked on their own projects and assignments. Indeed, when it comes to teachers'

instruction help shape students' beliefs, which in turn, influences their performance

(Rattan et al., 2012; Park et al., 2016). Thus, the participants used growth mindset to

address their students' digital literacy needs, by designing instruction to support the

learning processes of each student, promote understanding of the various digital literacy

skills, communicate high, yet achievable expectations and focus on the learning process

(Rissanen et al., 2019).

Teachers also provided instruction to help students learn how to use technology

for organization. Teachers trained their students to use these digital resources as part of

their daily instruction and learning and held them accountable for using the tools they had

available to digitally organize and manage their workflow, monitor teacher

communication, and receive notifications from their virtual learning platforms. In fact,

one participant shared the directions she provides to students for managing their email

(see Figure B1). Such practices demonstrate strategies which can help students to stay

organized, allowing them to manage their communication with teachers and to receive

timely feedback related to their assignments. Since feedback is an important part of

achieving success and overcoming mistakes and failure, teachers must ensure that

students have access to feedback to improve learning and achievement, thereby fostering

a growth mindset among students (Dweck, 2007. Hence, the participants provided

instruction on how to use the digital tools and then provided opportunities for their students to engage with these tools to increase their comfort, confidence, and ability to use them proficiently.

   Theme #8: Casting the Net. Digital tools and the Internet open many opportunities for students to collaborate not only with their peers, but also with students from other schools - even those from other countries. For example, one teacher described a project in which her students collaborated with students from Israel and worked on solutions to real-world problems. Having digital tools made it possible for her students to have this collaborative experience, while they also learned how to resolve practical issues, such as time differences and scheduling disparities (Marie). Fostering a growth mindset means establishing solid plans to deal with problems and challenges (Dweck, 2007). Therefore, Marie worked with her students to address the difficulties created by the time disparities, making it possible for her students to connect with their peers on their collaborative project.

   The opportunity to digitally collaborate with students from around the world requires students to learn proper digital citizenship skills, or netiquette. Therefore, the teachers modeled for students how to write a proper email and required students to use such guidelines in all correspondence. Similarly, the teachers required their students to check their email regularly by making it part of their routine. The participants sent students important information via email and required students to communicate using email. The teachers held students accountable for improving their email etiquette along with their communication skills. The teachers also used email correspondence as a way to teach digital citizenship by establishing boundaries and setting limitations on when they

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would communicate with students. The participants also required students to model good citizenship by having them put their digital devices aside when engaged in face-to-face instruction. When teachers model good digital citizenship, such as setting boundaries and expecting their students to model appropriate use, students have the opportunity to develop good foundational skills relating to acceptable and proper use of technology. Teachers who employ growth mindset practices actively encourage their students to seek ways to grow and learn and find strategies that will allow them to work through new experiences and obstacles that become part of those new experiences (Dweck, 2007).

Digital Literacy and the Curriculum. It is important to recognize that digital literacy instruction varies across content areas based on the needs of a particular course (Hague & Peyton, 2012). For example, in a mathematics course, the digital tools students use, such as calculators, are designed for mathematics instruction, such as creating graphs and charts, conducting data analysis, or completing computations. Contrarily, the technology used in the liberal arts and science courses is aligned with research, experimentation, simulation, collaboration, and exploration as it relates to the particular content being taught. Whereas, the technology instruction in a STEM course or a Computer Science course will likely cover a large of array of tools and concepts related to how technology works along with the various uses of technology. The needs between such courses are different, requiring that teachers possess different skills sets to teach different skills to students (Hague & Peyton, 2012).

Indeed the participants in this study shared diverse digital literacy instructional practices. While some of the teachers provided a cursory discussion of the digital tools

and platforms they use for instruction (i.e. YouTube, Google Classroom), others shared about the many ways in which their students engaged in employing digital literacy to engage with the outside world for purposes of collaboration and authentic learning experiences (i.e. Twitter, LinkedIn). The sophistication of the digital literacy skills instruction was often directly linked to the specific needs of the content area. Likewise, the skills with which a teacher provided digital literacy instruction was also linked to the need to use digital tools and technology to access course content.

Research Sub Question 2

How are instructional practices used to promote digital literacy in high schools located in privileged school districts different from those used to promote digital literacy in disadvantaged school districts? To determine whether a school served a higher percentage of "economically disadvantaged students," the "NJ School Performance Report" as well as the *Public School Review* was referenced (NJ DOE, 2020; Public School Review, 2018). Schools that served 50% or more economically disadvantaged students, specifically, students who were eligible for free or reduced lunch were determined to be disadvantaged; whereas schools that served less than 50% of economically disadvantaged students were determined to be privileged. Based on this criteria, eight of the participants taught in disadvantaged school districts, and seventeen of the participants taught in privileged schools. The following sections highlight a comparison of the instructional approaches implemented by the study participants, providing an answer to the research question.

Privileged School Districts. Teachers who work in schools located in privileged districts, in many ways engaged in instructional practices that promoted strong digital

literacy skills. There was significantly more direct digital literacy skills instruction as opposed to the superficial use of digital tools and platforms for rote learning or academic reinforcement. Digital literacy skills instruction was focused on building the proficiency in using digital tools themselves and applying digital literacy skills to learning. Among other things, students learned how to use digital resources for research, evaluation, analysis, problem-solving, collaboration, and presenting information. Teachers working in more privileged districts demonstrated not only greater knowledge of digital technologies and resources available to their students, but also a greater understanding of effective instructional practices needed to teach their students how to use it. Likewise, their students were provided with many more opportunities to use technology and digital literacy skills to engage in real-world learning experiences. Moreover, these districts tended to foster teachers' personal and professional development by encouraging and supporting attendance at conferences and training identified through the professional networks and organizations to which the teachers belonged. In these settings, students were getting well-rounded digital literacy skills instruction, which allowed them to build their skills and apply these skills to their content. Likewise, students were being prepared to be successful during college and in their subsequent careers.

Disadvantaged School Districts. Teachers who work in schools in disadvantaged districts often described a more superficial approach to digital literacy skills instruction. In many cases, the opportunity to engage with technology was for rote learning, such as note taking or basic skills practice; for vocational training; and to study for or complete assessments. Teachers discussed using basic Google applications, such as Google Classroom, for their students to submit work or showed supplemental learning videos as

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part of their digital literacy skills instruction. Digital literacy skills were not necessarily taught for the sake of the skills themselves, but were taught only as it related to accessing certain software programs for the purpose of practice or reinforcement. Some teachers were not even aware of what digital literacy skills instruction was, stating it was not part of their course curriculum to teach it. Others relied heavily on their students' knowledge of how to use technology rather than teaching them new skills, believing that the available learning platforms were instinctual and easy enough to use. Although students were being exposed to various digital tools and they were expected to use these tools, teachers' practices did not provide the direct digital literacy skills instruction that students needed to be successful. Instead, students were being provided with devices and learning tools that did not promote critical thinking, did not require them to conduct research, and did not teach them how to use technology to solve problems or collaborate with their peers. Teachers working in districts that serve students from economically disadvantaged homes often lacked the resources and the training they needed in order to provide their students with the digital literacy skills necessary to help them succeed in college and career.

Research Question 4

How have high school teachers' instructional practices that promote a growth mindset among their students evolved to accommodate the remote learning environment? For students to be successful online learners, teachers must prepare them to be self-directed learners. Self-directed learners possess the skills which allow them to engage in self-directed learning, planning, goal setting, and problem-solving (Spencer, 2021). Therefore, they must use strategies that allow them to learn the curriculum while

navigating the virtual platforms and tools needed for success (Spencer, 2021). Strategies

that foster a growth mindset can help students manage learning in the remote

environment. The following theme highlights how the study participants used a variety of

approaches to help their students' transition to the remote learning environment,

providing an answer to the research question.

        Theme #9: Remote Instruction: A Distant Relative to Learning. Teachers

prepared their students for online learning and made it easier for them to overcome

challenges and to find success in an unfamiliar instructional atmosphere. Teachers'

approaches included giving students the opportunity to recognize the situation for what it

was and think about ways to work through it. Teachers built time into their lessons and

talked to students about individual experiences and what could be done to create a

productive learning environment from home. Acknowledging that remote instruction was

difficult and recognizing the distractions that interfere with students' learning was

necessary in order to identify what needed to be done for students to learn. Teachers also

modified their traditional instructional practices to which students were accustomed.

Faced with asynchronous instruction, teachers were no longer able to provide the direct

instruction and modeling necessary to teach students new skills; instead, they ensured

that students could access the content in a virtual format, without direct guidance.

Teachers presented activities and lessons that students could independently learn.

Teachers also created new activities that students could do on their own while still

learning the course material.

        As the COVID-19 crisis continued into the fall of 2020, synchronous remote

instruction became the new norm, especially as many schools also adopted hybrid models

of instruction. Synchronous learning offered the benefit of being able to interact with students in real-time, which made it easier to foster instruction that was more in line with traditional methods. Teachers responded to this learning environment and engaged in practices that focused more on the learning process; that were more collaborative and allowed students opportunities to work together and to contribute to the learning of others; and that were more flexible and allowed students more time to complete assignments while they also managed the new virtual platforms.

Research Sub Question 3

How have high school teachers used the transition to a remote learning environment to change their instructional practices in order to address students' digital literacy needs? The transition to the remote learning environment did provide a unique opportunity for teachers to directly teach digital literacy instruction. Since students were required to use various digital resources and online learning platforms in order to access content, it was necessary to provide them with the skills and strategies needed to navigate these platforms. The following theme highlights the diverse instructional approaches implemented by the study participants, providing an answer to the research question.

Theme #10: "A Trail of Digital Breadcrumbs." Because many districts did not require synchronous instruction during the initial transition, there were many students who were unprepared for synchronous, virtual instruction in the fall of 2020. Teachers recalled their experiences as students returned to school and entered their classes for the first time. They explained how a lot of students simply did not know how to get connected and needed a great deal of direct instruction and guidance just to be able to understand how to use the programs. Although teaching them remotely made things more

challenging, teachers took the time to guide their students through the technology one step at a time. Because teachers were compelled to use technology and digital tools and platforms in their instruction, and because students were required to use that technology in their learning and work completion, students got more practice using the tools and became more proficient.

As time went on, teachers found that remote instruction had some benefits as it related to students' competence with technology. Teachers used remote learning as an opportunity to build students' digital literacy skills whether by teaching them how to use new platforms or by improving their digital comprehension through research and exploration. Teachers found ways to increase students' knowledge of digital literacy by switching the focus of a lesson slightly to open opportunities for students to become better acclimated with the technology. Teachers also found ways to teach their students how to become better digital collaborators using digital formats. One teacher described how she used platforms, such as Wonder, for collaborative learning, which allowed students to be the moderators of the task, while she acted as a guide and observer. She even noted the students' positive response to the activity and shared that "they loved being able to move around…they said they felt like they were outside running around" (Marie). Teachers provided opportunities for students to build digital literacy skills, which could be transferred into other learning activities and other content areas, and helped their students become better learners all around.

Research Question 5

How do teachers perceive the digital divide and its effects on students and the transition to remote instruction? The digital divide "explain[s] the gap between people

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who can easily use and access technology, and those who cannot" (West, 2011, p. xxiv). In order to contribute to narrowing the gap, it is important that one has an understanding of what it is, how prolific it is, what its effects are, and how it can be narrowed. The following theme highlights the different understandings held by the study participants as it relates to the digital divide.

