ABERNATHY, CHRISTIE S., Ed.D. The Use of Digital Devices with High-Performing Students in Elementary Schools. (2019)
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Encouraging the academic growth of every student is an important part of providing a free appropriate public education in America. Each school should be focused on providing the best education for all of our students, including our top performing who will be competing with other students from all over the world for college entry and career opportunities. This group of high-performing students sometimes do not receive targeted instruction due to their above-grade-level performance on state accountability measures. Additionally, students are surrounded by the use of devices for a large portion of their daily lives. It remains crucial in developing future leaders and productive citizens for schools to engage students and provide strategies for student growth through the use of devices. There are many ways that districts have implemented devices. Multiple studies that I have explored have highlighted positive integrations using technology and there is also research that identifies negative integrations of digital devices in the classroom. There is much research that provides data on specific programs using devices, but little research has been conducted on how devices have been used to provide differentiation. Due to the lack of research in this area, I felt that it would be enlightening to administrators and districts to investigate how teachers are leveraging digital devices in elementary schools in order to provide enrichment for their high-performing student subgroup. Today school systems are spending millions on purchasing devices for each child, therefore it is important for districts to have a strong implementation plan and provide teachers the training they need to capitalize on their investment.

In this qualitative research study, I closely examined a group of teachers who had shown growth on accountability measures with their high-performing students in the elementary classroom. My research examined how those teachers were using one-to-one digital devices in the classroom to provide high-performing students with learning opportunities that offer an engaging learning environment that facilitates academic growth in this group of students. This study included three different schools. I conducted interviews with two teachers in each of those schools and completed observations of their classrooms. I selected the schools due to the teachers being identified in EVAAS as making growth with high-performing students on their state accountability measures. They were also selected because they have integrated one-to-one devices for at least 2 years in their classrooms.

The goal of my study was to identify resources and strategies teachers are using in the elementary classroom with their high-performing students by utilizing devices to help students make growth. Through interviewing six different teachers, conducting observations, and facilitating a focus group session, I was able to identify multiple strategies and resources that are being used with devices. I was able to answer my primary research question by identifying how teachers are using the devices. I also focused on several secondary questions to fully understand how academic content was being delivered, if enrichment was being provided, and if higher-order and critical thinking skills were being taught.

In my research, I found that the teachers who participated in the study are using one-to-one devices to provide differentiated instruction to their high-performing students

through multiple resources and venues. Hopefully the results of this study will prove helpful to teachers and leaders that need ideas on how to grow their high-performing students by preparing them with the most engaging environment by using one-to-one devices.

THE USE OF DIGITAL DEVICES WITH HIGH-PERFORMING STUDENTS IN

ELEMENTARY SCHOOLS

by

Christie S. Abernathy

A Dissertation Submitted to
the Faculty of The Graduate School at
The University of North Carolina at Greensboro
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of the Requirements for the Degree
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Approved by

_____
Committee Chair

This work is in loving memory of my father, Dewey Edward Saunders Jr. who has always inspired me with his drive and will power to never give up. He always taught me to never give up and that I could do anything that I set my mind to achieve.

APPROVAL PAGE

This dissertation, written by Christie S. Abernathy, has been approved by the following committee of the Faculty of the Graduate School at The University of North Carolina at Greensboro.

Committee Chair _____

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Date of Acceptance by Committee

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Date of Final Oral Examination

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CHAPTER I

INTRODUCTION

Historically academic growth for high-performing students has not been studied. "Children differ in capabilities, yet they are being measured with the same yardstick, and group measures lead to unfair comparisons of unequal groups as well as mask individual student differences" (Gentry, 2006, pp. 77–78). The Gentry study states that accountability placing such a strong significance on proficiency measures causes less focus to be on the growth of each child and more focus on trying to get all students to be proficient. Proficiency in North Carolina means that students score high enough on an end of grade assessment to be considered at or above grade level. Oftentimes the focus is on teaching grade level standards rather than providing enrichment or differentiation for students. "Challenge is difficult to experience in a system that promotes grade-level standards and group assessment of these standards" (Gentry, 2006, p. 78).

Some administrators see the value in providing enrichment for these students while others think they are a small part of the population and that the focus should be on children not performing on grade level: "The attitude that education should fix weaknesses rather than develop talents is pervasive" (Gentry, 2006, p. 76). Societal concerns are that high-performing children are not being served appropriately in public schools and that this miscarriage of education will make our society as a whole less

competitive with other nations: "The societal implications of under educating and under developing talented youth in our educational system are sobering" (Gentry, 2006, p. 78).

As long ago as 1983, *A Nation at Risk* examined America's brightest students compared to other students in areas around the world, finding American students were scoring much lower. The report promoted policies and practices that should raise academic standards and promote appropriate curriculum for advanced learners and increase the rigor in American classrooms. I am concerned as a principal that if we do not find creative ways to maximize student potential, then we are not reaping the benefits of what it could produce, and we are not preparing students for the future. "Public schools have been charged with providing students with the knowledge and skills that they need to be productive global citizens in a digital society" (Ritzhaupt, Dawson, & Cavanaugh, 2012, p. 229).

Key Related Concepts

Digital Devices

The use of digital devices to enrich and differentiate instruction is a relatively new concept in the general education classroom. Digital devices may include utilizing iPads, MacBooks, Chromebooks, or laptops where each student has access to an Internet-enabled device. In this study I was interested in looking at how teachers are using digital devices to better utilize instructional time and resources in improving instruction in the elementary classroom. I was particularly interested in looking at how they used digital devices to create enrichment, provide differentiation, increase higher-order thinking skills, and develop critical thinking skills for high-performing students to continue their

educational growth. "One way to modify the curriculum is through an enrichment activity that merges subject matter with curriculum technology" (Mulrine, 2007, p. 38). Digital devices can be used as a resource to provide enrichment. "Technology rich learning environments bridge the gap between knowing and doing, thereby moving knowledge from an inert to an active state as it is applied to immediate problems presented through the technology" (Cavanaugh, Dawson, & Ritzhaupt, 2011, p. 361). It is important for teachers to create an environment that provides active learning for high-performing learners which can be leveraged through the use of technology.

Focus on High-performing Learners

For this study, I defined high performing as:

A student with high ability as one who performs at, or shows the potential for performing at, an outstanding level of accomplishment in at least one domain when compared to other students of the same age, experience or environment; and is characterized by exceptional gifts, talents, motivation, or interests. (Schmitt & Goebel, 2015, p. 429)

Students who have the potential to perform on assessments or in their classroom performance should be receiving the same amount of focus as their gifted peers. "High-achieving students are noticed for their on-time, neat, well-developed, and correct learning products. Adults comment on these students' consistent high grades and note how well they acclimate to class procedures and discussions" (Kingore, 1989, p. 1). Oftentimes educators look at this high-performing group and the academically gifted group as the same group of students. Oftentimes the high-performing group can perform as high on classroom work as their gifted peers just as there are also times where gifted

students may not score as high on performance measures. High-performing students are not always identified as gifted learners but may still benefit from the rigor in order to continue individual growth.

As a parent, I want both of my children to grow. Even though they have shown high performance in each grade level, it troubled me when my daughter was in elementary school she did not make the gifted program cutoff in our district by one percent on an achievement measure. I tell this story because as a principal I feel this happens to many other students who are high-performing in the classroom but may not show their performance on standardized testing. As an educator who felt strongly about her not receiving the same rigor as her gifted peers, I helped provide her with more enrichment and was an advocate for her in seeing that she eventually qualified. This experience also made me become an advocate for the group of students that may not have a mother as an educator who knows how to provide a child with the reading materials and enrichment activities to foster that intelligence. I strongly feel that many students go un-identified in our schools and it is just as important for those students to receive the same rigorous learning experiences as their gifted peers.

There have been multiple studies conducted on gifted students, but very few studies have looked at high-performing students. Therefore, as a principal and former teacher I began researching ways to improve instructional practices in the classroom to help teachers provide our high-performing students along with our gifted students with the instructional experiences they need to grow. During my research on ways to improve instructional practices for high-performing students I identified several different content

strategies that have been used by teachers and identified through researchers that help high-performing students excel. Several of the strategies identified through research use devices in the classroom.

High-performing Learners and Technology

Beyond research on the general effects of devices in the classroom, I have examined the literature on the use of digital devices in the classroom with high-performing students, but I was able to find little on using devices to provide differentiation or enrichment in the regular, inclusive environment. Elementary students are usually mainstreamed in an inclusive environment with mixed ability groupings. If teachers understand the need for differentiated instruction for high-ability students, underachievement could be prevented. In a study of underachieving high school students, Reis and Renzulli (2003) showed how students believed that if they had been challenged in elementary school, they would have learned self-management skills that would have assisted them with the academic rigors in high school (Eddles-Hirsch, McCormick, Rogers, & Vialle, 2010, p. 103).

Classroom teachers are expected to serve all levels of students in an inclusive classroom environment. This applies to both a heterogeneous grouping where students from different academic ability levels are grouped together or homogeneous grouping in which students are grouped by the top performing group of students in that grade level. Both groupings can contain students with varying academic ability levels. Teachers are expected to teach to every child while making sure all of their individual learning needs are addressed so all students will grow. "Today, regular teachers are being taught to use

many different methods to ensure the success of a great range of students in what may be the most heterogeneous classrooms in the history of U.S. public education" (Bernal, 2003, p. 184). Due to so many ability levels being in one classroom, teachers sometimes struggle with how to manage providing instruction to each student on her/his level of learning. Mulrine (2007) states that teachers have to find creative ways to stimulate thinking and to create higher-order thinking opportunities for all students. Therefore, I wanted to complete this study to see if one-to-one devices could be identified as a creative way to create high order thinking opportunities for students.

"The educational technology community's collective knowledge about one-to-one initiatives has not to date kept up with the rapid expansion of these initiatives or with their breadth" (Kposowa & Valdez, 2013, p. 349). According to the Lei and Zhao (2008) study, there has been some research on digital initiatives and the implementation process, without sufficient data on how students use their laptops in the classroom. Additionally, there is little research on the intersection of high-performing students and the use of digital devices. This intersection is the subject of my study. I conducted a qualitative research study that gathers data from teacher interviews, classroom observations, and a focus group interview to identify how teachers are leveraging digital devices to differentiate and provide enrichment to high-performing students in the regular education classroom. Next, I define the purpose of my study and discuss the problem statement.

Purpose of the Study

The purpose of the study is to explore how general education teachers use digital technology to differentiate learning for high-performing students. Research on this topic

will help teachers of high-performing students find strategies they can implement that help high-performing students show growth on state performance measures. Research suggests that "traditional academic gifts are developed using curriculum compacting, acceleration, differentiated instruction and various forms of academic enrichment" (Renzulli & Reis, 2012, p. 21). I explored classrooms that have adopted a digital device initiative and that use devices to provide instructional activities to identify ways to improve instructional practices which make high-performing students more successful in attaining individual growth. The reason I felt this study was so important is due to the changing landscape of public education that includes: "Common Core State Standards, standards-based classrooms, high expectations and accountability for all students, multicultural diversity, recognition of different learning styles, and multiple intelligences, and rapid societal and technological changes" (Gregory & Chapman, 2002, p. 21). I was interested in identifying ways teachers use devices with high-performing students that make them successful.

Technology use is an inescapable reality of modern childhood with kids of every age spending an average of seven hours a day in front of electronic media, according to the US Department of Health and Human Services (HHS, 2016). Even young children are using devices: "According to a recent study, nearly 35 percent of children have their own mobile device at age two and have TVs in their rooms, and that number is 75 percent among four-year-olds" (Pandika, 2016, "Young children," para. 1). There has been much research on positive ways that technology is being used in the classroom to help students learn and grow by using a device. For example, Cavanaugh et al. (2011) found that laptop

computing had a positive impact across districts particularly in regard to changes in the teaching profession. They found through this study that teachers were changing their teaching practices and there was an increase in meaningful uses of technology in classrooms.

Lei and Zhao (2008) conducted a study to identify the impact technology had on student performance. They found that students who participated in a laptop program gained significantly in writing, English-language arts, mathematics, and overall Grade Point Averages. Additionally, they reported that technology that was used frequently increased student engagement and motivation (Lei & Zhao, 2008). The Lei and Zhao (2008) study identified several ways the laptop project helped teaching and learning. They also identified challenges: "The one-to-one laptops have provided great opportunities and resources for teaching and learning, but also raised issues such as student discipline problems, concerns on digital literacy, and fear of dependency on information technology" (Lei & Zhao, 2008, p. 118).