  Theme #11: The Digital Divide: Not a Mountain Canyon in Tron. This theme came from a study participant, who, when asked to describe what he knew about the digital divide, responded, "Oh, the digital divide. That sounds like a mountain canyon in Tron (Duane). His comment really stood out because at that point in the data collection and interview process, it had become clear that many of the participants were completely unaware of what the digital divide was, while others had only a superficial understanding of it. Such a discovery was alarming because without knowledge of what the digital divide is, we have no hope of narrowing it; we will not discover the means by which we can provide access to digital technology and resources or to teach individuals how to appropriately use those resources and improve their digital literacy skills.

  No Knowledge of the Digital Divide. Ten of the study participants were generally unaware of what the digital divide is. One participant responded with "I don't know anything. I've never heard that phrase" (Ella). Another teacher also admitted, "I know nothing," but attempted to guess that it was the difference between those who use technology and those who do not (Ramen). Still one other participant believed the digital divide to be the difference between one's online and real world persona (Duane). For most of the participants, it was necessary to explain what the digital divide is and how it is manifested in both education and society. I provided detailed descriptions of the three

levels of the digital divide, describing the issues relating to access (socioeconomic and geographic access), ability to use digital tools and the Internet, and disparities related to benefits associated with Internet use as an extension of the first two levels. From this description, some of the participants understood what was meant by the digital divide and were able to convey some understanding along with some experiences both personal and observed.

Among several of those who were aware of the digital divide, their knowledge was limited to an understanding of access. While there could be several reasons why one might not be familiar with the digital divide, a justification most commonly shared or discussed by the participants was a general lack of experience. Specifically, several of the participants shared that they didn't see that digital divide as an issue in their school district, so it was not something in front of them every day. Whether it was simply that students had their own devices, the school provided devices, or they were unaware of the types of access their students had outside of school, the digital divide was not a common part of teachers' experiences, and they had limited opportunities to learn what the digital divide actually was.

A New Level of the Digital Divide: Digital Non-Transference/Complacency. Despite what the participants knew as it related to the digital divide, one idea that was consistent across the board was students' inability to learn remotely and to use digital tools and digital platforms to access educational content. Research exists that concludes students have not been successful learning remotely. However, there was a sense that students *should* be better at learning remotely; they *should* have adapted better than they did. Because students today are digital natives, they have grown up with a great deal of

technology, they have begun using technology at a very young age, and they have been exposed to educational technology for their entire school career, it seemed to be a fair expectation that students would naturally and seamlessly transition into remote learning. This was not what happened. Students across the board did not transition well into remote learning. The majority of students across the country struggled, fell behind, and continue to suffer from the learning loss experienced during the peak of the COVID-19 crisis.

Consequently, there exists another level of the digital divide, one that I have classified as Digital Non-Transference, or Digital Complacency. Although the existing levels of the digital divide have included a socioeconomic perspective, and one could likely identify the existence of such a divide between students from lower socioeconomic backgrounds and their more advantaged peers, I am referring here to a divide that exists between the technological abilities that students *do* have and their inability to transfer those abilities to virtual learning. It had been the experience of many educators that students had significant difficulties completing work, staying engaged, and managing their overall academic performance while engaged in remote learning. Given the access to technology and the direct instruction of digital literacy skills prior to the transition to remote learning, students were simply disappearing from the virtual learning environment, demonstrating a divide between what they could reasonably be expected to accomplish and their actual performance. Other relevant factors aside, students were essentially complacent when it came to their learning during remote instruction; they simply did not transfer their skills and abilities to virtual instruction and learning.

Integration of Findings

Integration of data is a principal feature in an MMR design, and it varies based on the type of approach employed (Creswell & Plano Clark, 2018). Integrating the data can occur at any point during the mixed methods study; it is not something that just happens at the end (Creswell & Plano Clark, 2018). An explanatory sequential MMR design uses the quantitative data to plan and design the qualitative phase. In this study, the purpose of the quantitative data was to identify the participants for the qualitative phase of the study, using the case selection variant design (Creswell & Plano Clark, 2018). The quantitative data answered the first two research questions, and provided an analysis of two of the participant selection criteria, allowing me to create a preliminary list of potential participants. Specifically, this initial analysis helped to identify the teachers who implement instructional practices that promote a growth mindset and who provide direct digital literacy skills instruction. Quantitative data was further analyzed to identify the additional criteria, allowing me to finalize the participant collection pool. This second analysis looked specifically at those teachers who participated in remote instruction as well as those who were willing to participate in the qualitative interview. Therefore, the quantitative data helped me to select the eligible participants for the qualitative phase.

Creswell and Plano Clark (2018) explain that a strong relationship between the phases allows the researcher to achieve more meaningful explanations. One such relationship is that the participants for the qualitative phase of the research were drawn from the same pool of participants who participated in the quantitative phase. The interviews allowed for a further exploration of the quantitative data. Specifically, the interview questions which reflected similar elements of survey questions, offered the

participants an opportunity to provide detailed narratives about their growth mindset practices, their digital literacy instruction, and how their growth mindset practices are used in their digital literacy instruction. Moreover, the interview questions asked participants to describe their experiences engaged in remote instruction and how their growth mindset practices evolved during that transformation. Furthermore, participants were asked about the digital divide and their experiences with the divide in their schools and during remote instruction.

The participants' rich, detailed responses provided a deeper understanding of the quantitative data because it offered specific examples of what teachers' instructional practices that promote growth mindset and digital literacy look like in actual application. Additionally, the participants who were interviewed provided instruction in a variety of educational settings and contexts (i.e. different content areas, different schools, different counties, etc.); the characteristics of the participants in this study along with their instructional practices can be generalized to include other teachers who may already engage in or who could adopt those teaching practices. The collected documents were also analyzed to provide visual and tangible evidence of the participants' professed growth mindset and digital literacy instruction underscored during both the quantitative phase and qualitative phases. Finally, as the quantitative data also identified participants who do not use or buy into growth mindset practices or provide digital literacy instruction, the qualitative phase of the research offered helpful strategies these participants could adopt into their own teaching practices.

Conclusion

This chapter presented the quantitative and qualitative findings of this study and analyzed the integration of both data sets. The quantitative findings identified the percentage of teachers responding to the survey who implement instructional practices that promote growth mindset, implement direct digital literacy instruction, and participate in remote instruction, answering the first two research questions. The data also identified teachers who were willing to participate in the qualitative phase of this research project. The qualitative findings uncovered eleven themes, highlighting the experiences of the interview participants as it related to their growth mindset practices, their digital literacy instructional practices, how digital literacy practices differ in schools serving advantaged and disadvantaged students, and how participants' growth mindset and digital literacy practices evolved during the transition to remote instruction, answering the last five research questions and sub-questions. Additional qualitative findings, which fell outside of the scope of the research questions, included an analysis of the learning loss, the student disengagement, the emotional impact of the transition to remote learning, participants' knowledge of the digital divide, and an exploration of another level of the digital divide.

Chapters 5 and 6 of this dissertation are written as manuscripts with the intention of publication. Chapter Five will present an empirical article written for the *Journal of the Learning Sciences*. This journal publishes research from multiple disciplines and contributes to the theories of how people learn and the design of learning environments. The article will focus on the potential of growth mindset practices in digital literacy skills instruction. Chapter 6 is a concise conceptual paper for the *American Educator*. This

journal is published by the American Federation of Teachers and covers research and ideas on such topics as early childhood through higher education, curriculum and instruction, how students learn, diversifying the teaching profession, and confronting bias in schools, among other educational contemporary topics and trends. This discussion will be framed within the context of remote instruction, providing suggestions for identifying and overcoming the divide (i.e. using growth mindset/digital literacy practice). Both articles will be co-authored by Dr. Ane Turner Johnson, who served as my dissertation chair. The reference list for chapters 1 through 4 follows the manuscripts presented as Chapters 5 and 6 to complete this dissertation.

Chapter 5

Growing Digital Mindsets: Public Secondary School Teachers, Growth Mindset, and Students' Digital Literacy Skills in a Remote Learning Environment

Abstract

Background: There is a great deal of research on teachers' instructional practices that promote growth mindset at the elementary level; however, there is much less research on instructional practices that promote growth mindset at the secondary level. Furthermore, while there is research on digital literacy instruction, there is limited research on integrating growth mindset practices in digital literacy instruction. Finally, research has yet to be published which discusses how growth mindset practices and digital literacy instruction are implemented in the remote learning environment. This paper's aim is to highlight high school teachers' instructional practices that promote growth mindset amongst their students, how those practices are incorporated into digital literacy instruction, and how those practices were applied to the remote learning environment. **Methods**: In this study, a quantitative survey was used to identify teachers who use growth mindset in their instructional practices, who provide digital literacy instruction, and who provided remote structure during the COVID-19 pandemic. From this data, 25 teachers were chosen to participate in in-depth, semi-structured, responsive interviews. Furthermore, documents were collected from some of the participants and reviewed. **Findings**: When investigating teachers' instructional practices that promote growth mindset, it was found that teachers also use growth mindset when teaching digital literacy skills and maintained these practices in the remote learning environment.

Contribution: These findings have implications for using growth mindset practices in the secondary educational setting. Integrating a growth mindset during digital literacy instruction could be beneficial for improving digital literacy instruction as well as in developing effective instructional practices for the remote learning environment. More knowledge on the effectiveness of these strategies as it relates to students' performance can inform methods and instructional designs for instructional programs focused on growth mindset, digital literacy, and remote instruction.

Across the contemporary educational landscape, technology has become an inextricable part of teachers' pedagogical and instructional practices. Indeed, computer-based instruction (CBI) was designed to engage diverse learners through the provision of meaningful learning experiences tailored to meet their unique, individual needs (Anand & Ross, 1987; Kulik, 1991; Ross, 2020). Likewise, the primary goals of CBI are improving digital literacy, equitable access, and higher-level learning (Ross, 2020). These goals, coupled with the aim to enhance student performance, interest, and motivation, emerges from an understanding of technology to engage students in a way that is familiar, relevant, and stimulating. Not only does effective implementation of technology have the potential to improve student learning and achievement, but it can also have a profound impact on students' digital literacy skills (Bergdahl et al., 2020; van Laar et al., 2017).

With the advent of the COVID-19 crisis and subsequent transition to and continued imposition of remote virtual learning, technology is now an immutable component of the daily academic environment. Recent research has highlighted the effectiveness of instructional practices implemented during the transition to remote learning (Lucas et. al, 2020; Morgan, 2020). Yet, other research has identified "student learning loss" (Buda & Czékmán, 2021) and the "COVID slide" resulting from the transition (Gewertz, 2020), as well as students' limited digital literacy skills to be effective learners in this new environment (Udeogalanya, 2021; Karagul, et al., 2021). Additional research on teachers' instructional practices relating to improving students' digital literacy skills, not only in the continued remote learning environment, but in all future learning, is needed. Therefore, this study aimed to explore teachers' instructional practices that promote a growth mindset, how growth mindset practices are used in

providing direct digital literacy skills instruction, and how those practices evolved during the transition to remote instruction.