There is also much concern from researchers that the generation born with a device in hand could face developmental challenges, and these concerns translate to elementary classrooms. Experts raise questions about how devices are being used with students both at home and at school: "The American Academy of Pediatrics Studies suggest that screen time may be affecting the normal development of fundamental learning, language, and emotional skills" (Pandika, 2016, para. 1). Furthermore, "imaging studies have found that internet addiction and game addiction can shrink the brain regions responsible for planning and executive functions, empathy, compassion, and impulse

control" (Pandika, 2016, "Tweens and teens," para. 5). As such, while technology is ubiquitous in the lives of children, technology has neither been identified as inherently good nor bad for children. A Donovan, Green, and Hartley (2010) study on one-to-one computing in middle school found that increased access to laptop computers does not always equate to increased student engagement. A Cavanaugh, Giapponi, and Golden (2016) study regarding intensive use of digital devices suggests that certain "cognitive skills are gained through the use of devices but that other 'deep thinking' capabilities atrophy as a result of alterations in the neural circuitry of the millennial brain" (p. 374). There is research that identifies many concerns about how the use of so much technology on a daily basis is reprogramming the brain based on the external stimuli it receives from the speed and shifting focus that technology can provide.

Since research identifies both positive and negative results from the use of digital devices, it was important to identify what factors are essential to make the use of devices be successful. Through research I identified some factors that researchers have identified are key in digital devices being successful. Lei and Zhao (2008) identified several things that teachers should be trained on when using technology in the classroom: They should receive appropriate professional development, they should monitor students closely, and technology should be used as a tool along with other instructional practices to provide a balanced learning environment. The types of activities that teachers plan for students utilizing technology should be activities that provide enrichment. "It is therefore necessary for the laptop-infused environment to intersect with the professional development of teachers and systematic support" (Cavanaugh et al., 2011, p. 360).

Background Context

Often times there is a misconception in the public and with lawmakers that high-ability students do not need more extensive services or special programs because they are already performing on or above grade level. Even though society focuses on each school's performance and success on accountability measures, many people refuse to see the need for differences in the way that we provide educational services to students.

Accountability

Accountability continues to be a topic discussed heavily among educators. For many years, accountability in North Carolina has focused on proficiency, which means that students had to score a certain level on state standardized tests in order to be considered at grade level on end of grade tests. Most state testing is designed to target and measure grade level performance. This focus on proficiency has sometimes provided an incentive for teachers to marginalize students whose achievement is on the lowest and highest ends of the performance spectrum. Further, the National Council of Directors for teacher education programs reported that 65% of teachers did not feel equipped in their teacher preparation program to teach academically advanced students.

More intensive efforts to effectively serve high-performing students are necessary as is research that examines how high-performing students are served. Today proficiency is a large part of the accountability program for North Carolina and many other states, but some states are presently looking at the growth of each child as well in their accountability measures. Growth scores indicate how much students have grown in their performance over a year. The growth measure is different for each child depending on

how they performed the previous year. When compensation for principals and teachers is influenced by how much growth students make in a year, as is the case through the North Carolina 2016 and 2017 salary schedule revisions. On the North Carolina Public School Salary Schedules for 2017-2018, a principal's salary is determined on the number of students enrolled at the school s/he serves and the growth status from 2016-2017. There are three possibilities when looking at schoolwide growth in North Carolina: A school can show no growth, show expected growth, or exceed expected growth (NC Salary Schedule, 2017). Accountability has created high stakes for employees and schools where students are not performing on proficiency measures. Performance has been so important that a found in research that a consultant who was working in a turnaround school "explained to a group of teachers that they need not worry about the students who scored in the bottom quartile or about the students who scored in the top quartile, because the students in the middle had the power to improve the most" (Gentry, 2006, p. 73).

This type of accountability focuses all of the teacher's time and planning on the middle group (bubble kids), which leaves the lowest and the highest groups underserved in the regular classroom environment.

Bubble Kids

Prior to growth measures being included in the North Carolina Accountability Model, the main focus was placed on proficiency, which meant that a child scored a certain level on end of grade tests that gave them a proficiency status. The state used these students to configure a percentage of proficient students in each school. This way of reporting students' achievement did not focus on the individual growth of each child.

A child could maintain a proficient score each year without making any growth gains. During the time that the state used proficiency to report a school's success and student achievement, many schools focused on the students who were considered as being on the *bubble*.

> There is a widespread belief that the consequences of high stakes testing and accountability, particularly from accountability systems such as No Child Left Behind (NCLB), cause educators to focus on the so-called "bubble kids," which could harm the performance of lower and high achieving students. (Booher-Jennings, 2005, p. 233)

The bubble students are students who were projected as really close to passing with a proficient score. A proficient score represents grade level performance. Therefore, if students right at grade level are the focus, it leaves a lot of high-performing students to possibly flat line in their progress due to the lack of individualized instruction. This study specifically focuses on using digital devices to improve learning strategies and individualized instruction for high-performing learners to support their individual academic growth in the regular classroom environment.

Until society begins to see a need for all students to be taught in a way where every child grows, it is going to be a challenge for schools to provide a quality education for students.

> Every student benefits, from our highest achievers to struggling learners, when schools create an atmosphere that respects individuality and diversity and when opportunities, resources and encouragement are made available to maximize the strengths of all students. (Renzulli & Reis, 2012, p. 22)

Due to this need, educators must find ways outside the box to provide a differentiated

approach within an inclusive environment to maximize the strength of students.

For this study, I defined high performing as:

> A student with high ability as one who performs at, or shows the potential for
> performing at, an outstanding level of accomplishment in at least one domain
> when compared to other students of the same age, experience or environment; and
> is characterized by exceptional gifts, talents, motivation, or interests. (Schmitt &
> Goebel, 2015, p. 429)

The terms high-performing students are used in this study to define the students targeted.

The best way to define this group is by looking at their EOG score performance on

EVAAS. For the purpose of this study I focused on high-performing students, which is

often discussed along with gifted learners as if the terms refer to the same groups of

students. Many educators confuse these two groups. These students are performing on

achievement measures at grade level or above and may or may not be identified as gifted.

I chose not to just focus on gifted because the high-performing group focuses on a larger

group of students.

Giftedness

Gifted students is a term that is used in much of the research on rigor, high-

performing, and excellence, but can be very limiting in the students who are served due

to the limited ways that schools identify students for the gifted program. Many studies in

the area of giftedness are vague and inconsistent in finding a definition or way to identify

gifted. "Gifted education faces several obstacles, however, including several

misconceptions about giftedness and serving this unique population" (Schmitt & Goebel,

2015, p. 429). As such, giftedness is a problematic construct. Under-identification of traditionally marginalized students and a politicized construct have developed over time where the term gifted has been used to describe the white elitist group. However, the construct of gifted has changed throughout history to include a more diverse group of students. The ways in which students have been identified as gifted has changed many times and continues to be different in each district in North Carolina.

The most traditional ways used to identify gifted students are through IQ tests and standardized tests. "However, it is believed that these traditional means can overlook gifted students who may score lower on these types of assessments" (Schmitt & Goebel, 2015, p. 429). Many high-performing students may be overlooked in being identified by using such a limited approach in identification. "Another common concern is that traditionally underrepresented groups including minorities and those low socioeconomic state will be missed by traditional identification" (Schmitt & Goebel, 2015, p. 430).

In North Carolina, there are state mandates that require a special differentiated educational plan for gifted students. The North Carolina General Assembly statute provides the guidelines that districts follow:

> The General Assembly believes the public schools should challenge all students to aim for academic excellence and that academically or intellectually gifted students perform or show the potential to perform at substantially high levels of accomplishment when compared to others of their age, experience and environment. Academically or intellectually gifted students exhibit high performance capability in intellectual areas, specific academic fields, or in both intellectual areas and specific academic fields. Academically or intellectually gifted students require differentiated educational services beyond those ordinarily provided by the regular educational program. Outstanding abilities are present in students from all cultural groups, across all economic strata, and in all areas of human endeavor. (North Carolina. Gen. Stat. § 115C-150.5)

Gifted legislation and federal policy are very vague in requirements for serving

gifted children. Therefore, states and districts differ in the way they identify gifted

students, and in the way, they serve gifted students. "Giftedness depends to a great extent

on what a particular society, at a particular time, needs and values" (Franks & Dolan,

1982, p. 175). Franks and Dolan's (1982) work defines the gifted label as a social

construct that is highly politicized, while differentiation for all high-performing students

is a way to move beyond the under-identification of high-performing students, especially

from traditionally marginalized groups, as gifted. "Giftedness is not an objectively

observable condition but primarily a socially defined phenomenon" (Franks & Dolan,

1982, p. 175), and there is no monolithic theory of giftedness:

> The confusion about theories of giftedness has led many researchers to develop
> new models for explaining this complicated concept, but most agree that
> giftedness is developed over time and that the culture, abilities, environment,
> gender, opportunities, and chance contribute to the development of gifts and
> talents. (Renzulli & Reis, 2012, p. 21)

Renzulli and Reis argue that due to the complicated task of trying to identify

students who are gifted in an equitable manner, the theory that defines giftedness tends to

create new models throughout time. Due to the construct of giftedness shifting, many

students go un-identified who are high-performing students but are not able to be served

through gifted education due to the restraints on how students are identified. Renzulli and

Reis also believe that giftedness develops over time and that other environmental factors

may contribute to that development. "In many education circles, giftedness and talent are

defined in terms of the amount of additional resources students need" (Goodhew, 2009, p. 3).

The Gentry (2006) study discussed the challenges with *No Child Left Behind* and how it impacts high-performing students. "The one-size expectation fails to account for individual differences on variables linked to performance over which schools exert little control, such as socioeconomic status, environmental experiences, aptitude, school readiness and home environment" (Gentry, 2006, p. 78). Indeed, the very labeling of students as gifted is problematic:

> For the last two decades, we have advocated labeling of services students receive rather than labeling the students, for we believe that a shift should occur from an emphasis on the traditional concept of 'being gifted' (or not being gifted) to a concern about the development of gifted and creative behaviors in students who have high potential for benefiting from special educational opportunities, as well as the provision of some types of enrichment for all students. (Renzulli & Reis, 2012, p. 22)

Renzulli and Reis argue for a shift away from labeling students to emphasize providing differentiated support and services to students with strong potential. "To some extent the lines drawn between gifts and talents are artificial but as long as teachers, parents and students understand the terminology and students falling into both groups are given appropriate support and status, this is not important" (Goodhew, 2009, p. 6). If the lines are artificial then educators will be able to support both high-performing and gifted students in the regular classroom environment by utilizing the appropriate instructional strategies and resources that support rigor. One resource that has been introduced to many classrooms are digital devices.

High-performing students include those students who may not qualify for gifted services but perform well above their peers. High-performing students are very talented and it is very important that teachers and principals realize their potential so that morally they receive the appropriate learning environment that serves their needs effectively. High-performing students, due to their ability to excel academically, require instruction that engages and challenges them in a supportive environment: "Because potential talent needs to be nurtured and developed in young children, educators have a responsibility to be thoughtful and intentionally create optimal environments for talent development" (Herzog, 2017, p. 220). Due to their potential enrichment and more rigorous environments have been identified as important to their development. There are several strategies that have been identified through research that teachers are using to engaged high-performing students. In the Miller and Gentry (2010) study, teachers indicated that providing students with choice, finding what the students' interests were and using advanced content that allowed hands-on activities improved student motivation to learn. If students are not engaged, they may not grow academically, even though they have the potential:

> There might be long periods of inactivity but when real engagement takes place, gifted performance is possible—hence the importance of appropriate provision, a large talent pool in which to look for potential giftedness and exciting teachers who inspire students to become engaged in this way. (Goodhew, 2009, p. 2)

Engagement is important for students to grow which is why I wanted to take a closer look at how teachers are engaging students by using devices.

Research Questions

The question I am interested in for this study is, "How do elementary teachers who successfully promote growth in high-performing learners use digital devices to improve learning for these students?"

My secondary research questions are:

- What strategies that utilize digital devices do elementary teachers use to improve learning of academic content knowledge for high-performing students?

- How do elementary teachers enrich curriculum and instruction for high-performing students by using digital devices?

- How do elementary teachers improve high-performing students' learning of higher-order thinking skills?

- How do elementary teachers improve high-performing students' learning of critical thinking skills?

- How do elementary teachers improve high-performing students' learning of creative skills?

I wanted to help other teachers learn through my research by providing them with examples of best practices used by teachers in my study who have been using digital technology in their classrooms. I wanted other teachers to see how technology can be used in the classroom to give them a platform for building complex, higher-order thinking assignments and projects that help their high-performing students grow through the enrichment activities that are provided to them. I wanted educators to learn new

instructional strategies from this research that they can use in a digital environment. It is

vital that we as educators use technological resources to help maximize our instructional

time and allow it to become a resource for both us and our students in the daily classroom

environment. "Information technology can also be used to design virtual learning

environment that allows for enriched learning experiences and more advanced study for

these high-ability learners" (Mulrine, 2007, p. 38). What better way than to learn from

others who are maximizing technology as a resource for their students?

Conceptual Framework

This conceptual framework represents critical components for both technology

and differentiated learning. The Renzulli (2010) model (see Figure 1) involves a triad that

uses three types of instruction to provide enrichment to students in the regular general

classroom setting—group, individual, and small group. In order to effectively identify

differentiation and enrichment with high-performing students it is important to look at the

Enrichment Triad Model, developed by Renzulli, which is comprised of three phases in

the regular classroom environment: exposure/exploration on the topic, whole group skill

and process development, and small group investigations of the real problem or task

which is achieved through investigation and creating a product by application of

understanding content.
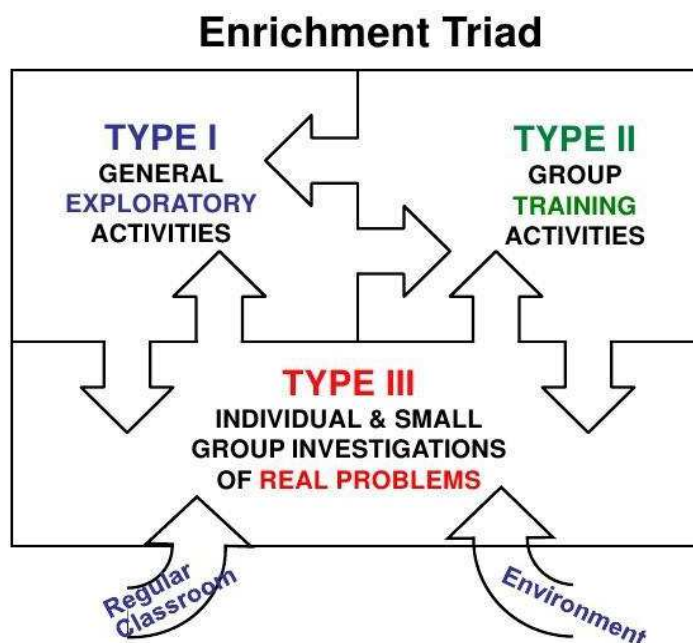
Figure 1. Renzulli's Enrichment Triad Model. Source: Renzulli, J. S., & Renzulli, S. R. (2010). The Schoolwide Enrichment Model: A focus on student strengths and interests. *Gifted Educational International, 26*(2-3), 140–157. doi:10.1177/026142941002600303

Phase I in the model provides a general exploratory activity for students to understand a new concept. Phase II is a group activity that trains students on how to complete the enrichment activity. Phase III is assigned to individual students or small groups to investigate real problems using their understanding of the topic and training they received in Phase II. This model allows teachers to provide content to students based on their developmental level. It also allows students to apply content and develop a deeper understanding of content. This allows students to continue their growth on each topic by allowing them to create and apply knowledge to real problems. Students who are able to do this exhibit mastery.

In order for high-performing students to grow, it is important for them to develop critical thinking skills and delve deeper into content identified in the literature by using technology to complete more challenging assignments. "This technology is also believed to provide the added benefit of better knowledge acquisition, improved critical thinking and greater engagement with the material" (Nicol, Owens, Le Coze, MacIntyre, & Eastwood, 2017, p. 1). Through this study, I will inquire how teachers are leveraging the devices in their classrooms to allow students to explore content, use digital resources to develop a deeper understanding of the topics, and allow students to use different resources to work independently or in small group to apply, analyze, evaluate, and create the content they are learning in their grade level instruction. I will observe, and discuss different projects and tasks that fall into one of Renzulli's three phases. My hope is that with high-performing students, most activities will fall into Phase III in order to develop a student's full potential in receiving the most rigorous assignments, in terms of the higher levels of cognition.

Definition of Terms

There are several important terms that I defined for this study. Technology has become such a widespread topic of interest in education that sometimes it is hard to define when someone is using terms like technology, 21st century, or the use of devices in the classroom. These terms can take on many different meanings, and it is important to identify through research how classrooms are using technology with students.

- Technology—"The term technology is used in reference to desktop computers, laptops, tablets, and any handheld devices that run software applications" (Musti-Rao, 2017, p. 132).

- Digital Program— "A basic definition of a school digital program is one that provides a computing device for each student" (Sauers & McLeod, 2017, p. 1).

- Social media—"any technology that facilitates the dissemination and sharing of information over the Internet" (Stewart, 2016, p. 482).

- High-performing student—

A student with high ability as one who performs at, or shows the potential for performing at, and outstanding level of accomplishment in at least one domain when compared to other students of the same age, experience or environment; and is characterized by exceptional gifts, talents, motivation, or interests. (Schmitt & Goebel, 2015, p. 429)

Summary and Overview

In Chapter I, I described the research topic, background context, and research questions that guided this study. Because we are living in the age of accountability, it is important that school administrators and teachers find innovative ways to provide services to all levels of ability in the general education classroom. One of those strategies is the use of digital devices. Our society is thriving on the use of technology as a lifeline, so we must take advantage of this powerful tool to help differentiate instruction and individualize learning to help students to academically excel.

In Chapter II, I share five main areas I found in my literature review that are relevant to this study. I have researched studies on technology in the classroom, content strategies, enrichment, differentiation, and teacher professional development. I provide information relevant to the research regarding components of differentiation and the use of devices in a regular education classroom.

In Chapter III, I describe my methodology for an empirical research study where I talked with teachers about the practices used in their classroom. I provide details about my research design, approach, participant information, data analysis, and trustworthiness of my findings. In Chapter IV, I present the data collected through my observations and interviews with teachers. In Chapter V, I summarize the findings and provide my interpretations of the data and its relevance and possible implications for teachers and leaders to increase the enrichment opportunities for high-performing students in schools by better leveraging devices.

CHAPTER II

REVIEW OF THE LITERATURE

In this study there are several important concepts that need to be explored when looking at how teachers are leveraging technology with high-performing students in the elementary classroom. Most higher performing learners are well above their grade level, and much of what is taught to them in whole class instruction is on grade level content, which can be repetitive. With high-performing learners, it is important for teachers to make the content more rigorous and in-depth with students so they are being challenged. "These students and many others have the capacity and right to move well beyond proficiency, yet they may require special services and consideration for this to happen" (Gentry, 2006, p. 77).

Academic rigor is important to provide for these higher performing students by differentiating concepts based on their ability and not their grade.

> In these rigorous learning environments, students accept greater responsibility for developing and applying a deep understanding of significant concepts, generalizations, essential questions, and skills and procedures to problem finding and problem solving for which there are no predetermined limits. (Matusevich, O'Connor, & Hargett, 2009, p. 47)

Due to the need to differentiate in order to provide rigor, it is imperative that districts have a plan in place to serve high-performing students effectively.

Students are surrounded by the use of devices for a large portion of their daily lives. It remains crucial in developing future leaders and productive citizens for schools to engage students and provide strategies for student growth through the use of devices. There are many ways that districts have utilized for the implementation of devices. Multiple studies that I have explored have highlighted positive integrations using technology and there is also research that identifies negative integrations in the use of digital devices in the classroom. There is much research that provides data on specific programs using devices but little research has been conducted on how devices have been used to provide differentiation. I felt that due to the lack of research that this would be enlightening to administrators and districts on looking at how teachers are leveraging digital devices in elementary to provide enrichment for their high-performing student subgroup. Five important topics are important to this research: technology in the classroom, content strategies when teaching high-performing students, enrichment, differentiation, and teacher professional development.

Technology in the Classroom

Technology has been slowly making its way into many schools and classrooms as a personal tool for students to use on a daily basis. "The term technology is used in reference to desktop computers, laptops, tablets, and any handheld devices that run software applications" (Musti-Rao, 2017, p. 132). Many schools have now been able to seek funding to provide a device for each child. Lowther, Ross, and Morrison's (2003) study observed that there were over a thousand schools using some type of laptop program in the United States. Teachers' use of technology has changed drastically from

being used as a tool for the teacher to being placed in the hands of students to use as a daily tool, and technology can help to extend and enrich the learning of high-performing students.

Traditionally technology enables educators to provide advanced students with (a) access to more advanced content, (b) contexts for developing and applying critical and creative thinking skills, and (c) tools for constructing and sharing sophisticated products while supporting the exploration of abstract concepts and their interdisciplinary applications (Siegle, 2013). Technology has opened an endless way for educators to provide advanced material to high-performing students and create a rich environment.

> In these rich learning environments, students share their strengths and collaborate with others to extend and challenge their thinking. Creativity is greatly enhanced because students have opportunities to engage with multimedia materials and technology to represent their ideas. (Hertzog, 2017, p. 220)

The amount of resources and opportunities that can be made available to students through the use of devices is growing daily. Students are able to research advanced topics and uncover new material to help them think creatively and problem-solve.

There are endless opportunities to collaborate and work with other professionals all over the world to uncover new ideas and strategies that engage student learning. "Teaching and learning are now expanding because of vertical and horizontal interactions in real pedagogical situations in a digital environment: children to adults, adults to children, and children to children" (Battro, 2013, p. 134). High-performing students have the opportunity to work with students from all over the world on solving complex problems through the use of technology. "Highly capable students are students who

perform or show potential for performing at significantly advanced academic levels when compared with others of their age, experiences, or environments" (Hertzog, 2017, p. 219). These students are very capable of achieving high academic standards and should be developing their potential in the regular classroom environment through appropriate instruction or assignments that provide enrichment for them to grow. Consequently, we have seen a shift in paradigm from teacher use to student use of technology. Technology has become important to teachers in helping provide leveled instruction to students in the classroom.

Russell, Bebell, and Higgins (2004) found that in classrooms where students were using digital devices, teachers were able to individualize instruction with full access to technology, which helps teachers to better provide differentiation for students' individual learning needs. This is due to using devices with the group, it allows individual students to work different activities. This paradigm shift requires teachers to use technology to help serve all of the different learners in their classroom—including their highest performing learners who sometimes do not receive the rigor they need to stay motivated and engaged. "Current beliefs and assumptions regarding curriculum for high-ability students emphasize that all learners should be provided with educational opportunities that allow them to reach their optimum learning potential" (Hebert & Neumeister, 2000, pp. 122–123). If students are given educational opportunities that nurture their development and teach them where they are developmentally then they will grow. "Because potential talent needs to be nurtured and developed in young children, educators have a responsibility to be thoughtful and intentionally create optimal

environments for talent development" (Herzog, 2017, p. 220). Many educators have tried different strategies to provide this environment for high-performing students.

One of the most current strategies is the use of digital devices to help provide instruction or activities to high-performing students in the regular inclusive environment. "Teachers are encouraged to design activities that are challenging but reasonable in terms of their students' capabilities and that focus on individual improvement, learning, progress, and mastery" (Hebert & Neumeister, 2000, p. 123). The activities that students are assigned should focus on their individual needs in order to nurture their academic ability. When students are able to have a device, they are able to work more independently on tasks that are developmentally appropriate. "Students who have one-to one computer spontaneously work in collaboration and teach each other in many different settings at school, at home and in public places" (Battro, 2013, p. 133).