Conceptual Framework

With the emergence of remote instruction because of the COVID-19 pandemic and the closing of school buildings across the country, teachers were compelled to adapt their instructional practices and incorporate new, virtual instructional platforms (Fagell, 2020; International Task Force on Teachers for Education, 2020; Reimers, & Schleicher, 2020). They were required to come up with creative ways to teach students the curriculum (Schwartz, 2020), learning how to teach to students in the physical classroom while simultaneously teaching to students in a remote setting (Reimers, & Schleicher, 2020; Lieberman, 2020b). Meanwhile, lessons and activities that were both challenging and engaging to students while also meeting the needs of the changed learning environment had to be created (De Witt, 2020; Merrill, 2020). Overall, teachers were innovative in adapting their instructional practices while keeping students motivated and engaged (Schwartz, 2020).

Teachers had to become technologically proficient to help their students navigate connectivity issues and the technical problems they encountered negotiating the various new learning platforms (Bushweller, 2020). In conjunction with the technical issues, simply learning remotely was difficult for many students. Recognizing this challenge, teachers used this opportunity to help their students improve their digital literacy skills (Buchholz, et al., 2020). Research on digital literacy emphasizes "the skills and practices students use to navigate, curate, produce, and consume digital media" (Nichols et al., 2020, p. 107). Specifically, digital literacy focuses on how students use digital

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technologies to find, analyze, and communicate information. Virtual instruction opened

the door for teachers to teach their students how to explore their digital resources to find

information, solve problems, and collaborate with their peers (Buchholz, et al., 2020;

O'Brien & Scharber, 2008). Notwithstanding this potential, the transition to remote

learning and the possibility of continued remote learning in the future, uncovered a need

for ongoing, focused attention, instruction, and intervention of students' digital literacy

skills.

As teachers approach teaching and learning, whether in a traditional or remote

learning environment, implementing a growth mindset as part of their everyday practice

and instructional strategies can enhance student learning and achievement by improving

students' resilience, especially in the face of challenges and setbacks (Dweck, 2017;

Blackwell, et al., 2007). Growth mindset is the belief that intelligence is malleable, not

fixed, and asserts that through learning, effort, and hard work students can develop their

intellectual ability (Dweck, 2007; Dweck, 2017).

Growth Mindset

Whether approaching teaching and learning in a traditional classroom or in a

remote, virtual environment, teachers who implement instructional practices that promote

a growth mindset can improve student learning and achievement by helping students

develop the skills needed to meet challenges and to overcome mistakes and failure

(Dweck, 2017; Blackwell, et al., 2007). Individuals with a growth mindset do not seek to

prove how smart they are by engaging in safe or unchallenging tasks; instead, they seek

out new and difficult tasks, understanding that with perseverance and effort they can meet

new challenges, enhance performance, and learn new skills thus increasing their

intelligence (Davis, 2016). Growth minded individuals are not defined by their failure, rather they use failure as an opportunity to continue growing, learning, and improving (Dweck, 2017).

Fraser (2018) identified various instructional strategies designed to promote growth mindset thinking, such as the intentional planning and implementation of growth mindset practices, embedding growth mindset principles into the classroom culture and instructional practices, recognizing outside factors that influence students' mindsets, and understanding pupils' approaches to learning. Blackwell et al. (2007) further suggested that when students understand how the brain functions and how learning can improve and enhance intelligence, they will seek control and responsibility over their own learning. While temporary growth mindset interventions may bring about a short-term impact, Dweck (2010) proposed that a school's culture and beliefs about education will help shape students' approaches to learning while also encouraging a growth mindset. Moreover, Woodbridge et al. (2014) found that the means to ensure intervention sustainability is a staff who believes in the effectiveness of the intervention. Therefore, in order for students to benefit from the implementation of growth mindset practices, the manner by which said practices are executed must be deliberate, consistent, and well supported.

It is possible to learn how to change one's mindset through direct and intentional instruction and training (Dweck, 2017). Paunesku et al. (2015) explained that "[g]rowth mindset interventions convey that intelligence can grow when students work hard on challenging tasks—and thus that struggle is an opportunity for growth, not a sign that a student is incapable of learning" (p. 785). Several studies have highlighted the

effectiveness of growth mindset interventions on student effort, resilience, motivation, and achievement, (Mrazek et al., 2018; Cook et al., 2019; Yeager et al., 2019; Xu et al., 2020; Yeager & Dweck, 2012) Yeager & Dweck, 2020). Moreover, Aronson et al. (2002) in his work with college students, provided growth mindset training, which had the effect of raising their semester grades (Aronson et al., 2002). In another study, researchers provided middle school students with eight growth mindset workshops, and as a result, the students' math scores improved (Blackwell et al., 2007; Good et al., 2003). Such studies lend support to the notion that growth mindset interventions and training have the potential to improve student learning and achievement outcomes by improving student motivation, effort, and perseverance when challenged.

Other growth mindset interventions, such as sense-of-purpose interventions (Yeager & Bundick, 2009; Yeager et al., 2014) and relevance interventions (Hulleman & Harackieqicz, 2009) have led to sustaining motivation and raising student achievement (Yeager et al., 2014). Dweck (2006) found that individuals who possess a growth mindset have a unique hunger for learning, rather than simply a hunger for approval or affirmation regarding how smart one is. Dweck's research with children and adults, beginning more than 40 years ago, has demonstrated how a belief that intelligence can be increased, and that hard work and effort can lead to mastery, has inspired individual students to attempt challenging tasks and persist even in the face of failure and setbacks (Dweck, 2000; Claro, et al, 2016).

Transition to Remote Instruction

The COVID-19 pandemic created a need to move instruction online, and "Emergency Remote Teaching (ERT)" took hold (Shamir-Inbal & Blau, 2021, p. 1244).

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Successful ERT can provide a productive and supportive learning platform enabling flexible teaching and learning throughout the course of the emergency (Cheng, 2020; Hodges et al., 2020). Consequently, distance learning (DL) provides technology-based instruction in synchronous, asynchronous, and hybrid learning environments while simultaneously providing students an element of choice with respect to when and how to engage in the learning activities provided by their teachers (Cheng, 2020). This was especially important during the beginning of the crisis as students often faced unique circumstances based upon where they lived, their access to technology, and the ways in which instruction would be implemented by a particular school district.

It is important to recognize, however, that ERT and DL pose several requirements as it relates to the operation of technology, the necessary skills for teaching online, and the management of student learning (Shamir-Inbal & Blau, 2021; Zhang, 2020). These requirements include the necessary skills teachers and students would have developed during traditional, in-person learning as well as an adequate infrastructure which provides the necessary technology. Not surprisingly, the COVID-19 pandemic highlighted various challenges for which many educational systems were not sufficiently prepared (Kong, 2020). The sudden shift to ERT was especially arduous because of established pedagogy based on the in-person transference of information and absorption of educational content and limited knowledge of how to transition such pedagogy to an online learning environment (Cheng, 2020). Nevertheless, the expectation was to maintain daily teaching-learning operations and provide a continuity of instruction to students (Shamir-Inbal & Blau, 2021).

Despite these challenges adapting to DL during the shift to ERT underscored many potential benefits, such as advancements in the ways education is provided, improving student motivation towards online instruction and learning activities, broadening equitable educational access, and building students' self-regulation and independent learning strategies (Blau & Shamir-Inbal, 2017; Harris-Packer & Segol, 2015). The leaders of educational institutions embraced these benefits by improving schools' technological infrastructures, providing training for teachers to help them improve and adapt their instructional strategies for the remote setting, and strengthening school leadership support and teacher collaboration (Huang et al., 2020). In many ways, educators also rose to the challenge and adapted to the online learning environment. Teachers integrated online resources and redesigned their course work into digital tasks their students could complete independently. They also increased communication with students and their guardians through school platforms, such as email or other social networks (Kong, 2020; Blau & Hameiri, 2017; Cheng, 2020; Blau, et al., 2020).

Moreover, teachers implemented a number of creative, and diverse teaching strategies which included synchronous, asynchronous, and hybrid learning styles. Teachers provided a balanced approach which included whole-group instruction to teach new content and allow students opportunities to socialize, independent learning activities that fostered student self-support and individual completion, and group learning activities that fostered collaboration and partnership with peers (Shamir-Inbal & Blau, 2021). Although not without setbacks and potential long-range consequences, such combined practices allowed educators to continue to provide instruction to students during an unprecedented emergency.

Digital Literacy

Digital literacy involves complex analytic abilities, including the application of cognitive, motor, and socio-emotional skill sets in a variety of different contexts (Eshet-Alkalai, 2012). Digital literacy includes the ability to find, evaluate, and communicate information to others. Likewise, it includes the potential to create original content used for self-expression to foster and promote one's personal and professional goals (Iordache, et al., 2017). Acquiring digital literacy skills has multiple implications for students and their futures both in continuing education and in careers. For one, digital literacy can improve students' motivation, ability to self-regulate, and their overall academic performance (Adobe, 2017; Porat, et al., 2018). Furthermore, proficiency in digital literacies is necessary for survival in the current digital and knowledge society. Digital literacy refers to far more than rudimentary technical abilities; rather it involves the specific range of knowledge, abilities, and attitudes needed to adequately function in a comprehensive digital environment (Ferrari, 2012).

Digital literacy skills enable users to operate effectively and skillfully in the diverse digital environments in which they will engage as part of their continued learning, career, and daily living (Hague & Payton, 2010; Mohammadyari & Singh, 2015). Ng (2012) explained that digital literacy skills include the ability to engage in critical thinking as one searches, evaluates, and creates various modes of digital information. Likewise, such skills include the ability to assess and choose the applicable programs with which to learn or complete a specific task (Ng, 2012). Digitally literate individuals understand multiple digital literacies and can comprehend and make use of text-based, visual, auditory, and multimodal information (Ng, 2012). Students today must have

suitable education and training to effectively operate the continuously changing collection of technology devices and programs that demand reasoning, critical thinking, collaboration, and creativity (Blair, 2012). Xu et al. (2020) suggested that providing growth mindset instruction as a precursor to introducing new skills is effective in students' learning and retention of those new skills. Therefore, growth mindset instructional practices offer the best opportunities for teachers to teach students the digital literacy skills they need for success in any type of learning environment.

Digital Literacy and the Curriculum

It is important to recognize that digital literacy instruction varies across content areas based on the needs of a particular course (Hague & Peyton, 2012). For example, in a mathematics course, the digital tools students use, such as calculators, are designed for mathematics instruction, such as creating graphs and charts, conducting data analysis, or completing computations. Contrarily, the technology used in the liberal arts and science courses is aligned with research, experimentation, simulation, collaboration, and exploration as it relates to the particular content being taught. Whereas, the technology instruction in a STEM course or a Computer Science course will likely cover a large of array of tools and concepts related to how technology works along with the various uses of technology. The needs between such courses are different, requiring that teachers possess different skills sets to teach different skills to students (Hague & Peyton, 2012).

Methods

The purpose of this study was to explore the ways in which high school teachers promote a growth mindset among their students to provide digital literacy skills instruction and how these practices evolved during the transition from face-to-face

instruction to remote instruction. In this study, quantitative data analysis, which allowed

us to identify high school teachers who incorporate growth mindset and directly teach

digital literacy instruction, was combined with qualitative data analysis, which provided

an illustration of how teachers incorporate these practices to foster and improve student

learning and how they helped students transition into the remote learning environment.

Research Questions

1. How do high school teachers promote a growth mindset among their students?

2. How do teachers connect growth mindset practices to the development of
   students' digital literacy?

3. How have high school teachers used the transition to a remote learning
   environment to address students' digital literacy needs?