Teachers can provide differentiated activities through the use of digital devices for high-performing students. "Differentiation for students usually involves modifications in content, process, product, and the learning environment" (Siegle, 2013, p. 51). Differentiation allows multiple opportunities for students to take advanced level courses or complete assignments that help them grow instead of being forced to repeat grade level content they have already mastered. "The infusion of technology for learners should be appropriately challenging and enhance curriculum beyond what is provided for learners in general education" (Shaunessy, 2007, p. 120). Technology can help teachers leverage assignments and differentiation better due to all of the resources that it offers. There are multiple online programs with varying levels and platforms for teachers to use leveled

assignments, such as Canvas, Google Classroom, Math and Literacy Programs, Tech Books, and many other learning resources.

Technology in Elementary Education

Technology in elementary education is increasing but has been slower to develop research. "Research suggests that the use of technology in the elementary classroom has positive impacts on student learning and motivation and is therefore important for 21st century teaching and learning" (Coleman, Gibson, Cotton, Howell-Moroney, & Stringer, 2016, p. 276). There is little research that I have been able to find on how digital devices are being used in the elementary classroom. Most of the research is on specific programs or secondary level programs. Therefore, I tried to find research on educational technology that could be applied at the elementary level. "Education technology has the mission to design, manage, implement, and evaluate technological resources and processes to facilitate learning" (Sezer, 2017, p. 473).

There has been much research conducted on how students are being asked to use technology in the classroom and on teaching strategies that incorporate different components of technology. "The Pew Research Center reported that 92% of US teenagers go online daily, and 71% use at least two social networking sites" (Stewart, 2016, p. 481). Technology has become a part of all students' daily lives, which requires us to change the way that curricular activities are assigned and organized for students. "The contemporary classroom is open (as opposed to closed), global (as opposed to local), and connected (as opposed to isolated)" (Aagaard, 2017, p. 1128). Technology has increased in everyday life and therefore has become a large part of how education continues to reform.

The ways that people interact, communicate, and learn will continue to change, which will also change the way that students learn. "When viewed from this perspective, it is an accepted fact that there is a need for a more modern and effective learning-teaching method that assigns responsibility to the student, that encourages individual learning, that makes the teacher more of a guide than a leader" (Sezer, 2017, p. 473). Due to this shift, it is important that teachers use strategies to which students can relate in order to guide them in learning.

There are many social media platforms that can be leveraged in the classroom to help students interact with writing, reflections, creating, and collaboration assignments. Some of the platforms that students use most are interactive sites, online software programs, blogs, or social feeds that require responses. Stewart's (2016) study found many benefits of using social media for students such as backchannel discussions, enhanced communication, increased student creativity, classroom management, increased access for academically marginalized students. Due to technology being a positive way to engage students and differentiate their personalized learning, it is important for these high-performing students to have access to a device on a daily basis. "Education technology can be defined as a process that is used to enrich all stages of education and make the work of those involved in education easier" (Sezer, 2017, p. 472). Technology is a great resource that can provide enrichment for high-performing students in the classroom. Teachers in the Russell et al. (2004) study reported that they were more able to individualize instruction with full access to technology.

One-to-One in the Classroom

The implementation of digital devices can look very different from one school to another. There are many different models and different types of devices that can be purchased by districts for teacher and students to use in the classroom. The use of one-to-one devices in the classroom is a concept that has really evolved in the last decade from the use of digital devices. EdTech has released a recent report that more than 50% of teachers now have one-to-one in their classrooms which is a 10% increase from a year ago. "A basic definition of a school one-to-one program is one that provides a computing device for each student" (Sauers & McLeod, 2017, p. 1). "An emerging and common feature of most computer initiatives, at both state and local levels, is that students have individual access to both hardware and software at all times" (Kposowa & Valdez, 2013, p. 349). One-to-one access allows teachers to use the devices as a teaching resource, but it requires significant investment. "In recent years, 1:1 student computing initiative have received a great deal of attention and may represent schools' largest potential financial investment in the area of technology" (Sauers & McLeod, 2017, p. 2). The Laptops for Learning task force in 2004 found evidence of heterogeneous patterns of implementation in one-to-one initiatives that had been strongly endorsed by parents, teachers, and students. There are other studies such as the Grimes and Warschauer (2008) study that dropped the one-to-one initiative "due to high cost and high breakage rates and lack of demonstrated results, particularly in regard to standardized test scores" (p. 305). Lei and Zhao (2008) state that one-to-one computing is one of the fastest growing, yet most controversial phenomena in America. "In the past decade, there has been an increasing

use of laptops in U.S. elementary, middle, and high schools" (Kposowa & Valdez, 2013, p. 346). The mixed reactions arise from limited empirical data on the effectiveness of one-to-one on student learning.

Lei and Zhao (2008) researched what advantages and challenges are brought to schools by using one-to-one by administering surveys to 231 students, 28 teachers, and 44 parents from schools that had one-to-one. Exploring the implementation process and success of the implementation, the researchers found that one-to-one has positively impacted student outcomes. In the Lei et al. (2008) study the data identified that "most students (81.4%) used their laptops for homework, followed by searching information for school work (71.4%), emailing (65.8%), surfing online for entertainment (58%), chatting online (51.1%), and working with specific software (50.2%)" (p. 106). In this study it identified multiple ways that students are using their devices inside and outside the classroom.

> One-to-one laptop programs arguably offer the greatest potential of educational technologies to date in that they place the most power and versatility in students' hands, while wireless network connections open vast new vistas for communication and collaboration. (Grimes & Warschauer, 2008, p. 305)

One-to-one laptops offer teachers a versatile resource to use in helping students learn and excel in the classroom.

> In recent years attention has focused on the use of computers as a means of helping American students achieve higher educational achievement, to compete with their counterparts around the world, and to eventually enter a work force with skills needed to succeed in a globalized economy. (Kposowa & Valdez, 2013, p. 349)

In the laptop computing study "over 60% of the teachers reported increases in conditions that support learning: enjoyment, motivation, engagement, on-task behavior, and positive school experience" (Cavanaugh et al., 2011, p. 370).

Additionally, Lei and Zhao (2008) identified the need for additional research on how devices are used to promote student learning:

> When it comes to the question of what really happens when every child has a laptop and how the laptops are being used in the classrooms, current studies provide only general information on "what" is used, "how much" is used, and the changes in "what" and "how much" but not much information on "how" the laptops are being used in teaching and learning practices. (Lei & Zhao, 2008, p. 98)

What really happens in the classroom when leveraging devices is important to study because it explores how the laptops are being used in the teaching and learning process. This data would be extremely important in identifying the true effects of one-to-one devices. In the Lei and Zhao (2008) study, "the impact of technology use on student outcomes is not determined merely on by the technology uses, but it is mediated by the environmental factors, the users, and the technology" (p. 114). The impact of technology depends largely on how the teachers are changing their teaching strategies, assignments they are assigning students through the use of devices, and the type of learning environment in the classroom.

Many teachers are now using these devices to help teach all levels of students based on their cognitive ability. "One-to-one laptop programs are one way many schools and districts are attempting to bridge the gap between student needs and classroom environments" (Donovan et al., 2010, p. 424). Technology will continue to evolve in

different ways that it is used in the classroom. "Results indicate that teachers in schools with one-to-one student computing initiatives report higher levels of personal technology competency and classroom integration of learning technologies" (Sauers & McLeod, 2017, p. 1). The impact that technology has made on students, teaching, and learning continues to be researched. In the Harper and Milman (2016) study, "researchers reported seemingly conflicting findings regarding the impact of technology on student achievement, most noted that 1:1 technology provided students with at least some achievement-related benefit" (p. 131). There are many factors that have been identified in the previous research listed above to one-to-one implementation into schools. Several of the factors involve teachers and how much training they have been provided before and after implementation.

Leveraging One-to-One Environments to Support High-performing Students

One-to-One environments have grown tremendously in education. "Over the past decade, the number of one-to-one laptop programs in schools has steadily increased" (Zheng, Warschauer, Lin, & Chang, 2016, p. 1052). Districts have looked at finding ways to fund technology so that each child has her/his own device. "One-to-one laptop programs have spread widely since they were first introduced in Australia and the United States in the 1990s" (Johnstone, 2003, p. 243). There are many factors that contribute to the device implementations. Even through one-to-one is not a new concept "there was still also no evidence that student performance or satisfaction of school had increased" (Sutton, 2015, para. 4). The lack of research on how effective one-to-one devices are in improving student success and providing better instruction in the classroom it is hard to

really see. "Specific factors, such as teachers' attitudes and beliefs, school leadership, classroom management strategies, technical support, and ongoing professional development, played a vital role in ensuring the success of the laptop implementation program" (Zheng et al., 2016, p. 1054). Aagard's (2017) study explores how technology adds to the contemporary classroom. "This new technology-enhanced learning environment provides opportunities for educators to design learning that empowers students to reach beyond local resources and people to engage in learning with and from others from anywhere and anytime in the world" (Lock, 2015, p. 140).

The way that teachers leverage one-to-one devices depends on how much they support high-performing students by way of technology. "When integrated meaningfully with curriculum and instruction, technology can be beneficial to teachers" (Musti-Rao, 2017, p. 132). Some of the studies that I have found try to identify how technology has been leveraged in the classroom to help teachers improve their instructional practices without decreasing student performance.

> The most common changes noted in the reviewed studies include significantly increased academic achievement in science, writing, math, and English; increased technology use for varied learning purposes; more student-centered, individualized, and project-based instruction; enhanced engagement and enthusiasm among students; and improved teacher-student and homeschool relationships. (Zheng et al., 2016, p. 1075)

There is little research in looking at how the devices are being used in a way that brings increased student performance.

Content Strategies

During my research I wanted to explore different strategies that teachers were using with their high-performing students. High-performing students are sometimes a challenge in the classroom due to their creativity and natural curiosity. "Both creative thinking and critical thinking are complementary" (Young, 1992, p. 48). High-performing students can be defined for this study as performing high on classwork and testing that is meeting grade level standards or higher. High-performing students can be very creative in their learning. "Creativity is a multidimensional topic characterized by fluency (producing many ideas), flexibility (producing unusual ideas), originality (producing unique ideas), and elaboration (adding detail to the ideas)" (Young, 1992, p. 49). In the Mulrine (2007) study he states that teachers have to find creative ways to stimulate thinking and to create higher-order thinking opportunities for all students.

Higher-order thinking skills are utilized through the type of activities and assignments that students are given in class that promote the general use of certain skills. "Opinions differ as to what those skills are; however, most do agree that problem-solving abilities or cognitive enhancement can be taught, and that higher-order thinking skills can be affected by instruction" (Young, 1992, p. 48). Most researchers believe that thinking skills instruction should be fused in the content areas. "Critical Thinking programs are important in a society in transition" (Young, 1992, p. 47).

> In these rigorous learning environments, students accept greater responsibility for developing and applying a deep understanding of significant concepts, generalizations, essential questions, and skills and procedures to problem finding and problem solving for which there are no predetermined limits. (Matusevich et al., 2009, p. 47)

There are many models of higher-order thinking such as Bloom's Taxonomy, developed in 1956 which is an interactive hierarchal entity that flow naturally as the entities are attained. Glade and Rossa Matthews in 1989 divided their thinking skills into 6 areas of thinking. Marzano divides his thinking skills into 21 different components. "Critical thinking refers to students constructing arguments, applying logic to reasoning, providing evidence to support their inferences" (Young, 1992, p. 49). The models that support high ordered thinking skills help high-performing students make individual growth and are found to be successful in the classroom.

In order to provide critical thinking environments and assign high ordered assignments teachers must understand strategies they can utilize to teach the content on a higher level. There are a few strategies I have identified in research that are being used in the elementary classroom to help students be successful. The strategies are the flipped instructional approach, mentoring, and gaming.

Flipped Instruction

There are several methods that can be used in the classroom to help provide high-performing students the rigor that they need. "Technology-related changes have led to the emergence of new approaches to teaching and learning and have raised the question of the use of a new teaching strategy: the flipped classroom" (Sezer, 2017, p. 474). One way to provide differentiation through the use of technology is to use the flipped classroom approach to learning. "In contrast to the usual practice, students learn the content of the course material under their own supervision and then discuss and practice what they have learned under the supervision of a teacher in class" (Sezer, 2017, p. 474). Siegle (2013)

states the goal of a flipped classroom is to take the attention off of the teacher and place it on the students. This strategy places students in control by allowing them to move through material at their own pace. This allows students the option to work on projects of common interests and gives teachers time to interact with those students on a higher level. "[In] the flipped classroom, teachers can provide gifted and talented students with advanced content beyond their grade level" (Siegel, 2013, p. 51).

The flipped classroom also allows opportunities to group students during the school day to collaborate on projects and more challenging work. When students are able to collaborate, they receive valuable insight and feedback from their peers. In the flipped classroom approach, it also allows teachers to provide feedback through group discussion. Siegle (2013) identified in a review of instructional practices that the single strongest effect on student achievement is the individual feedback students are given in the classroom. "In a student-centered learning environment, teachers attempt to address the interests and strengths or weaknesses of students based upon their previous experiences and prior knowledge" (Sezer, 2017, p. 474). The feedback that teachers are able to give students helps students identify their strengths and weaknesses so they exhibit more growth. The Boling and Beatty (2010) study "illustrates how both the quantity and quality of computer-mediated feedback increased over time, resulting in students learning not only from their teacher but from each other" (p. 47). This study found that students were not receiving beneficial feedback that was beneficial to them in impacting their achievement. When feedback is occurring in the classroom it is about self

as a person referenced on a behavior or right or wrong. Online feedback was less teacher-centered and focused more on students being able to engage in instruction.

In using a flipped classroom approach by leveraging technology, Siegle (2013) finds that students are able to access more advanced content online, develop contexts for application and critical thinking skills, access tools for constructing and collaborating with others using their skills, while supporting the exploration of abstract concepts in their application of classroom content. The flipped classroom requires teachers to change the way they provide classroom instruction and assignments. The flipped classroom is a great instructional technological strategy that provides differentiation for varied levels of students and allows students to complete assignments independently. "Active learning requires moving away from teacher-centered instruction where the teacher controls what gets taught, when it gets taught and the pace by which it gets taught to a student-centered approach" (Nicol et al., 2017, p. 2). The flipped classroom approach allows higher performing students to become active learners in a regular inclusive classroom. "Active learning, one form of student engagement, is an active, collaborative, cooperative and problem-based teaching method that gets students involved in their own learning by participating in relevant activities and thinking about the outcomes of those activities" (Zepke, 2013, p. 100).

Mentoring Online

Mentoring students online has been a common practice used in secondary but it is not a typical practice in the elementary classroom. "The few methodologically acceptable studies of online mentoring in STEM with talented girls that have been published indicate

that such programs are effective" (Stoeger, Hopp, & Ziegler, 2017, p. 240). Online

mentoring can be very effective due to the valuable feedback that is being provided to

students. "The mentees in one online mentoring program (Cyber Mentor) showed both

short-term and long-term, improvements in their knowledge about university students and

jobs in STEM as well as in their certainty about academic and career goals in STEM"

(Stoeger et al., 2017, p. 240). Online mentoring can be a valuable way to provide high-

performing students feedback on more individualized assignments they have received

online.

Gaming

Many strategies that teachers use in the classroom to engage students in

instruction involve some type of gamification. Gamification refers to the application of

"game-based mechanics, aesthetics, and game thinking to engage people, motivate action,

promote learning, and solve problems" (Kapp, 2012, p. 10). Gaming is a great strategy to

use with devices. Students respond to content more when they enjoy the strategy used to

provide the content. "Collaborative hands-on projects are recognized as excellent

stimulators of student interactions and active learning" (Barneva, Kanev, Kapralos,

Jenkin, & Brimkov, 2017, p. 310). Hands-on learning approaches motivate student to

become actively involved in learning. Today's student is so used to constant stimulation

in programs like gaming that this captures their attention. Video gaming is widespread

among students—both boys and girls. Many students who participate in gaming now play

with people from all over the world through playing on the web. "Games provide players

with immediate, concrete feedback that documents their growth as a result of the effort

they have made" (Siegle, 2015, p. 192). Gaming can keep students engaged and can be used to assess student progress. Many of the online software programs include types of gaming to engage students in working on skill sets. "Specifically, some Web sites provide opportunities for children to play various games with isolated reading skills" (Baker, 2007, p. 5). Some of the games according to this study allow skill proficiencies to be assessed and then it matches those skills with practice items that work on the abilities they need.

During my research there were several specific strategies identified that teachers use in the classroom but I was interested in how the devices were being used to provide differentiation and enrichment to students on a daily basis. I found little research on this topic.

Enrichment

Technology can be a resource to help provide enrichment for those high-performing students who need deeper instruction on grade level content. Through research it has been noted that when students are in a digital environment they receive for individualized instruction. "This data suggests that learning activities were most often structured in an individual format in the 1:1 classroom and most often structures in a large group format in the shared laptop classrooms" (Russell et al., 2004, p. 324). Learning activities that are structured to focus on individual development offers students enrichment opportunities. Reis and Purcell (1993) report a "mismatch between 24-70% of the curriculum across content areas for more capable students" (p. 147). Enrichment will help high-performing students receive the rigor they need above grade level curriculum.

The Reis and Purcell study found the work students are given often lacks challenge, and shows little differentiation to meet students' advanced needs in the classroom. Enrichment is one way that teachers can provide differentiation for high-performing students.

Enrichment can be explained by looking at the Enrichment Triad Model created by Renzulli in 1977, which is a model that encourages creative productivity in students by exposing them to various topics, areas of interest, and fields of study (Renzulli & Renzulli, 2010). "In this model students are trained to apply advanced content, process-training skills, and methodology to self-selected areas of interest using three types of enrichment" (Renzulli & Renzulli, 2010, p. 144). In the Enrichment Triad Model:

> Type I enrichment exposes students to a wide variety of disciplines, topics, occupations, hobbies, persons, places, and events that would not ordinarily be covered in the regular curriculum. (Used to stimulate new interests or expose students to new opportunities)
>
> Type II enrichment includes materials and methods designed to promote the development of thinking and feeling processes. (This is the development of creative thinking, problem solving, critical thinking, how-to skills and great communication skills)
>
> Type III enrichment involves students who become interested in pursuing a self-selected are and are willing to commit the time necessary for advanced content and acquisition and process training where they assume the role of first-hand inquirer. (Application Knowledge, Creation, Acquire, Process, and Commit to task). (Renzulli & Renzulli, 2010, pp. 144–145)

This model has been used by many researchers as a framework to identify other models or programs that use enrichment. The pedagogy of this enrichment system created by

Renzulli was further developed into a Schoolwide Enrichment Model (SEM) which

addresses enrichment:

1. Strength-based student portfolio that contains information about academic achievement, preferred areas of interest, learning styles, and preferred modes of expression.
2. Curriculum compacting, a systematic procedure for modifying and differentiating the curriculum for high-achieving students.
3. Enrichment learning and teaching, with three types of enrichment opportunities based on the Enrichment Triad Model. (Renzulli & Reis, 2012, p. 20)

The SEM model integrates opportunities for students to increase both academic strengths

and their creative productiveness in the regular classroom, which goes beyond using

standardized tests alone to identify giftedness. "History tells us that it has been creative

and productive people of the world, the producers rather than the consumers of

knowledge, who have been recognized in history as 'truly gifted' individuals" (Renzulli

& Reis, 2012, p. 21). The new goal for schools should be to create a total enrichment

program that focuses on making schools places that develop the talents and abilities of all

students in an inclusive environment through the differentiation and enrichment provided

to them by leveraging digital devices. "For a modern state to survive and advance

economically, it needs a highly educated workforce that is capable of adapting to

advances in technology to meet job demands of the 21st century and beyond" (Kposowa

& Valdez, 2013, p. 346). This reason alone should motivate us all as educators to be sure

we are providing enrichment and instruction that helps our high-performing students

grow by providing the differentiation they need.

Differentiation

The change in teachers' instructional practices when devices are implemented

continues to be identified through research. "Examples of changes to the classroom

environment included deeper learning experiences for students, new instructional

approaches by teachers, or changes in students' and teachers' interactions" (Harper &

Milman, 2016, p. 134). Differentiation is part of Renzulli's Schoolwide Enrichment

Model. Tomlinson and Jarvis (2009) define differentiation this way:

> Differentiation is an approach to curriculum and instruction that systematically
> takes student differences into account in designing opportunities for each student
> to engage with information and ideas and to develop essential skills.
> Differentiation provides a framework for responding to differences in students'
> current and developing levels of readiness, their learning profiles, and their
> interests, to optimize the match between student and learning opportunities. These
> three dimensions of student difference can be addressed through adjustments to
> the content, process, products, and environments of student-learning, and each is
> justified by a research-based rationale. (p. 599)

Technology provides teachers a way to differentiate learning for students in their

classroom by allowing students to create content by using different tools, such as social

media and digital resources, to allow high-performing students to be challenged in order

to meet their unique learning needs in the regular classroom environment. "Studies of

several different devices provide evidence that digital technology integration increases

the frequency and meaningfulness of differentiation during classroom, instruction"

(Harper & Milman, 2016, p. 134). Differentiation is important to classrooms that contain

multiple ability groups in an inclusive environment. High-ability students need rigor in

order to grow and develop their abilities. In the Kim, Cross, and Cross (2017) study on program development for high-ability students,

> according to their suggestions, curriculum for high-ability students should be research based, providing scaffolding through questioning and thinking models, acceleration with support, and opportunities for real-world projects and problem solving. (p. 93)

A great teacher will differentiate instruction for students of various performance levels in the classroom. "Differentiating instruction makes sense because it offers different paths to understanding content, process, and products, considering what is appropriate given a child's profile of strengths, interests, and styles" (Dixon, Yssel, McConnell, & Hardin, 2014, p. 111). Carol Tomlinson's work in 1999 through present research looks at different aspects of teaching that change the way instruction is provided to students. Tomlinson (1999) felt that teachers need to use small group teaching versus whole group teaching. The Storz and Hoffman (2013) study "found teachers' instructional approaches when working different in 1:1 classroom; teachers conducted more individual and smaller group work, and students communicated more with their teachers" (as cited in Harper & Milman, 2016, p. 134). Tomlinson (1999) also believes that teachers have to provide multiple texts and sources of information instead of just one text or source so that students with different learning styles and skills may have access to the information (Tomlinson, 1999). Most teachers serve students of varied performance levels in their elementary classrooms. One size does not fit all when providing instruction for students of various performance levels in the regular classroom.

> Meeting the needs of their students with different levels of mastery . . . can be a daunting task: It required modifying textbook content, designing lessons customized to students' presenting skills, and using alternative resources emphasizing the same concepts and skills to provide additional practice and reinforcement (McCoach, Gubbins, Foreman, Rubenstein, & Rambo-Hernandez, 2014, p. 272).

According to VanTassel-Baska (2017), differentiation can be implemented if teachers utilize ongoing assessment, grouping, materials, curriculum targeting, instructional issues, contact time, and learning assessments in the regular classroom setting. Ongoing formative assessment is essential in order to assure students are gaining needed competencies and progressing at a rate commensurate with their individual needs. "In Tomlinson's definition of differentiation, teachers have to be responsive to students' varied readiness levels, interests, and learning styles" (Hertzog, 2017, p. 227). It is important for teachers to remember that not all high-performing students need advanced instruction in all areas of learning, which makes identifying their strengths and weaknesses even more important when trying to differentiate to help them grow. "Programs and curricula should try to provide the optimal match to a student's interests and aptitudes, unleashing greater motivation and desire for learning as a result" (VanTassel-Baska, 2017, p. 62). By providing this type of educational environment, students will be more successful in developing higher skills and will show growth. "The differentiation needs to be woven into the fabric of the classroom, not just one assignment. In a differentiated classroom, there is a pervasive expectation of growth" (Hertzog, 2017, p. 227).

Technology allows teachers to be able to meet with all groups individually and provide more directed instruction to the students based on their level of ability using the devices they have in their classrooms. "In a differentiated classroom, teachers may use a variety of strategies to meet these goals, including adopting one or more curricular elements, such as content, process, and product, in response to student readiness, interest, and learning profile" (Tomlinson, 1999, p. 1). While teachers are meeting with groups to help with direct instruction, other students are able to use devices with educational programs or preloaded instructional material which can eliminate any wasted or non-instructional time. There are many ways to provide differentiation through the use of technology. A few of the strategies that have been identified in research are flipped instruction, online mentoring, and gaming.