Setting

In 2020, the COVID-19 crisis required that schools rapidly transition to virtual

learning environments across the United States. In New Jersey, for example, schools

were compelled to close their doors to traditional, face-to-face instruction (NBC10 Staff,

2020). Elementary and secondary school districts responded to this transition in a variety

of ways, including where the school was located, the organizational structure of the

school, available funds, socioeconomic considerations, and the needs of all relevant

stakeholders (Brooks et al., 2020; Reich et al. 2020). The unanticipated change to the

instructional environment changed the work and expectations of teachers and students

(Fagell, 2020; Laster Pirtle, 2020). School buildings were closed, and daily instruction

transitioned to the online environment whether through synchronous or asynchronous

learning contexts. Even after students and teachers were allowed to return to the school

buildings, in-person class sizes were reduced as hybrid instruction - a mixture of face-to-face and online learning - became the norm. This hybrid environment continues to be a part of the educational landscape as students are occasionally required to quarantine because of contracting or being exposed to COVID-19. In whatever form it took - synchronous, asynchronous, or hybrid - remote instruction called upon teachers to provide vigorous and meaningful learning experiences to all students.

Participants

The participants for this study were high school teachers from public high schools across New Jersey, of which there are approximately 20,000. By including such a wide selection of high schools across New Jersey, I implemented a survey to help identify a diverse group of participants for the study. To participate in the study, participants demonstrated that they promoted a growth mindset among their students, directly provided digital literacy skills instruction, and engaged in remote teaching. Sampling captured a diversity of participants among the teaching workforce in NJ, representing every aspect of the high school curriculum (see Figure C1). Each participant was provided with a pseudonym - either self-chosen or assigned - for the purposes of confidentiality.

Data Collection

To answer the research questions, an online survey, created to identify participants for the qualitative phase of the study, was completed by 462 public high school teachers. The survey was made available directly via email to secondary school teachers in at least 13 counties across New Jersey. Furthermore, the New Jersey Education Association (NJEA) provided a link to the survey on their social media

platforms. Using the data from the survey, 25 public high school teachers were interviewed, using in-depth, semi-structured interviews. Additionally, documents related to growth mindset and digital literacy were collected from several of the interview participants and analyzed. All participants had taught in the remote learning environment during the COVID-19 pandemic.

Interviews

In this study, I employed in-depth, semi-structured interviewing. The strength of the in-depth interview rests in its capacity to establish a research space in which the participant was able to tell his/her story, providing the researcher with diverse understandings and ideas about a particular topic (Morris, 2015). I used a responsive interviewing style that allowed for flexible questioning that enabled adjustment and additional questions during each individual interview (Rubin & Rubin, 2012). Responsive interviews also recognize and embrace the emotional responses of participants, asking sensitive questions in a non-direct way that puts the participants at ease (Rubin & Rubin, 2012).

During the in-depth, semi-structured interviews, participants were asked questions about their growth mindset practices, their digital literacy instructional practices, how they combine growth mindset practice and digital literacy skills instruction, and how these practices changed during the transition to remote learning. Example questions included: How do you practice Growth Mindset in your classroom? How do you provide direct digital literacy instruction to your students? In what ways do you incorporate growth mindset practices into your digital literacy skills instruction? How have your growth mindset practices changed since the transition to remote instruction? Some other

questions included how participants plan for growth mindset instruction and the types of

professional development opportunities available to them that foster growth mindset and

digital literacy instruction.

Document Review

A document review was also conducted to provide a more comprehensive

analysis of teachers' instructional practices that promote a growth mindset, how these

practices promote digital literacy, and how these practices evolved as teachers and

students transitioned to a remote learning environment. Documents are artifacts created

for a specific purpose, to serve a particular function, and can tell researchers a lot about a

particular social setting or an individual (Coffey, 2014). Further, documents may suggest

additional questions that need to be explored or to identify situations that should be

observed (Bowen, 2009). Likewise, documents "provide supplementary research data"

which can prove to be "valuable additions to a knowledge base" (Bowen, 2009, p. 230).

The documents collected from participants included specific learning activities, grading

rubrics, room decorations, and assessment practices. These documents were either

created by the participating teachers or in cooperation with other teachers or school

leaders. Participants provided copies of the documents via email as a follow-up to the

interview.

Analysis

All data were coded using two cycles of coding - provisional and focused coding -

and used to create themes. Provisional coding was used as the first cycle of coding to

establish a "predetermined start list of codes" (Saldaña, 2016, p. 168). These codes were

developed in anticipation of specific categories and types of responses that were expected

to emerge in the collected data (Saldaña, 2016). The provisional list of codes was generated from the initial research, including the literature review, the research questions, and the researcher's prior knowledge and experience (Saldaña, 2016). As the qualitative data were collected and analyzed, the provisional codes were amended and further developed to include new codes. In the second cycle of coding, focused coding was used. Focused coding seeks out the recurring or exceptional codes to develop the most essential categories in the data collection (Saldaña, 2016). This coding method worked well with the provisional coding list and subsequent revision of that list after initial data analysis. The provisional codes were reanalyzed using focused coding in order organize the data into categories and subcategories. Such organization made the data easier to manage, to identify the most salient data categories, and to look for relationships within the data so that themes could be created (Rubin & Rubin, 2012). Themes are "key patterns identified in the data that may be important features of the phenomenon in question," (Nishishiba et al. 2014, p. 286) based on the goals of the research questions. They help to organize and explain the data as it relates to a more comprehensive idea.

Findings

This study explored the ways in which high school teachers promote a growth mindset among their students, how it is connected to developing students' digital literacy skills, and how teachers used the transition to remote instruction to address their students' digital literacy needs. Eight themes are discussed below: growth minded messages, nothing succeeds like success, mistakes are the evidence of trying something new, wrong is not the end result, growing digital mindsets, downloading digital literacy instruction,

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casting the net, and digital breadcrumbs. Data was used from the interviews and the collected documents to exemplify these themes.

Growth Minded Messages

Growth minded messages focus on the "process of achievement" (Dweck, 2007) and include messages about effort, hard work, and trying new strategies. Teachers encourage a growth mindset, not by praising students' intelligence, inherent abilities, or talent, but by highlighting the process through which students overcome challenges, setbacks, and failures. Likewise, directly teaching how the brain works - specifically, how the brain creates new neural pathways during learning - communicates that improving intelligence is largely within an individual's control (Dweck, 2007; Blackwell et al., 2007). The participants explained that messages that convey a growth mindset are important for students to hear. One teacher shared how she begins her school year by providing direct growth mindset instruction to her students:

> We begin the year during the first five days of school, [and] I spend maybe 10 minutes each day. I use Class Dojo. There's like five growth mindset videos. So I use that as like a jumping off point at the start of the year to talk about it. And I have a Desmos activity, card sort type of activity, where kids sort phrases that are either growth mindset, or fixed mindset…And then throughout the year, I just try to as much as possible reference, this idea of like, celebrating mistakes. And, you know, it's through the mistakes that we learn, those types of themes are kind of just sprinkled in throughout the year. (Ella)

These practices introduced a growth mindset and highlighted the differences between fixed and growth minded phrases. These messages are then repeated by the teacher

throughout the year to celebrate making mistakes and to highlight learning through

mistakes. Her practice also involved using technology in the form of online platforms,

Class Dojo (see Figure D1) and Desmos (see Figure D2), which provided opportunities

for students to gain experience using specific online platforms for learning while also

connecting growth mindset to digital literacy development. These practices have become

an integral part of implementing a growth mindset in her learning environment.

Nothing Succeeds Like Success

Teachers consistently acknowledged that their instructional practices, specifically

their messages to students, provide opportunities for success. Moreover, as one

participant with more than 30 years in the classroom explained:

Nothing succeeds like success. So we start from where we know, from what we

know. And we build on that. And if a student can only reach a certain level,

because that is what they can do, that student is so happy in my classroom. And I

have that entering the classroom, it's above the door. It's affirmations that are part

of the day. And then I also put those affirmations on a quiz or a test. (Abilone)

Providing "affirmations" suggests that this participant recognized the opportunities for

the continued success that came from succeeding. Likewise, she communicated those

assurances to her students each day in a variety of ways.

Another teacher described her instructional practices that provided opportunities

for success and to foster learning.

I also picked and chose what things I could teach virtually versus what I needed a

chalkboard [for] and to be there to show them in person. I picked things I knew

they could be successful at learning without me being live…just trying to make

sure they were successful to realize they could learn in a different setting which is

a growth mindset. (Donna)

The participants here emphasized their beliefs about the importance of success on student

learning as well as the value they place on conveying messages of success to motivate

their students to learn something new or to learn in an unfamiliar online environment.

Mistakes are Evidence of Trying Something New

The participants shared that making mistakes and experiencing failure are often a

result of learning new content, engaging in challenging activities, or attempting new

courses. Therefore, they recognized the necessity of creating a learning environment,

built on support and encouragement, as well as fostering the conditions that make

mistakes and failure more comfortable for students. The participants explained how they

celebrate students' mistakes with them and reinforce the idea that mistakes and failure are

part of the learning process. One teacher explained her approach this way:

And so when a kid makes a mistake, or when something is hard, those are my

cues, that I'm going to spin it around and say something like, you know, we want

you to persevere. You haven't learned it yet…You will get there…This is good.

We like mistakes. (Ella)

By acknowledging that the students were still learning something new, she encouraged

them by not only communicating that mistakes are expected, but they are "good," thus

encouraging students to keep trying. Gail explained how she gets her students to work

through mistakes and failure.

If you never make a mistake, that means you're not trying new things. It's okay to

make a mistake. A mistake is part of the whole process. So if something was

challenging today, doesn't matter. What [can] you try a little bit differently, that's

going to help you with that mistake that you made. Really try and think of how

that mistake just improved your ability to do that work. (Gail)

These practices reinforce that mistakes and failure are part of learning, especially

learning a new skill. Specifically, mistakes and failure are expected throughout the

learning process. As such, these errors in learning are celebrated by teachers as they

remind students that learning happens through making mistakes and experiencing failure.

Wrong is Not the End Result

Similar to making mistakes, the participants acknowledged that when students get

something wrong, it should not be the final result. This meant giving students

opportunities to find their way to the correct answer when asked a question, to receive

extra help to understand the content, to correct errors, or to attempt assignments or

assessments more than once. Two participants described how they help students through

questioning strategies to get to a correct answer.

So I do what is called no opt out. So if I asked you a question, you have to

answer it. And wrong answers are welcome in my classroom, and expected

because that's why you're in my classroom…And I established that early on, like

[the] first couple days in the school year. If I ask you a question. I'll phrase it so

that it's what are your thoughts on what you just heard or saw. (Cameron)

Another strategy that belies a growth mindset is wait time…If you don't think the

kid is gonna come up with the answer, you're more apt to move on to the next

student, right? Whereas if you give them proper wait time, it's a tacit

acknowledgement of their capacity. And the belief that, you know, they can

either reason out the answer for themselves, or with a little bit of prompting, and

support whether from you as the teacher, or even better, from another student in

the class than they can get to that answer. (Rian)

According to the participants, such approaches give students opportunities to work

through incorrect responses and get to the answer when they don't immediately know it.

They are given the support, encouragement, and time they need to work through the

problem until they get to the correct response.

Providing students with extra help is another way to guide students through their

mistakes to get to the right answer, or to understand something they were struggling to

comprehend. As Kasey pointed out:

So I always start with what they're doing correct. And then I'll ask questions

about what they got wrong. I won't tell them they're wrong. But I'll ask questions.

And sometimes I'll ask questions, even if it's right, because I want them to explain

to me what their thinking process is. And so once they've explained it, typically,

they're only able to explain it if it is correct. And if they explain it, and it's not

correct, then I'll give them some better ideas [about] what their thinking should be

in this context…I always want to make sure to point out what they're doing

correctly. And give them a few tips. A few hints, depending on the student, I

might give them more help than others…Explain a little bit more on how I got

those answers model a little bit for them. And hopefully, they can pick up on

those skills. (Kasey)

The participants recognized that when students are not initially successful or when they make a mistake, they need opportunities to work through their errors to gain a better understanding of the content they are learning. Thus, students are provided with experiences which allow them to use what they got wrong to work towards getting it right.

Growing Digital Mindsets

Providing direct growth mindset instruction as well as incorporating growth mindset as part of daily instructional practices foregrounds learning and the retention of new skills (Xu et al, 2020). Digital literacy instruction often involves the introduction of new skills, new learning platforms, and the use of technology in new ways. Therefore, employing growth mindset practices as part of digital literacy skill development, can give students the reinforcement needed to acquire the needed skills to succeed, especially in a virtual learning environment. Whereas a growth mindset orients individuals' minds toward learning, a digital mindset refers to an individual's attitude, perceptions, and comfort with technology (Tour, 2015). Specifically, a digital mindset is the idea that "moving a physical product or process to a digital state could differentiate and add value" (Allen, 2020). Thus, the idea of incorporating technology and digital tools into daily instruction creates new learning opportunities and adds value to teachers' instructional practices. As one teacher highlighted:

> We just kind of let the kids be creative. So like when it comes to like the students presenting information…we give the kids free rein. So right now in the class that is reading the book Night, they had to do a found poem, based off this one section of the book. And they had to have a visual to go with their poem. And we told

them that they had free rein with how they wanted that visual to be. So they could

make a video, they could make a slide, they could make a poster, like a physical

paper poster, they could make a Prezi. Like, however, they wanted to express the

visual that matched the theme of their poem that was up to them. And that really

goes along with the growth mindset, because it allowed the students to push

themselves in an area that they wanted to explore how to learn something…as

long as it related to their poem and was of some type of visual representation.

(Leslie)

Adding technology enhanced the lesson and made it more engaging by providing

opportunities for students to interact with and use technology, according to this

participant. Offering options in the types of technology that could be used encouraged

creativity in how the assignment was approached as well as the results that were

produced. Likewise, it provided opportunities to students to become more familiar and

comfortable with different types of technology.

Downloading Digital Literacy Instruction

Digital literacy refers to the ability to use technology: both the hardware and the

software. Digitally literate individuals are more productive, creative, collaborative, and

they possess better skills in critical thinking, problem-solving and decision-making when

using technology (Ocak & Karakus, 2018). Because of the wide array of digital literacy

skills students need to be considered digitally literate and the availability of a broad range

of educational technology and instructional platforms, the participants acknowledged the

need to provide direct digital literacy instruction along with sufficient occasions for

practicing those skills using the available technology tools. One participant described

how he provided digital literacy instruction and furnished the needed opportunities for practice and proficiency.

> If I wanted students to use a specific website, let's say it's…let's say Quizlet, right? If I wanted them to go on and practice something, I don't just say, practice this on Quizlet. I give them a step by step list of instructions of what to do. Go to quizlet.com, click on this button that says Create Account, or whatever. I do it that way. Because everybody will, in theory, unless something else goes wrong, will be able to follow those instructions. I've done that with a website called conseguimos where it's even more complicated because students have to add themselves to my class, my digital class. So I've given them step by step instructions. I've done it for recording themselves. So how do you do that? Well, one way that I did it besides doing bulleted or numbered instructions, I actually created on the iPad screen recordings, and I would show them step by step almost like mini tutorials of how to create your recording upload. (Sam)

Sam provided a document that exemplifies this step-by-step teaching practice for introducing a new digital platform which can be used as a guide for engaging with the technology platform and completing the related lesson (see Figure E1). The participants acknowledged that students need to have ample practice and to demonstrate, through the completion of several assignments, a better understanding of how to use a particular digital tool. As Kasey stated of this iterative process: "And anytime we introduce a new topic, if there's something different I can use…I like to show them how to use different tools that they have available…I would expect them to be even better at using [them]…and once they've mastered that, I can move on to a new technology." New tools

can then be added to students' repertoire once mastery is demonstrated. Specific and focused instructions give the needed support to help students find success as they are completing assignments and projects using digital tools.

Overcoming obstacles, such as making mistakes, or trouble-shooting technology issues are also an important part of digital literacy. The participants understood that students will come across connectivity issues, online platform malfunctions, or uncertainty about how to use certain programs. Therefore, one teacher discussed how she taught the problem-solving skills necessary to deal with digital setbacks and to resolve them independently.

> My students learn how to troubleshoot on various types of websites…So we actually work with the students on like, what are the basic things that you should try first before you call over a teacher to troubleshoot for you…that they're not calling when their computer just needs to be rebooted. But it is also important for digital literacy, because you should be able to do the basic thing of rebooting your computer, turning [it] off…like exiting out of the browser, letting your computer sit off for 30 seconds, things like that. Re-connecting to the internet on your own things along those lines, not just the second something isn't working, throwing up your hands going: I don't know what to do. (Leslie)

Here we see how Leslie taught her students to solve problems with their devices and online tools or software. She provided students with steps to troubleshoot common issues to give them the confidence needed to solve technical issues. Her students were also encouraged to follow these steps before asking the teacher for help. The participants

acknowledged that for students to improve their digital literacy skills, students need to employ effort to work through technology struggles.

Furthermore, digital literacy skills involve learning responsible use when interacting with others and when engaged in online learning. Likewise, complying with the rules of digital citizenship, or netiquette, protecting one's own and others' privacy and security, and recognizing and responding to dangers that may arise are also important digital literacy skills (Ng, 2012). Two participants provided examples of how they teach their students how to be good digital citizens:

> I try to teach them digital citizenship a little bit to where I do not respond to emails after eight o'clock, because I don't want to work after eight o'clock. It's not anything else, but it's just I'm not working…So by having teachers that are more connected to technology, it's going to help students with their own technology skills. And I think the citizenship is even more important than the skills because it's so easy to get lost anywhere on the internet, especially through social media. And not know when to turn things off. (Kasey)

> I have them create their own website. So I do talk to them about ownership, copyright Infringement, but also how to post their own work online safely. So they're protecting themselves as far as names because most of them are under 18. But also so that [their] work isn't stolen. (Vanesa)

Digital literacy involves learning many skills and becoming proficient using various technology tools safely. Moreover, digital literacy addresses the appropriate use of digital tools and demonstrates proper digital citizenship. Thus, the participants provided

examples of how they directly teach and demonstrate for students the skills they need to succeed in a digital learning environment.

Casting the Net

The inclusion of technology in the educational environment, specifically in the virtual learning environment, provides many advantages to teachers as they work to broaden students' educational landscapes. Specifically, it offers possibilities for bringing about changes in instructional activities, provides access to an almost unlimited supply of learning materials and information, it "eliminates space-time limitations," (as cited in Irwansyah & Hardiah, 2020, p. 356) and enables students to engage in new and enriching collaborative learning experiences (Casal, 2007; Fitriyadi, 2013). Moreover, technology provides many opportunities to apply what has been learned in the classroom to a global context: to interact with others outside of a classroom, a town, and even a country. The participants described opportunities provided to students to help them move out of their comfort zone and engage in real-world learning experiences. Sometimes this included interacting with students globally, using well-known social media tools and apps. Other times this included using social media to learn about current events related to the course content. Learning these skills has the potential to prepare students to interact with these technologies in college and career.

> My students, they do a global stem partnership with Israeli students…And so they extract DNA from insects here and over in Israel, and we look for a bacteria called Wolbachia, that in mosquitoes can block dengue and Zika…And so the kids learn how to extract DNA, look for the specific, you know...sequences present for identifying the Wolbachia…And then they have to set up using

WhatsApp conversations and times with the Israeli students to work in groups...

It's definitely real world learning. And they learn about the cultural differences.

(Marie)

We use Twitter to look for where earthquakes are happening. And a lot of kids

were using Twitter more effectively than kids are using other social media now

and kids seem to be mainly focused on the visual ones like Instagram, even more

so than Snap or Tik Tok. So it turns out researchers were actually using Twitter to

identify the locations of earthquakes. So that really motivated me to continue to

think, how is science communication happening, especially since 2016…I use a

lot of Google Maps, a lot of Google Earth. And some of the applications that

researchers have developed to project sea level rise, and project, you know,

changes in climate, and compare regions and compare states. So there's a lot of

those kinds of activities that we do in order to look at the like, be able to see the

world. (Kent)

Marie also shared how her students use Twitter, LinkedIn, and other social media

platforms to find mentors and to network with potential employers. She explained:

I make the kids have a professional Twitter account and a LinkedIn, because I

told them to think of LinkedIn as their own resume that everyone would see. And

they should put things on that for the resume. And scientists use Twitter. So a

scientist is much more likely to answer your question when you give them social

media credit for it…and connecting them with other resources, as well as Skype A

Scientist, which is a really important communication tool, because then scientists

come into the classroom through Zoom, and the kids can talk to them ask

questions, and because they've signed up for it, it's already the people that are

engaged in doing the outreach…And I get a lot of mentors out of that, which is

nice. (Marie)

As seen here, these experiences, involving technology, go beyond the walls of the

traditional classroom setting. Marie provided for collaborative learning experiences with

students around the globe. Both Marie and Kent offered ways to extend learning to real-

world situations or to solve real-life problems. Finally, Marie helped her students build

connections to professionals in specific fields which could positively impact an

individual's future. As teachers instructed their students in a remote, virtual environment

it was necessary to provide learning opportunities that would keep students engaged in

learning the content, connected to other students, and continually improving their digital

literacy skills.

Digital Breadcrumbs

The transition to remote instruction provided some benefits as the participants

saw opportunities to address students' digital literacy needs. Specifically, they saw

remote instruction as an occasion to help students both improve their digital literacy skills

and to access instructional content through the virtual learning environment, in some

cases, using new virtual learning platforms. One teacher found that remote instruction

had some benefits as it related to students' competence with technology. He explained:

We were doing a lot more videos, and the kids were making videos, so now I can

say that they're taking before and after pictures, and they're seeing their work. The

one thing that I've noticed from it, as they're spending more time, they're getting

more acclimated with the terminology and everything else. So I say that the

digital learning has helped them drastically that way. (Adam)

Thus, with the sudden broadening of digital tools for teaching and learning, he found

there to be some positive effects for his students.

Other participants found that by switching the focus or the goal of a lesson

slightly, they opened opportunities to help students become better acclimated with tools

to which they had previously been introduced.