Teacher Professional Development

The impact on digital devices is still being researched. "Although school one-to-one computing programs have been around for over 20 years, the literature base on such programs remains sparse" (Sauers & McLeod, 2017, p. 1). Much of how technology is used in the regular education classroom depends on how digital devices are implemented, how much training teachers receive, and the comfort level the teacher has with creating activities that require students' use of the device. "They revealed few teachers and students frequently used the laptops to support teaching and learning due to a variety of implementation issues" (Anthony & Patravanich, 2014, p. 6). A strong implementation plan can be important in how often teachers are willing to use laptops to support student learning.

Research conducted on schools that have implemented technology has found that "teaching experience and age of the general education teacher also affect attitudes toward technology and classroom computer use" (Shaunessy, 2007, p. 122). In the Shaunessy (2007) study they found that teachers younger than 30 years of age who were in their first few years of teaching were most likely to use information technology as a teaching tool and for student product development. These teachers have grown up in the current information age we live in and have a stronger comfort level in using technology in their daily lives. "Teacher use of technology strongly and positively explains classroom technology integration and student use of technology" (Ritzhaupt et al., 2012, p. 229). Younger teachers experience a higher comfort level due to the amount of technology to which they have been exposed. It is sometimes hard to convince veteran teachers that technology can be used in a positive way in their classroom.

In the Anthony and Patravanich (2014) study several teachers provided input when interviewed that they were not comfortable with students knowing more about technology than they did and that there simply was not enough time during the day to plan and monitor technology. Teachers stated their principal did not realize how much time and energy was required to integrate technology into their instruction. If teachers are looking at the integration as more work, and they do not have the proper support, devices will not be used in full integration.

Research has revealed a greater need to provide professional development before implementation to help engage these teachers in using digital devices technology in their classrooms. Sauers and McLeod (2017) found that "implementing a 1:1 program appears

to have a statistically significant impact on teacher behaviors (technology integration and competency)" (p. 16). Since research has identified such a strong correlation of device effectiveness with the teacher it is important to provide professional development for true integration.

> These findings suggest that future interventions should focus on improving teachers' attitudes toward computing in the classroom, on providing teachers with extensive modeling of curriculum modules, as well as opportunities to practice integrating the modules themselves. (Coleman et al., 2016, p. 290)

Professional development is an important part of implementing new ideas and technological approaches. "Ultimately, a piece of technology is a resource and how that technology is embraced and utilized by the teachers themselves is the ultimate variable of success" (Sutton, 2015, para. 9). When teachers fully implement devices into their classroom instruction their instructional practices change.

Need for Professional Development on Differentiation

In order for differentiation to occur, studies also state that professional development and teacher efficacy is important. In a study titled "Differentiation, Professional Development, and Teacher Efficacy," Dixon et al. (2014) found that those teachers who had more professional development in differentiation had more efficacy beliefs in implementing modified instruction in the classroom for their students because they felt comfortable making modifications which help students learn more effectively. "Even with access to numerous technology-based and non-technology-based resources, teachers may become overwhelmed and choose not to provide differentiated lessons" (McCoach et al., 2014, p. 272).

Dixon et al. (2014) stated that in inclusive classrooms it is important for teachers to receive professional development so they understood how to provide differentiation in their instruction to ensure maximum learning experiences for all students. When adding technology to schools, it is important to offer professional development that uses the differentiation model using technology. With this opportunity, teachers will be able to individualize learning for multiple performance levels in the regular education classroom.

Limitations and Lessons

Utilizing technology in the classroom can be a great tool, but it can also be a challenge if teachers are not using it to enhance the content they are teaching. There is also research which shows that teachers have the technology but may not be using it to its full capability in their classrooms:

> Although many schools are equipped with the latest instructional technologies, multiple studies have indicated that more than half of the teachers equipped with computers only use them for administrative functions, and only half their students report using technology more than once a week. (Mundy, Kupczynski, & Kee, 2012, p. 1)

It is important for teachers to attend professional development on how to appropriately implement and utilize technology as a valuable resource for student learning. "Many faculty members lack the technological proficiency needed to take advantage of these new technologies, making them unable to bring these technologies into the classroom and leading to many standing unused in the classroom" (Mundy et al., 2012, p. 1). Research shows that the way in which teachers are using technology in their classrooms greatly depends on how successful the technology is in helping the progress of their students.

"These findings provide direct evidence that both how technology is integrated into instruction and how frequently a teacher uses technology are significant and positive predictors of a student's use of technology in a school setting" (Ritzhaupt et al., 2012, p. 247).

It is also important that teachers understand the need to provide differentiation and enrichment activities to high-performing students. The Russell, O'Dwyer, Bebell, and Tao (2007) study identified the importance of teachers and leaders being exposed to new models of teaching which then in turn are used to capitalize on specific instructional uses of technology. If teachers do not change the way in which they teach then technology becomes just another resource. The Russell et al. study clearly states that teachers and school leaders would benefit from a more well-organized integration approach to prepare educators to use technology in and out of the classroom. Instructional technology can be used in and out of the classroom to provide instruction for students. Instructional technology can use asynchronously to provide differentiation for students. "Asynchronous online discussions are tools that teachers can use to make expert processes more visible and that can help them model, scaffold, provide feedback, and generally support student learning" (Boling & Beatty, 2010, p. 48). This is another approach to using differentiation for technology. For this study I draw upon an enrichment model to support my conceptual framework to blend enrichment and rigor.

Summary

The goal of studying how teachers are leveraging technology in the regular education classroom is to identify ways they are using the devices to provide

differentiation and enrichment to their high-performing students so those students will continue academic growth. Teaching all abilities in an inclusive environment is a challenge for most teachers; one complaint is not having enough time to teach high-performing students adequately. "Intellectually, they are more inquisitive, often asking more questions than a teacher has time to address in the course of a school day" (Hebert & Neumeister, 2000, p. 122). Lei and Zhao (2008) reported that students "visited teacher suggested Websites and used on-line programs which allowed them to expand their knowledge, complete exercises, review content, work on projects, and engage in discussions and debates with other classmates" (p. 108). Using technology as a resource may allow teachers to provide the enrichment students need by using digital resources. "In addition, they frequently learn at a more rapid pace and are capable of absorbing greater amounts of information than their peers" (Hebert & Neumeister, 2000, p. 122). Devices allow teachers to use a cloud classroom to manage different activities for students to be engaged in during class. "Typically, a cloud classroom refers to an easily accessible virtual space for students to communicate and participate in learning activities or tasks" (MacLeod, Yang, Zhu, & Shi, 2017, p. 2). This will allow teachers more flexibility in using their time more efficiently during the school day by leveraging technology for their high-performing students to delve deeper into the lesson and receive the rigor they need to grow. "Cloud classrooms have changed the capabilities of the educational processes in ways that provide increased flexibility" (MacLeod et al., 2017, p. 1). Throughout my research of the literature review I explored five main areas which

were: technology in the classroom, content strategies when teaching high-performing

students, enrichment, differentiation, and teacher professional development.

CHAPTER III

METHODOLOGY

Differentiation is a popular term used in education that means doing something different with different students to help them learn. This term can take on a different meaning depending on what ability levels one is referring to in context. I think that this is one of the strategies that good teaching embraces in order to see all students grow. For lower-ability students, teachers may differentiate by displaying content in different forms or using multiple resources to help better support learning. For high-performing students, differentiation can be used to dig deeper into grade level curriculum and use strategies that teach grade level content but at a more advanced level in order to get those students to grow. Many times, these high-performing students are demonstrating proficiency on standardized tests that count in accountability measures, but that does not mean they are showing academic growth.

Many high-performing students are on grade level as far as their performance, and often times above grade level, thus defining them as high performing. If students are not challenged with deeper curriculum activities and more advanced level content, they will not show growth from their year-to-year scores but will show proficiency each year. As educators, it is important that we implement strategies for each group of students to grow every year. Accountability and growth have become the focus of our schools and districts and state and federal legislators' biggest focus on improving education in America.

Therefore, high-performing students should be provided learning opportunities that are different from the grade-level curriculum due to the knowledge they already have, which requires more differentiation. Differentiation is a way to teach these students on their ability level, which requires teachers to use strategies that develop deeper questioning and higher-order learning to give these students the rigor they need in order to continue that individual growth.

It has been my perception as a principal that high-performing students are one of the most challenging groups with which to show growth. I wanted to identify common trends and topics from teachers who demonstrate growth on standardized test scores with high-performing students to identify successful ways that differentiation and curricular modifications are being used by leveraging digital devices in a heterogeneous environment which contains a mix of female, male, and multiple levels of learners. I used differentiation and digital devices in my research due to the lack of studies I found on the two topics and how they interrelate. Technology is currently so profound in the world of education, and I think it will continue to be as our society embraces the love for technology. It is going to be more important than it has ever been for schools and leaders to be on the cutting edge of how to use technology in a way that provides equity to all of the varying student performance levels while helping teachers find the most efficient ways to manage their time and energy in educating tomorrow's leaders. I hope my data will help district level leaders and teachers to see the need for providing a differentiated environment through digital devices for their high-performing students by learning common strategies and themes from my data to help improve the quality of instruction

provided to this group of students in a heterogeneous learning environment in their school.

Aim of the Study

In this study, I explored how teachers used digital devices to provide differentiation and enrichment to high-performing students in a regular classroom environment. In my review of the extant research, I identified what we know about digital devices being used to help provide differentiated learning activities for students and to help students better access curriculum on their level. I identified how teachers are using devices to help differentiate learning for high-performing students in their classroom. In this chapter I discuss how I carried out this qualitative study by conducting observations and interviews to gather data on how devices are leveraged in the classroom to provide high-performing students with differentiation and enriched activities by use of a device. I also discuss how I organized and analyzed the data collected and how I ensured trustworthiness of my research.

Research Question

The question I was interested in for this study was, "*How do teachers who successfully promote growth in high-performing students by using digital devices to differentiate learning for these high-performing students?*"

My secondary research questions were:

- What strategies that utilize digital devices do elementary teachers use to improve learning of academic content knowledge for high-performing students?

- How do elementary teachers enrich curriculum and instruction for high-performing students using digital devices?

- How do elementary teachers improve high-performing students' learning of higher-order thinking skills?

- How do elementary teachers improve high-performing students' learning of critical thinking skills?

- How do elementary teachers improve high-performing students' learning of creative skills?

I wanted to identify through research the best practices or strategies used by teachers who provide instruction to high-performing students by using digital technology in their classrooms. Through my research I hoped to identify ways that devices were being used in the classroom as a platform for building complex, higher-order thinking assignments and projects that help their high-performing students grow through enrichment activities that are provided to them. It is vital that educators begin using technological resources to help maximize instructional time and allow it to become a resource for both teachers and our students in the daily classroom environment.

Methodology

I conducted a qualitative research study. Lichtman (2013) describes qualitative research as an umbrella term:

> some people who conduct qualitative research do not appear to select any one particular approach but follow general principles that include hearing the voices of those studied, using the researcher conduit for the information, studying things in a naturalistic manner, looking at the whole of things, and avoiding testing hypotheses. (p. 70)

I heard the voices of the teachers who work with high-performing students every day, and I observed what was taking place in a digital heterogeneous classroom environment where all levels of students are being served. Classrooms and teachers are the best sources of information about the learning experiences of high-performing students.

Participant Selection

Background

In considering the criteria, I looked at classrooms that have experienced one-to-one digital devices for two or more years in order to see real integration, which grade levels would have an inclusive environment, and I also considered which classrooms were using devices with their high-performing students. It was also important to identify teachers who had been successful working with high-performing students based on EVAAS growth data. Once I developed my criteria, I shared them with my district's Director of Testing and Accountability, and he was able to share a list of schools that had at least three teachers who had met or exceeded expected growth with their high-performing group in Reading and/or Math in grades three through five.

After I received the list of teachers, I asked for volunteers to participate in my study. As an additional criterion for selection, teachers were asked who had used devices in their classroom for at least 2 years. I conducted interviews with the teachers of high-performing students in grades three through five to identify how they were leveraging digital devices to support high-performing students. I chose to conduct research at the elementary school level, where all ability levels are often served in the heterogeneous general education setting, whereas middle and high school students are typically leveled

based on ability. The elementary schools have also been digital in this district for 3 years,
so the technology has been available for teachers to use on a daily basis in their
classrooms. I chose two different schools where teachers have been identified as having
shown growth with their high-performing students. I observed and interviewed teachers
who had shown growth with high-performing students to identify concepts or strategies
they were using with digital devices that helped high-performing students grow
academically.