I was trying to emphasize more data collection stuff, because if you have a

simulation, you can effectively run a lab infinitely, but you could just be like, hit a

button, you'll get a huge amount of data on some concepts like enzymatic

processes or something like that. And the idea was Okay, you can export this

stuff, put it into Google Sheets, and actually run more stats. So it was a shift

toward data analysis…let's use, let's use Excel for something more than just

organizing a bunch of boxes. Let's learn how to plug in a formula, determine

standard deviation, which is the click of a button and try to figure out what that

means. (Lionel)

I stopped doing dialectical journals in English and I started creating reading

notebooks using Google Slides. I'd asked them to do it in a way that really

showed me their thought process. And then after that, create a fun Instagram post,

like something fun. And it was really like visually appealing. I could put pictures

in and, and fun text and fun colors. And then the kids liked that format better,

because they could take one slide at a time and it was finding out the presentation

of that matters to them. They're not only now doing the English part now, they're

like learning how to customize Google Slides. (Bettie)

Therefore, simply by tweaking the goals of a lesson, or modifying a lesson slightly,

teachers were able to find opportunities for their students to gain more practice using

familiar technologies to further develop their digital literacy skills.

Other participants also embraced remote learning as an opportunity to address

students' digital literacy needs, whether by teaching them how to use new platforms or by

working to improve their digital comprehension. One teacher explained how she

introduced her students to new digital tools, and in using those tools, made part of her

instruction about digital literacy and not just her course content:

I definitely introduced new platforms. It was sometimes an entire period of okay,

we're going to use this platform. So let's play around and learn how the platform

works. Definitely conversations about how to use different tools, what's safe to

use. You know, rather than being a lesson [about content], having it be an

application. I'm not just teaching you about fake news. We're going to apply an

understanding of bias in online sources to this particular project. So I think I had

more opportunities to apply digital literacy skills to instruction. (Stefi)

By providing opportunities for students to practice building these digital literacy skills,

which can be transferred into other learning activities and other content areas, teachers

were attempting to help their students become better learners all around.

As demonstrated above, the participants used the transition to remote learning to

address their students' digital literacy needs while also making the virtual learning

environment more engaging and accessible to their students. The teachers not only

provided access to the content, but they provided opportunities for students to improve their digital literacy skills, so they would be better prepared to use new technologies and platforms in an unfamiliar remote educational setting.

Discussion

The findings from this study illustrate the diverse ways in which secondary school teachers promote a growth mindset among their respective students and are integrated within digital literacy instruction. The findings further exemplify how the transition to remote learning was used as an opportunity to address students' digital literacy needs. Although there has been much individualized treatment of growth mindset and digital literacy, this study provides a fresh perspective on the ways in which growth mindset practices can be used to develop students' digital literacy skills. Similarly, as the virtual learning environment brought with it a renewed focus on educational technology and its uses and applications for instruction, this study offers insight into the ways in which the continued use of these technologies can address students' growing digital literacy needs.

Growth Mindset Practices

The findings from this study reveal an explicit and purposeful implementation of growth mindset embedded within teachers' instructional practices, specifically in the ways in which teachers communicated growth minded messages to their students. These findings build upon previous literature which suggests that teachers' practices are essential in supporting students in developing their own mindsets and thoughtful processes to support their learning (Seaton, 2018). Moreover, research conducted by Hattie (2012) found that teachers' classroom practices had a significant effect on student learning, specifically as it relates to types of feedback and the visibility of teaching and

learning. This study highlights the emphasis teachers placed on incorporating growth mindset messages to celebrate students' mistakes as well as to celebrate students' success. Such messages have the potential to positively impact how students perceive their own abilities and their motivation to embrace new learning opportunities in school (Yeager et al., 2019).

This study also revealed how teachers' created an atmosphere of support and encouragement to help students as they experienced failure and challenges to their learning by inspiring students to put forth the effort needed to succeed. The participants celebrated students' mistakes and wrong answers and used them to build bridges toward new learning. Such practices are supported by previous research which found that commending students' effort and emphasizing the process of learning will promote a greater willingness among students to embrace challenges and focus on intrinsic rewards, such as knowledge and understanding (Dweck, 2007; Mueller and Dweck, 1998). Indeed, the participants' adherence to practices promoting a growth mindset shaped their responses to their students' difficulties and struggles within the learning environment. The teachers promoted student learning through these challenges by providing strategy-based responses and support to help students increase their effort to improve their performance (Rattan, et al., 2012). While this study did not investigate the impact of teachers' growth mindset practices on student learning, related research (Hattie, 2012; Bonne & Johnston, 2016) would suggest that the participants' practices would likely result in students reaching higher levels of academic achievement.

It is also important to understand what this study suggests about the participants' own growth mindset beliefs. The teachers in this study, not only promote a growth

mindset among their students, but it appears as though they also personally embody these beliefs. Previous research shows that teachers' beliefs relating to growth mindset strongly influence their pedagogical practices. Specifically, teachers with a growth mindset provide their students with exploratory tasks that encourage diverse thinking, innovation and personal development (Blackwell et al., 2007; Butler, 2000). Likewise, growth minded teachers are more likely to provide their students with differentiated instruction and scaffolded learning opportunities in the pursuit of high, but achievable learning goals (Swann & Snyder, 1980; DeLuca, et al., 2019). The practices highlighted in this study seem to reveal deep-seated growth mindset beliefs amongst the participants, influencing the way they engage and support their learners. This suggests that such beliefs are necessary for teachers to consistently promote growth mindsets in their instructional practices.

Growth Mindset and Digital Literacy

The findings of this study also revealed that the participants are quite knowledgeable when it comes to providing digital literacy instruction to their students. Research suggests that providing digital literacy instruction involves furnishing students with the skills to find and understand information and data, to communicate and collaborate with peers, to create digital content, to follow appropriate safety guidelines, and to solve problems and issues related to technology (Carretero et al., 2017; Eshet-Alkalai, 2012; Ng, 2012). Indeed, the participants provided direct instruction to introduce digital tools and platforms, such as Class Dojo, Desmos, and Flipgrid among others. They gave students opportunities to practice using those tools and platforms by assigning them numerous tasks and projects. Such practices provided students with the opportunities to

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experience success, both with teacher guidance and independently, making it possible for them to gain the confidence needed to use the tools to access content and to complete learning activities.

This study also uncovered the ways in which the participants seamlessly incorporated their growth mindset practices into the development of students' digital literacy skills. Previous studies suggest that acquiring digital literacy skills lends itself to having a particular mindset that can adjust to the novel requirements imposed by ever-changing technologies (Coirro et al., 2008). As highlighted above, a growth mindset is one that rewards challenge-seeking, embraces mistakes and failures as part of the learning process, and focuses on effort and the process of learning. The digital technologies used in education as well as the digital literacy skills students are expected to learn are numerous and diverse. As educators seek to develop their students' digital literacy skills, a growth mindset could allow students to adjust to the demands of learning not only the various technologies, but also the many requisite skills required to navigate and operate within those technologies. Research is needed to explore how growth mindset practices can be explicitly integrated into digital literacy instructional programs and its effectiveness on students' digital literacy development.

The Transition to Remote Instruction

Despite the difficulties inherent in the sudden and unexpected transition to remote learning, this study highlighted how teachers used the transition as an opportunity to address students' ongoing digital literacy needs. Since the participants were already familiar with and consistently used technology as part of their typical instructional practices, the remote learning environment provided an opportunity to not only improve

those practices, but to experience engaging their students in distance learning, a novel task for many teachers. Research on distance learning describes it as a forum which provides students with choices conducive to their unique learning needs and personalized instruction that fosters effective instructional processes (Engelbertink et al., 2020).

Moreover, distance learning has the potential to promote the creation of new understandings based on diverse pedagogies and learning resources (Blau, et al., 2020) and to promote the development of collaborative skills (Blau, et al., 2020; Huang et al., 2020). The transition to remote learning, therefore, provided a unique opportunity for teachers to continue to develop and improve their students' digital literacy skills while immersed in an environment that required the use of technology, not just as a tool for learning, but as the only available forum for instruction. Indeed participants took this opportunity to modify and improve their instructional strategies to make them suitable for remote learning, introduced students to additional learning platforms, improved students' knowledge and usage of the technologies with which they were already familiar, and created opportunities for students to creatively use technology for projects and presentation. While these strategies appear to be effective, future research could lead to the design of instructional approaches and practices to improve remote learning for students.

Implications for Future Remote Learning

Although the COVID-19 crisis may be behind us, a great deal of time and money was invested into developing and implementing an infrastructure to support teachers and students during remote learning (Hodges et al., 2020; Huang et al., 2020). This has included providing laptops and hotspots to students (Lieberman, 2021) and adding an

array of digital platforms, such as Google Classroom and Canvas (Pokhrel & Chhetri, 2021), as well as those discussed by the participants in this study. Given this development, we owe it to ourselves as educators, and to our students, to continue to work to improve the use of technology in instruction and to improve our understanding of effective remote teaching practices (Asare et al., 2021). Moreover, we must continue to develop and implement digital literacy programs throughout K-12 education, so that we can continue to improve our students' digital literacy skills (Ting, 2015). Continued attention to the benefits of remote learning could lead to among other things virtual options during inclement weather, keeping students connected when they have a prolonged illness, and providing asynchronous instruction or online tutoring for students who have to travel with their families. Additional research and recommendations are needed to prepare educators for the possibility of future remote learning and the enhancing education through the use of the new technologies that have been adopted during the COVID-19 pandemic.

Conclusion

There seems to be a great deal of promise in using instructional practices that promote a growth mindset for teaching digital literacy skills instruction. This research is one of the first to offer insight into the combination of these two practices. It makes it clear that teachers' growth mindset beliefs and practices as well as their knowledge of digital literacy plays a crucial role in their direct digital literacy instruction, especially in the remote learning environment. Likewise, it is apparent that more research is needed in order to determine which instructional strategies are most effective, especially as the need

for remote learning continues, and the impact of remote learning on students' educational achievement is yet to be fully understood.

Chapter 6

Is Ignorance Really Bliss? Adverse Assumptions About the Digital Divide

Who has not at least heard the term digital divide? This crisis has been discussed since the late 1990s as technology and the Internet have become a large part of our society and our educational system. The digital divide essentially refers to the division between those with access to technology and those without, the haves and the have-nots. At the time this term was first defined, it had already become one of America's chief economic and civil rights issues (National Telecommunications and Information Administration, 1999). Further research into the digital divide over time, has led to its being defined as disparities among individuals relating to access to technology, the ability to effectively use technology, and the future benefits of technology use for adults (Osborne & Morgan, 2016; Tierney & Kolluri, 2018; Lutz, 2019; Scheerder, 2017). Likewise, research has identified the role that education and instruction plays in narrowing the digital divide. Although the digital divide has primarily been associated with socioeconomic factors, this article will discuss a new facet of the digital divide. This new dimension relates to the tension that exists between teachers' assumptions about students' technology skills and their actual ability to transfer those skills to virtual learning in the remote learning environment.

The impact of the COVID-19 pandemic on education and the resultant transition to remote instruction has given rise to new understandings of the digital divide. Students attending schools in underfunded urbanized centers and rural districts have faced the greatest impact by this sudden change to remote instruction. The COVID-19 pandemic has further intensified these inequities. Herold (2020) described how far-reaching gaps in

the nation's technology infrastructure have left millions of disadvantaged students without reliable internet service with which to access academic content. Moreover, some schools did not have the available devices to provide to all of their students (Herold, 2020; Perrin, 2019). These factors left many students unable to receive the continuity of instruction being provided to their more privileged peers (Correia, 2020). In some more advantaged districts, however, where students were already provided with individual laptops, it was much easier to transition into the remote learning environment (Kolb, 2021). Likewise, in many districts, the use of educational technology was prolific, and it was used daily in teachers' instruction; thus teachers remained comfortable with the use of technology in virtual learning. Moreover, as the crisis continued, school leaders worked to provide students with laptops, and in some cases Internet hotspots. These decisions and activities often took place behind the scenes, removed from the view of individual classroom teachers. Nevertheless, such circumstances, specifically, the sudden switch to remote learning, make it difficult for teachers to overlook the existence of the digital divide.