Site Selection

Based on the criteria listed above I selected to complete my research in
elementary schools in Blueridge County.[1] Blueridge County is a relatively small rural
district in North Carolina with 13 elementary schools, five middle schools, and four high
schools. The district serves approximately 10,000 students. All of the elementary schools
had digital initiatives for 3 years at the time of this study. In third through fifth grades
each student had a MacBook to use in the classroom.

Sites were selected based on the performance of their high-performing students on
accountability measures. It was important to identify high-performing students who were
making gains on their End of Grade testing in order to be able to gather data on how
teachers are leveraging devices to provide enrichment to their high-performing students. I
felt that it was important to select teachers who were seeing growth gains in this
subgroup because I identified in literature that just because classrooms are using digital
devices in a multitude of ways does not mean that students are maintaining their growth

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[1] All proper nouns in this study are pseudonyms.

performance. I conducted my research at School 1, School 2, and School 3 due to the volunteer participants who agreed to take part in this study. School 1 is located in a rural community in the Northwestern part of North Carolina. They have 300 students in Kindergarten through fifth grade. School 2 is located in a rural community in the Northwestern part of North Carolina. They have 500 students in Kindergarten through fifth grade. School 3 is located in a rural community in the Northwestern part of North Carolina. They have 400 students in Kindergarten through fifth grade.

Participants

Recruitment

For this study, it was important to gain multiple perspectives of teachers from different grades and different schools to gather data on how digital devices are being leveraged in the classroom. I began my recruitment process by sending letters asking for volunteers after I gained IRB approval. In order to conduct research in Blueridge County, I had to submit a written request to the Associate Superintendent with a description of my research study. Within a couple of weeks, I received an official letter of approval from Blueridge County Schools giving me permission to conduct research.

Participant Descriptions

The participants in this study were teachers who taught students in third through fifth grade. I chose third through fifth grades because students start official end of grade testing in third grade in North Carolina. I also decided to use elementary classrooms because some are still scheduled into classes heterogeneously. Hence, the heterogeneous environment will contain all ability levels in the classes I observed. I also selected

elementary schools because that is the only level where students have digital devices and have had them for 3 years as of the time of this study. I needed six teachers total who had used digital devices for at least 2 years and who had shown success with growing high-performing students in Reading and/or Math.

Since I wanted to focus on the high-performing group of students, it was important for this study to identify that group in order to observe and collect data on what activities are being assigned using digital devices. Therefore, I asked teachers to identify a time to observe their classrooms based on when they have high-performing students in their classroom during the day. I defined high-performing as students who score a Level 4 or 5 on the End of Grade assessment. This was the group that I identified as my high-performing group of students to discuss in the interviews with teachers, in the focus group, and through observations. The study did not investigate behavior of students *per se,* and no student data was collected in the study. No student names were collected in this study.

Data Collection

Observations

In order to complete this study, observations were required in the elementary environment. The elementary environment may include a heterogeneous group which includes all ability level students or a homogeneous which includes students who are close to the same ability level. All teachers were interviewed first and then following the interviews they were observed in their classrooms. The observations are important to identify ways digital devices are being used with high-performing students and what

activities are being given to students using devices that differentiate their learning from that of the other students in the classroom by altering their assignments in some way or offering higher level tasks to students that help provide enrichment. I collected data from interviewing and observing teachers on what is occurring with the activities, instructional materials, and learning materials that students who are high performing were assigned.

I used the conceptual framework model from Renzulli's Enrichment Triad Model to gather data on how teachers are using devices to provide enrichment activities to students through the use of digital resources by looking at the three phases of the conceptual framework model. I completed one or two separate 90-minute observations of each of six teachers, which resulted in 12 hours of observation data collected. "Observing humans in natural settings assists our understanding of the complexity of human behavior and interrelationships among groups" (Lichtman, 2013, p. 224). I completed observations to observe teachers' processes and procedures, to observe how work is assigned using digital devices, and to see what type of activities are assigned that involve the devices. The observations provided me with insights into how the classroom teacher has the classroom structured in terms of classroom environment and daily routine. I observed the teacher during the time students were in a both heterogeneous and homogeneous setting with the teacher and they were using devices to complete their classwork in Reading or Math.

By observing after the interview, I was able to understand some of the strategies and ways that teachers were leveraging devices with their students. This helped deepen my research. Then, after I completed the observation, I was able to meet with the teacher

again for about a 30-minute follow-up interview to clarify any questions I had or activities that may have not been discussed in the interview.

In my observation protocol, I looked to see how devices were being used in the classroom environment and how they were being used to assign work or activities to high-performing students versus other students in the class. I looked to see if they are used more in group instruction or individual guided instruction to certain groups. I looked to see how independent high-performing elementary students are on completing activities assigned. Through my observations I gained a better understanding of how the teachers are leveraging the devices to provide enrichment for their high-performing students.

Interviews

This study required individual interviews with the teachers who teach these students in the classroom. The Pezalla, Pettigrew, and Miller-Day (2012) study examined the qualitative interview as a collaborative enterprise, an exchange between two parties, reflecting on the ways in which the interviewer affects the organization of this talk-in-interaction and the processes by which the talk is produced. The interviewer's role is important in affecting the responses received from the interviewee: "Because the researcher is the instrument in semi structured and unstructured interview, unique research attributes have the potential to influence the collection of empirical materials" (Pezalla et al., 2012, p. 165).

After I identified the participants, I emailed letters to each teacher identified as making growth with high-performing students. After I had six volunteers to participate in my study, I set up interview times. I interviewed six teachers from three different schools

(for a total of six teachers). After I identified the teachers, teachers were asked to be

interviewed in their classrooms where they would feel more comfortable. They were also

asked to show or reference an artifact that came out in the interview process like sample

lesson plans that show differentiated activities for high-performing students, links to

websites, or sample assignments that are used with students.

I used interview questions for teachers. I designed one set of interview questions:

Questions for Teachers (see Appendix D). I interviewed a total of six teachers from

different schools on one or two different occasions. The interview length was anticipated

to be about one hour, but the actual interview times ranged from 90 minutes to 2 hours.

Interviews were digitally recorded using a smart device and a digital recorder. Interviews

with participants were conducted using a semi-structured interview process. "Semi-

structured, open-ended interviews involve the use of structured and unstructured

questions, meaning some of the questions will be developed in advance while others will

evolve as the interview progresses" (Lunenburg & Irby, 2008, p. 174). The interviews

were conversational, allowing the interviewees to share their story about what they have

experienced and observed in their classrooms. For my study, I conducted a contextual

type of interview. Lichtman (2013) explains that in a contextual interview it is important

to consider the particular time, events, and context in which the interviewee experiences

life.

Interviews allowed me to reveal the real story and experience by talking to the

professionals who work with students on a daily basis. Interviews set "up a situation in

which the individual being interviewed will reveal to you his or her feelings, intentions,

meanings, sub contexts, or thoughts on a topic, situation, or idea" (Lichtman, 2013, p. 190). The real stories are found in the classroom from the teachers who are working with high-performing learners. Their insights and invaluable experiences in working with students on a day-to-day basis can be an amazing story that should be shared with other teachers. They know better than anyone about what they are creating, using, and assigning to learners in their classrooms. I talked to teachers and found out how they were leveraging devices in their classrooms to help students receive differentiated instruction to help them grow. I identified how teachers are working with high-performing students in their classrooms by using digital devices. I anticipated that they would be able to talk thoughtfully about their experiences and strategies they have used to help high-performing students learn. The interviews were uploaded to Box, a secure cloud-based file-sharing program, and transcribed the interviews to prepare for coding which were analyzed and are discussed in my findings chapter (Chapter IV).

Focus Group

After the observations and personal interviews were completed, I met with all participants but one in a focus group interview to follow up on questions or ideas that were not clear through the observation or personal interviews. "Focus groups are a recognized way of exploring the opinions, beliefs, and attitudes of a group of people and of enabling people to respond and interact together" (Birt, Scott, Cavers, Campbell, & Walter, 2016, p. 1805). Lichtman (2013) states that what distinguishes focus group interviewing from qualitative interviewing with a single individual is that it allows for

group interaction that may trigger thoughts and ideas among participants that did not emerge through the individual interviews.

The focus group consisted of five of the six teachers. The focus group lasted for approximately one to two hours. "It provides opportunities for members of the group to interact with each other and stimulate each other's thinking" (Lichtman, 2013, p. 189). I focused on ideas or questions raised in the observations and individual interviews. The focus group responses were digitally recorded. I took detailed notes and then listened to the recording multiple times to pull related themes that came out of the interview transcriptions and observation notes. This helped me analyze the results, which are discussed in my findings chapter. I finalized the topics and questions for the focus group after the individual interviews and observations of all six teachers were completed.

Data Analysis

As observations and interview transcriptions were completed, I began analyzing data. By doing this I was able to refine methods and respond to what I had learned so that I may clarify or change questions in my focus group. I reviewed the notes from all observations, transcribed the digital interviews, and analyzed the focus group interview. I compared the responses of the interview participants and focus group responses which were coded to identify overall concepts and strategies in the study. I read the transcriptions and observation notes five to six times each. The first couple of times I highlighted individual words, concepts, or quotes that I felt help answer my research questions. After I completed this I wrote the individual words, concepts, and quotes in my reflection journal. Then I started trying to organize those into some common themes.

The coding process identified in Lichtman (2013) was how I analyzed the data in my study. I started as Lichtman suggests: "preliminary coding involves moving from raw data into identifying important elements" (Lichtman, 2013, p. 244). In this process, I identified "code words, phrases, and segments"; these are codes that are common in my interviews and focus group responses (Lichtman, 2013, p. 248). This was completed through reading the responses and marking large chunks of material. Then I categorized the chunks and organized the coded data into categories. After all of the interviews and responses were coded and categorized, I looked for overlap or repetition. I needed to further dissect and rename some codes. I worked to combine some of the codes and categories into more overarching themes that will be used to draw meaning from the study. "The use of coding and framework provided a clear trail of evidence for the credibility of the study" (Nowell, Norris, White, & Moules, 2017, p. 7).

Creswell and Miller (2000) describe a systematic process for coding data in which specific statements are analyzed and categorized into themes that represent the study's main findings. I drew upon and utilized the coding methods adopted by Grounded Theorists, including open, axial, and selective coding (Lichtman, 2013). After interviews were conducted, I used open coding to create a simple list of codes that represent what I thought interviewees were trying to convey. From these I developed themes regarding key concepts that I identified through the data collected, which is called selective coding. I looked to use selective coding but my study did not allow it to be narrowed into a single focus. I analyzed the level of coding that was fitting for my study to identify certain themes that could be used to identify concepts and best practices found throughout my

data. In my data I highlighted words, concepts, and quotes found in the interview transcriptions and observation notes by reading through them multiple times. Then I went back to write the words, concepts, and quotes down. After I created a list I went back and tried to sort them into overarching themes in the research. "A theme is an abstract entity that brings meaning and identity to a recurrent experience and its variant manifestations" (Nowell et al., 2017, p. 7). Following this process, I was able to identify key concepts and strategies through my analysis that "provide a concise, coherent, logical, non-repetitive, and interesting account of the data" (Nowell et al., 2017, p. 7) which will help teachers who teach high-performing students to better serve their high-performing students in digital settings.

After I analyzed the data, this research allowed me to identify multiple points of view about how technology is being leveraged in the classroom and helped me to gain insight into how teachers support high-performing students through the use of digital devices, including what resources they use with students and how they are differentiating instruction to meet the needs of their high-performing students.

Trustworthiness

"Trustworthiness is *the* way we work to meet the criteria of validity, credibility, and believability of our research" (Harrison, MacGibbon, & Morton, 2001, p. 324). Trustworthiness is important to qualitative research because "the trustworthiness of our research practices is inherent in the politics of what we do at any and every stage of the research process" (Harrison et al., 2001, p. 324).