So, I return again to the question: Who has not at least heard of the digital divide? Well, it seems that this is a concept stymieing many educators now confronted with the need to employ digital technology more fully in order to provide their students with remote virtual access to daily instruction.

Teachers' Understanding of the Digital Divide

In the fall of 2021, as part of our study on digital literacy, and experiences during remote instruction, we explored what New Jersey public high school teachers knew about the digital divide. Surprisingly, almost half of the study participants did not know

anything about the digital divide. One teacher shared "I don't know anything. I've never heard that phrase." Several participants proffered a guess that it related to generational differences between users, specifically, digital natives versus digital adopters. Still others surmised it had something to do with the difference between online and real-world personas. Those who did have some knowledge of the digital divide understood the divide only as it relates to access, but not necessarily use.

While there could be several reasons why one might not be familiar with the digital divide, a justification most commonly shared by the participants was a general lack of experience. Specifically, several of the participants shared that they don't see the digital divide as an issue in their school district. Whether it is simply that students have their own devices, the school provides devices, or they are generally unaware of the access their students have outside of school, the digital divide is simply not a part of their everyday teaching experience. Contrarily, several of the participants did acknowledge a digital access divide among their students during the transition to remote learning. They spoke about there being limited devices available for all of the students in a particular household. Moreover, some participants spoke about students having a lack of consistent Internet access or the bandwidth to support the number of devices or applications students needed to use to access live instruction or complete their homework assignments. They explained that some students could log onto a meeting, but would not be able to actively participate in a discussion while others were continually disconnected from meetings. Additionally, some students could not download their lessons and activities and would have to complete and submit them outside of school hours.

There may be numerous educators who are unaware of the divide because it seemingly does not exist in their school, due to its pervasive invisibility. Other educators may be aware of a divide, because of their experience, but only understand it as it relates to access. By the same token, many teachers expressed that they have had limited opportunities to learn what the digital divide is or how it can be narrowed. Very few educators would be aware that the digital divide also refers to an ability to use technology to learn digital literacy skills. It is important to understand that digital literacy is more than just the ability to operate hardware and software (Mossberger et al., 2003), rather digital literacy is the ability to use digital tools and facilities to identify, manage, and analyze digital resources, construct knowledge, create new information, and communicate with others (Martin, 2005). Such lack of knowledge contributes to the persistence of the divide. This is certainly something that needs to be addressed if we are going to start to narrow the digital divide and create equity in our students' access to technology and their knowledge of how to use it.

The Tension Resulting from Digital Assumptions

Regardless of what teachers know or do not know as it relates to the digital divide, one idea that was consistent across the board was the difficulty students had transitioning to remote learning and using digital tools and digital platforms to access educational content. However, there was a sense that students should be better at learning remotely; they should have adapted better than they did. Because students today are digital natives, they have grown up with a great deal of technology, they began using technology at a very young age, and they have been exposed to educational technology for the entirety of their school career, it seems to be a fair expectation that students would

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naturally and seamlessly transition into remote learning. This is not what happened. Students across the board did not transition well into remote learning. Most students across the country struggled, fell behind, and continue to suffer from the learning loss, referred to as the COVID slide, experienced during the peak of the crisis (Kuhfeld et al., 2020).

Several teachers interviewed reported that, despite their beliefs about students' knowledge of digital literacy skills and abilities to engage and interact with digital platforms, many students did not transfer these skills to their online learning experiences; instead, in many ways, they seemed disengaged from the learning environment and continued achievement, which resulted in learning loss, including failures and retention. There seems to be a definite separation for students between their willingness to use technology socially, or for entertainment, and their ability to use technology for education. Additionally, other teachers acknowledged the level of support and hand-holding students required just to navigate the online platforms or to follow the directions for completing assignments. It is clear that regardless of students' abilities to navigate the technology they choose to use, learning remotely and using new platforms poses significant challenges for students.

Many teachers in our study worried about students being addicted to their devices, yet not knowing how to use them for practical purposes or to locate tools for learning. There is a general disconnect between students using their devices for social media or entertainment apps, and students using devices for learning. Teachers also cite technology as one of the reasons students cannot problem solve. Even though students have had devices their whole lives, if something is not working correctly on a device,

students do not know how to troubleshoot the problem and resolve it themselves. They have grown accustomed to being able to just give their device to someone else and let them do the work to solve the problems. It seems clear that this issue will not resolve itself on its own and the longer students have access to support that removes the responsibility of problem solving from them, they will continue to seek help rather than trying to solve problems. Being a digital native does not necessarily make for an effective learner. The truth of the matter is students are not required to use critical thinking skills to engage with these entertaining digital applications as most of them are intuitive to use. However, activities such as using the virtual learning platforms, conducting research using the Internet, organizing and presenting new information, problem solving, and collaborating with peers online does require critical thinking (Martin, 2005). As a teacher, then, it is important to realize and understand that the technology students are using is not the same technology we want them to use in the instructional environment.

Indeed, teachers do have an expectation that their students come prepared with a certain level of digital literacy knowledge. Many of the teachers interviewed in this study discussed their assumptions about students' ability to access and use the instructional technology and educational resources available. In fact, several teachers shared a belief that students are better able to use technology than they are. Others highlighted the various social media outlets and games with which students seem to have little difficulty engaging. Such assumptions sometimes result in less direct instruction of new technology and how to apply it to learning, leading to expectations that students can figure it out. When these skills are taken for granted, students do not get the support they need in navigating new platforms to access course content. This obviously frustrates students,

causing them to disengage from the learning environment; a phenomenon experienced far too often during the transition to remote instruction.

Therefore, educators need to be prepared with the knowledge that there is a divide between what students can do with technology and what they are expected to do to learn. Likewise, there exists a divide between the ability of students to transfer their knowledge to put forth the effort to learn remotely since it requires additional hard work and problem solving on their end; it requires them to be self-directed learners in both learning the technology and learning the content. Without recognizing the superficiality of the digital literacy knowledge with which our students are prepared, we cannot be surprised by their disengagement when it comes to using it for learning, especially for learning remotely.

Narrowing the Digital Divide: Supporting the Development of Digital Literacy

Whether talking about the long-established digital divide, or the issues raised here respecting the tension created from teachers' assumptions about how students should be able to use technology and students' actual digital literacy abilities, knowledge about the existence of the digital divide, specifically what it is and how to address it, is needed among educators. As a response to the COVID crisis and the continuing need for remote instruction, many districts have already taken steps to resolve access issues. As mentioned previously, districts have worked to provide their students with access by issuing laptops, and in some cases, access to the Internet through the distribution of hotspots. Therefore, the next step is improving students' digital literacy skills. Below are key recommendations for narrowing the digital divide through the support of digital literacy development among students in K-12 contexts.

Recommendation 1: Designing for Digital Literacy

School administrators should provide professional development that clearly defines the digital divide and the impact the digital divide has on the school district. Data should be collected from relevant stakeholders and used to understand how the digital divide impacts students and their families. The data can also be used to provide support for families impacted by the digital divide. Such support may include providing devices to students, assisting families in accessing free or low-cost Internet, providing individual hotspots for students to use, and offering workshops that teach families how to support students in using educational technology and accessing instructional content through digital platforms. To ensure digital literacy instruction is well understood and implemented, district leaders must commit to improving digital literacy as part of their annual district goals. There should also be an expectation that teachers adopt improving digital literacy instruction as part of their professional goals. Therefore, teachers and school leaders must work together to design courses and programs that focus on improving students' digital literacy skills and that are appropriate for students at each academic level.

Recommendation 2: Embedding Digital Literacy Instruction

Whether it be a full class or embedded into the curriculum of each content area, teachers must be prepared to provide direct digital literacy instruction to students. Such instruction must include teaching students how to engage in basic computer operations, such as typing, troubleshooting issues, and navigating the instructional platforms needed for everyday use. Teachers must provide instruction to students that allow them to use the Internet for research. Teachers must instruct students on methods of searching for and

identifying accurate, reliable information that will enable students to complete tasks, solve problems, and create materials that present new understandings. Teachers must help students use available online tools for organizing their work, using the calendar to keep track of deadlines and due dates, and using collaboration features to assist in completing group assignments and projects. Finally, teachers must provide instruction that helps students manage their digital footprints and netiquette, so they are prepared to behave appropriately in online communities and to protect themselves and their peers from potential harm. (Ng, 2012).

Recommendation 3: Developing Digital Literacy Professionals

In order to support teachers in this effort, teachers should have access to a variety of educational technology and learning platforms that are designed for use in their specific content areas. School administrators must offer focused professional development and training designed specifically to prepare teachers to use these tools as well as to provide digital literacy instruction to their students. Such professional development can be organized and facilitated by teachers who have the practical experience and knowledge of different educational technology tools, learning platforms, and digital literacy instruction. Moreover, teachers can be organized into professional learning communities (PLCs) in which they create models for digital literacy instruction that can be shared with fellow teachers, and that include specific lessons for use by teachers from each of the content areas. District leaders can also invite technology professionals and coaches to work one-on-one with teachers in their classrooms as they provide digital literacy instruction to their students and as they implement new educational technologies into their teaching practices. Teachers should be encouraged to

seek and attend professional development opportunities from their own professional organizations of which they are members.

Whether school districts implement all or some of these strategies, digital literacy instruction must be a priority if we hope to improve students' digital literacy skills, enhance continued virtual remote instruction, and begin to narrow the digital divide.

Conclusion

With the emergence of remote instruction resulting from the COVID-19 pandemic, the digital divide has become an even greater issue, having perhaps more profound and far-reaching consequences for students' learning than it did before. Many students, due to their lack of access to both devices and consistent, reliable Internet, have been denied the sustained level of instruction accessed by their more privileged peers. Nevertheless, students, across all grade levels, regardless of the demographic disparities they face, have suffered tremendous learning loss as they struggle to stay engaged and continue learning in the virtual learning environment. Unaware of the digital divide and its far-reaching consequences, many teachers maintained assumptions relating to students' perceived abilities in technology use and digital literacy. Such conclusions have resulted in an over-reliance on students' abilities to seamlessly adapt to the remote environment and to maintain their motivation to continue learning. Despite these negative consequences, the transition to remote learning has also shone a light on what is needed. We have an opportunity to use what we have learned during this experience to improve students' digital literacy. We must use this opportunity to focus on improving teachers' knowledge and understanding of the digital divide and its impact on students' learning. We must design digital literacy programs in our schools and make it a priority to improve

students' digital literacy skills. We must embed digital literacy instruction, not only in computer or technology classes, but across all academic levels and throughout all content areas. Finally, we must ensure teachers receive the training and support they need for them to develop into teachers capable of improving students' digital literacy skills. This will not only assist in students' ability to learn remotely and improve their digital literacy skills, but could also potentially narrow the digital divide.

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Appendix A

Next Gen Personal Finance

Figure A1

NGPF Online Banking Simulation

NGPF | Next Gen Personal Finance

INTERACTIVE: Navigate Your Online Bank Account

Interactive: **NGPF Online Bank Simulation**

Many banks offer an online portal for checking and saving accounts, allowing people to easily keep track of their account(s) activity from the comfort of their own homes with a computer or smartphone! In this activity, you will use a *simulation* to practice navigating the features of an online bank account, so that you can feel prepared to use your own REAL online bank account!

Note: This is a simulation and you should NOT use any of your actual bank account information at any point.

Part I: Set Up Your Online Account

Congrats on opening your very first checking and savings account last month! And you even deposited $250 into each account from the get-go. Now you're looking to set up your very first ONLINE ACCOUNT!

- ❏ Open up in a new tab: NGPF OnlineBank Simulator

- ❏ Click *Create a Free Account* at the top right.

- ❏ Fill in the form to register for your OnlineBank Sim account
  - Make sure you choose a username and password you can remember.
  - There are some fields that have been filled out for you for privacy purposes and cannot be changed (ex: address).

- ❏ At the bottom of the form under ALERT section, click the ✅button for: *IF THE CHECKING OR SAVINGS ACCOUNT FALLS BELOW: 200.*

- ❏ Click SUBMIT

- ❏ Log in using your new account details you just set - it's time for some online banking!

Part II: Check that Checking Account

Now that you have your online account details all set up and you are successfully logged in, let's practice looking at the basics of your account!

- ❏ In the upper right, set the SIMULATION DATE to January 17, and push `GO`
  - In real life, you can't really set the calendar forward / backward, but for this simulation activity, we will "time travel" to practice looking at the same information!

- ❏ Click on ACCOUNT ACTIVITY.

1. You'll be brought to a page of all transactions that occurred in your *checking* account from Jan 1 to Jan 17.
   a. What is your current balance in the Checking Account?
   b. Is it more or less than you started the month with?

2. To get in the full swing of things with online banking, you set up *direct deposit* with your job at Burger Bucket. You want to verify that it's working correctly and you know that you're supposed to be paid **twice** a month.
   a. How can you tell that your direct deposit works correctly?
   b. What days did you receive your pay?
   c. How large was each deposit?

3. What fee(s) have you incurred on your account so far? How could you prevent them from happening in the future?

4. You want to make sure your account reflects the spending you've actually done, so you pull receipts out of your clothes pockets from the last two weeks and find two for Cool Snacks, one for Club Cafe, one from a sale at Clothing Rack, and an ATM slip for a withdrawal of $30.
   a. Are there any items reflected on your Account Activity that you can't account for? What are they?
   b. What are 2 possible explanations that *might* explain for the extra entry?

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You're working part-time, you've got your own bank accounts… It's time to finally subscribe to online streaming TV and movies from GetFlix at a monthly cost of $11. You can't be bothered to remember to pay your bill on-time every month, so you want to set up auto pay!

❏ Select PAY A BILL on the left menu

❏ Follow the prompts onscreen to set up auto payment.
- *Recipient:* GetFlix, 2000 Maple Street, Anytown, PA 15068.
- *Payment:* Your payment is **due** the first of every month.
  - ★ **NOTE: It will take 4-6 business days to process your payment request.**

5. For what date did you set your first bill pay to GetFlix?

6. Why is it important to know that it will take 4-6 business days to process your payment request?

Part III: Switch Over to Savings
Now that you've gotten a good look at your checking account, let's switch over to your savings account.

❏ Click ACCOUNT ACTIVITY on the left navigation menu.

❏ Then, click ACCOUNT ACTIVITY on the drop down menu.

❏ Select SAVINGS on the pop-up box

PAY YOURSELF FIRST!

7. What's happened so far in your Savings Account?

Hmmm, thinking back to your personal finance course, you remember you should…PAY YOURSELF FIRST! By paying yourself first ,you are regularly contributing some of your income to your Savings Account.

❏ Use the MAKE A TRANSFER feature to move $35 from your Checking Account into your Savings Account.

8. How much is in your Savings Account now?

9. What is the new balance in your Checking Account?

_____

Part IV: Fast Forward a Few Months!
It's time to skip to a few months in the future (at least for this simulation activity)!
- ❏ Change the SIMULATION DATE to **May 17** and push GO

- ❏ Log into your Savings Account

10. Describe what transactions you see in your Savings Account since opening it in January.

_____

11. You intended to "pay yourself first" with $35 into your savings account every month, but it looks like that's not happening regularly. What could you do to fix the problem?

_____

You've just gotten your driver's license, and your parents say you're responsible for paying NoRisk Insurance Co (4000 Maple Street, Anytown, PA 15068) a $250 premium payment in order to be added to their account. The sooner you pay, the sooner you can start driving. You'll need to pay this amount every 6 months.

- ❏ Use PAY A BILL to make the payment today (be sure to set the bill pay calendar to today's date, May 17).

12. Did you set up a Single or Monthly payment? Why did you make this choice?

_____

13. UH OH! You receive a text on your phone telling you to check the NOTIFICATION zone for an important alert. Head there now. What do you see in your notifications?

_____

14. You're worried about your Checking Account balance, so go check your ACCOUNT ACTIVITY. **Should** you be worried? Why or why not?

_____

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15. Give one short-term and one long-term priority you have for your online bank accounts. Explain why you chose these goals and how you plan to achieve them.

Figure B1

Gmail Overload

Is your Gmail inbox confusing? Overwhelming? Out of control?
Do you often miss the important emails sent by your teachers?
We are going to work on that today.

You will create Filters in Gmail so that your inbox won't overfill again.

A. At the top of the screen is a Search bar with a little magnifying glass.
    a. Click on the little **down arrow** on the right side

    b. Next to **From** type this: *Teacher's Name* **@classroom.google.com**
        i. DO NOT CHOOSE FROM THE DROP DOWN MENU
    c. Next to **Doesn't have** type this: **Announcement, comment**
    d. In the bottom right corner of the box, click on the words **Create filter**

B. In the pop-up menu, click the boxes next to
    a. Skip the inbox (Archive it)
    b. **Apply the label**: Choose Label
        i. In the pop up box, **click Create New**
        ii. In the box under **Please enter a new label name:**
            1. Type this: *Name of Class* **Classroom**
        iii. Click **Create**
    c. Click on the **Create filter** button

Repeat these orange and red directions for each of your classes.

Now the only emails you will see in your inbox from Google Classroom will be when your teacher posts an announcement in Stream or if your teacher writes a comment on an assignment.
    Make sure to READ every email that comes into your inbox from now on. After you read, move them to the label for that class by **dragging the email to the label on the left side.**

Appendix C

Participants

Figure C1

Participant Demographics

Participants	Subject	County
Gail	Speech & Language Pathologist	Sussex
Adam	Automotive Technology	Camden
Sorina	Special Education	Cumberland
Cal	Science	Camden
Ella	Math	Mercer
Marie	Authentic Science Research	Ocean
Tina	Math	Atlantic
Duane	Science	Camden
Lionel	AP Seminar/AP Research	Bergen
Kent	Science	Camden
Hortense G. Abilone	Math	Ocean
Mica	History/Government and Politics	Bergen
Job	Financial Literacy	Monmouth
Stefi	STEAM	Monmouth
Kasey	Science	Ocean
Leslie	Special Education	Mercer
Donna	Math	Atlantic
Liam	Science	Atlantic
Cameron	Economics/Philosophy	Passaic
Vanesa	Photography	Passaic
Rian	Science	Essex
Ramen	English	Mercer
MthIsCool	Math	Burlington
Sam	Spanish	Camden

Participants	Subject	County
Bettie	English/AP Psychology	Ocean

Appendix D

Growth Mindset Instruction

Figure D1

Growth Mindset for Students

Growth Mindset for students - Episode 1/5

4,477,441 views · Jan 19, 2016
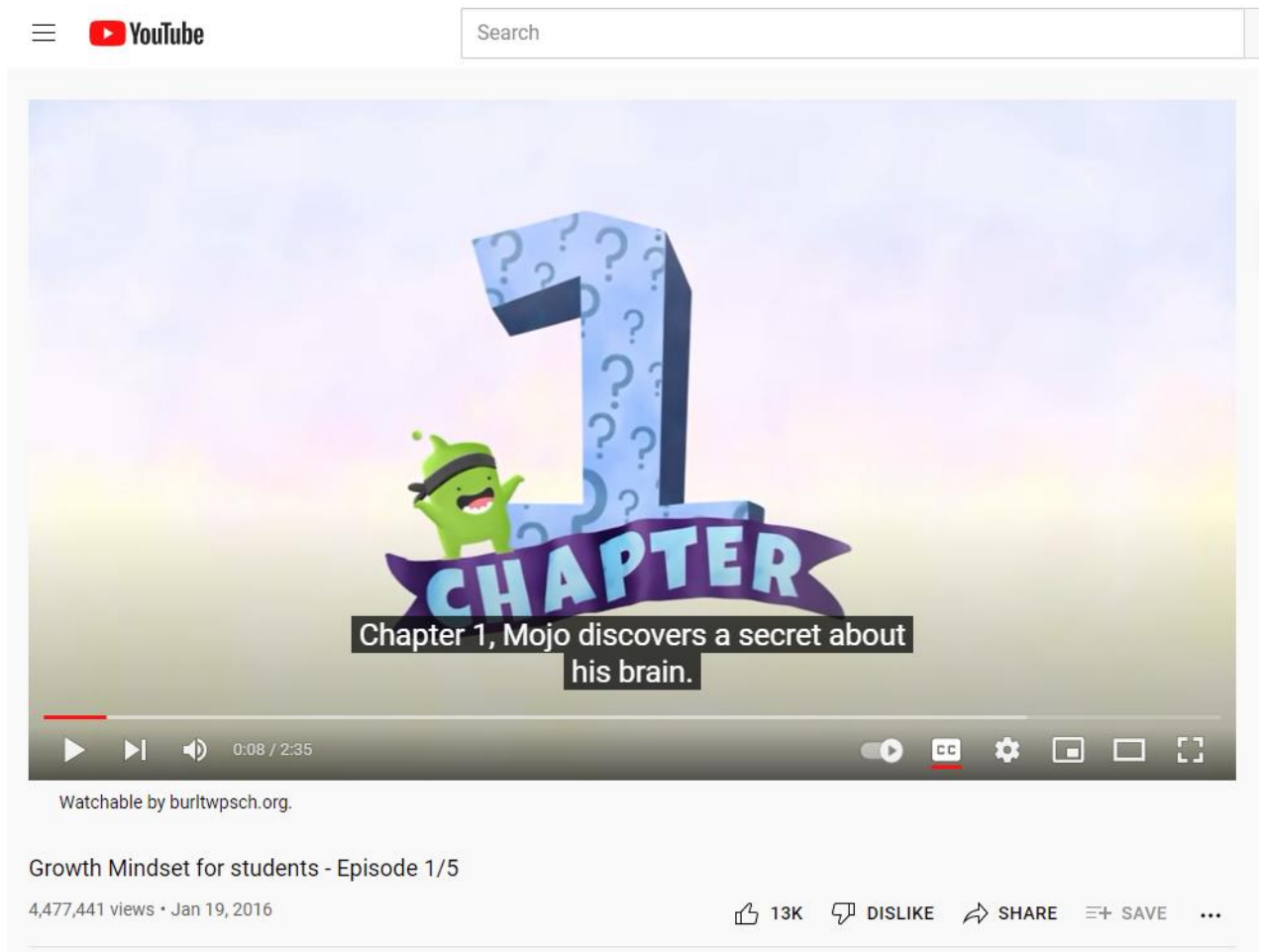
Figure D2

Mindset Card Sort

Appendix E

Technology Platform Instructions

Figure E1

Flipgrid Instructions