There are multiple ways to establish trustworthiness in a qualitative study. One of the procedures I used to establish credibility was to "describe the setting, the participants, and the themes of a qualitative study in rich detail" (Creswell & Miller, 2000, p. 128). Thick description means more than this. "Member checking, also known as participant or respondent validation, is a technique for exploring credibility of results" (Birt et al., 2016, p. 1802). I used member checking as a validation technique to help ensure the trustworthiness of my study. Once the interviews were completed, I sent each participant a transcribed copy to review for content and accuracy. "The method of returning an interview or analyzed data to a participant is known as member checking, and also as respondent validation or participant validation" (Birt et al., 2016, p. 1802). Validating participant responses reduces the potential for researcher bias. When I completed the second follow-up interview, I asked participants to clarify any points or correct and parts of the interview transcript. Each participant validated their transcript of the interview.

Positionality

I also helped try to ensure the trustworthiness of this research by trying to identify my own perspectives and understanding of this research topic. Lichtman (2013) states that in qualitative research, each idea, interpretation, and plan is filtered through the researcher's eyes, mind, and point of view. The lens that the researcher provides is critical in gathering, analyzing, and interpreting the data. It is important for the researcher to identify that lens and to be aware of those perceptions in order to approximate neutrality. As the researcher, I hoped to use my perspectives as a guide to build on further understanding but not to allow my preconceived ideas to interfere with interpreting the

perspectives of my participants. As a principal in the county where the research was conducted, it was important to identify my personal assumptions so they did not affect my findings.

Creswell and Miller (2000) define researcher reflexivity as a validity procedure for researchers to self-disclose assumptions, beliefs, and biases that may shape inquiry. Lichtman (2013) identifies this process as a critical reflection on the practice and process of research and the role of the researcher. As the researcher, it was very important for me to be aware of my own personal perceptions and how they could affect my understanding of the research. Therefore, I included reflexivity notes in my research so that I was better able to identify my personal assumptions that could affect the findings of my research. I kept a reflexivity journal throughout this study to record my thoughts and key takeaway ideas from my interviews and observations. I reflected and recorded notes after each interview or observation.

I looked across the individual interviews, the focus group responses, the observations, and the literature review to triangulate data. "Multiple data collection methods and member checking are appropriate methods to adopt within a subtle realist approach, enabling a triangulation of knowledge about a single phenomenon" (Birt et al., 2016, p. 1803). After completing the interviews, observations, and focus group interview, I was able to identify common trends and concepts to create a more conceptual understanding. Having three forms of data collection is a great way to demonstrate triangulation by looking at three different methods of collecting data. Lichtman (2013)

states that triangulation can help establish validity for data gathered in research. Triangulation of the data I collected helped strengthen the interpretation of the data.

Summary

In this study I sought to gather data on how teachers are using one-to-one devices in their classrooms to differentiate and provide enrichment for high-performing students. I wanted to gather data on best practices and strategies they were using that were successful in helping high-performing students grow and then share those strategies with other educators and schools. The world has evolved into a high technology-driven society where more and more daily tasks are being driven by technology. Therefore, the devices are a viable solution in helping teachers provide the support that high performers need. To gather this research, I conducted a qualitative research study that used research practices from multiple qualitative methods. I conducted interviews with teachers, I conducted observations of their classes, and I conducted a focus group study to gather data to answer my research questions.

Through research I have found that a digital environment is a great way for teachers to leverage technology so that differentiation can be provided in the classroom for students with varying abilities. Numerous studies report that the effectiveness of computers in raising student achievement depends on teachers (Barron, Kemker, Harmes, & Kalaydjian, 2003; Garthwait & Weller, 2005; Newhouse, 1999; Norton, McRobbie, & Cooper, 2000). The way that devices have changed instructional practices from the teacher targeting more independent learning needs instead of a group-focused approach seems to be reflected in multiple studies. Most of the research discusses the use of digital

devices or technology-rich environments as being more of a student-centered learning

environment instead of the traditional environment where it tends to be teacher-directed.

> This indicates a change from learning environments where the teacher and the textbook structure, define and control the learning process, towards student-centered learning environments where the students themselves are the main frame of reference for defining the learning process. (Erstad, 2003, p. 11)

CHAPTER IV

FINDINGS

In this chapter I present the findings of the research conducted on the teachers of the study. The results are derived from analysis of the interviews, observations, and focus group responses. The study focused on the overarching question: How do elementary teachers who successfully promote growth in high-performing learners use digital devices to improve learning for these students? Several secondary questions were considered to build a better understanding of the teacher:

1. What strategies that utilize digital devices do elementary teachers use to improve learning of academic content knowledge for high-performing students?

2. How do elementary teachers enrich curriculum and instruction for high-performing students by using digital devices?

3. How do elementary teachers improve high-performing students' learning of high order thinking skills?

4. How do elementary teachers improve high-performing students' learning of critical thinking skills?

5. How do elementary teachers improve high-performing students' learning of creative skills or is this creativity?

In order to answer the questions of my study, I conducted one to two interviews with six teachers from three different schools. I also observed each of the teacher's classrooms. Lastly, I conducted a focus group with five of the six teachers. After I completed the individual teacher interviews, I set up an observation to go and observe how the one-to-one devices were being utilized in the classroom. The observations ranged from 90 minutes to 120 minutes each. I observed four classes that were considered homogeneous which meant the students were leveled. The students in the classroom were all considered high-performing students, which are students who scored a Level 4 or 5 on the EOG. Two of the classrooms I observed were heterogeneous and had multiple levels of academic ability within the group. This was called an inclusive environment or grade level Reading. I observed three math blocks and three Reading blocks.

The participants were identified through EVAAS data as teachers who had made growth with high-performing students who scored a Level 4 or 5 on the EOG test in Reading or Math. After I identified those teachers, I sent letters to the teachers through email asking them for their volunteer participation. I had six teachers respond that they would participate. All six teachers are in kindergarten through fifth elementary schools and teach fourth or fifth grade. I set up a time for their interview to be conducted first. I used pseudonyms to protect the participants' identities in this study.

Participant Profiles

Amy

Amy has been teaching for 23 years, all in elementary school. During my observation, she had 25 students in her classroom who had been homogeneously grouped based on their abilities, which range from fourth grade to seventh grade ability in Math. Amy has had MacBooks one-to-one in her classroom for going on 4 years. During the interview she stated, "I think success in my classroom looks like a productive struggle, and that productive struggle's going to lead to self-discovery, and self-monitoring, where they'll identify their own reflection and identify their own short comings." She wants students to be able to try new things and for students to find ways to do math without being directly taught. She feels that high-performing students should be good at risk taking, self-reflection, and self-motivated to grow.

Amy stated that students needed to be weaned off direct instruction that they are so used to having in their earlier years in elementary school so they can become independent learners. During the observation students logged onto Google Classroom to see the stations they were going to work on during class. The teacher went over the expectation for all stations and told students she would give them their next assigned station when the timer went off.

The concept being taught was prime and composite numbers. The stations were using a Venn Diagram with cut out numbers. Students were to draw a Venn Diagram on the desk using an erasable marker. Then they were to pick two categories that were in the

baggie. The students had to sort the numbers based on the categories they picked which were prime, composite, multiples of two, and multiples of 12.

The second station was Spot the Imposter, which was in Google Classroom. It was several problems set up on a slide, and students had to identify the number that did not belong. Then students had to create a Google Slide explaining why the number did not belong. The third station was a Hyper Doc that allowed students to work in different programs like Ed Puzzle, Kahn Academy, Accelerated Math, and Prodigy. Then one station was working on different problems with her that had students explain why they thought the number was wrong and how the problem could be corrected. Students worked together in groups while in three of the rotations. All students were highly engaged and completed their work. When students had a question, they started with asking a peer and then if they needed more help they went to the teacher.

Annie

Annie has been teaching for 12 years all in elementary school. In the observation she had 20 students in her classroom who have been heterogeneously grouped in Reading which means the students are on different reading levels. Annie has had MacBooks one-to-one in her classroom for 4 years. During the interview she stated, "providing differentiation is giving your high kids more thought-provoking questions, kind of digging deeper to their answers and not just letting them get by with simple answers." Annie feels that high-performing students sometimes work harder because they realize their true potential and have a newfound intelligence for them, so they push for it and are motivated to do well. She feels that technology is changing so fast that there is always

something else she could be doing to get her kids to grow. Learning is now endless due to the resources that technology provides.

During the observation students logged onto Google Classroom to see their assignment for the day. Different students had a different colored Google Classroom based on their level. Students also picked up a folder as they entered the room with individualized work, spelling, and vocabulary. The teacher went over the different rotation that students were supposed to complete by the end of class. The first rotation was Spelling using Word Within a Word, the next rotation was to Read Chapters in the novel assigned to their reading group, the next rotation was to answer questions from the text, draw an illustration, and write reflection questions on the way the character feels, the next rotation was to look up creative words in Dictionary.com that were listed in their Google classroom, and then the last station was with the teacher. The teacher was going over vocabulary from the novels and how to use the words in context. She had different words for different groups based on which words they needed. Students worked together in groups of three while in the rotations. All students were highly engaged and completed their work. When students had a question, they started with asking a peer and then if they needed more help they went to the teacher.

Amelia

Amelia has been teaching for 17 years, all in elementary school. In the observation she had 21 students in her math classroom who had been heterogeneously grouped. She has a heterogenous group in Math and a homogeneous group in Reading that had 20 students in the class. I was able to observe both classes. Amelia has had

MacBooks one-to-one in her classroom for 4 years. During the interview she stated that "she gives high-performing students a little bit more freedom, than I do the other students because they learn—like I don't want to quench their learning." She wants then to be able to talk and discuss ideas with other students so they can learn from each other.

I started the observation by observing her math class split into heterogeneous groups. The teacher likes to group a low-performing kid with a high-performing kid in her heterogeneous group. She feels it requires the higher student to learn how to work with others and gives the lower student a chance to work up to their potential by placing them with a higher student. Students had been assigned the task of writing their own story problem in math by using the order of operations. Students had to write their story and then explain how to solve it. The story had to make sense in the explanation. All groups were engaged and collaborating on their ideas to create their story.

I was also able to observe Amelia's reading class that was grouped by reading level. The high-performing students in reading were told to get their reading text book, their folder, and computer. Students worked on sequencing and chronological order. Students got to select from three different passages on How to Become a Scientist. After choosing the selection students assembled into a group and created five events from the text on what it would take to become a scientist. The requirement was to use a proof out of the text and then to create a sequence of events to answer the question. The teacher did not set any parameters on what the slides should look like or how many students should create it. Each group looked a little different in the way they laid the five events out and the presentation of information. Students were all engaged and kept reminding each other

about the assignment details and how much longer they had to complete the assignment.

Then the students shared their final product with the teacher by sharing the Google

document.

Abby

Abby has been teaching for 14 years in elementary and one year in middle school.

In the observation she had 32 students in her classroom who had been homogeneously

grouped in fifth-grade leveled math. The students in her classroom ranged from fifth

grade to above eighth grade in their math ability. Abby has had MacBooks one-to-one for

going on 4 years. During the interview she stated, "students should have a feel of choice,

so they can have a lot of buy-in." Abby used the example of the

> tortoise and the hare, you know you can sit by the sidelines and think well I know
> everything so I want them to try the challenge first, and if they're not getting that,
> then I want them to go back and look at the instructional video, so they're—it's
> teaching them how to look for their own mistakes and take ownership of their
> learning.

She tries to use technology in ways students will see it in the job field. Abby feels that

high-performing students need to struggle a bit and learn from their mistakes. She stated,

"I spend more time just trying to challenge them a little more with their product most of

the time." She believes her role is more of a facilitator then teacher in her classroom. She

stated, "Well now, like the whole world's open, so it's like when you get done, that's the

whole smart choice math thing, like you don't have to stop learning, and it's not like a—I

get a break, it should be—I'm, you know, it can allow the kids to continue to accelerate."

During the observation students received an exit ticket when they walked in the room. On the exit ticket was a picture of a shape made of cubes. The teacher facilitated a cube talk which is like a number talk. Students had to come up with a strategy to find how many cubes would fit into the shape. After students came up with a strategy they got to turn and talk to a peer to discuss their strategy. Then students told the class their strategy. Students were told to get onto Google Classroom. They all had the same assigned Google Classroom. In the classroom they had a Hyperdoc with different activities and assignments they could choose from. One of the activities was using a bullet journal and Blend Space which is a digital resource where there were three videos on Volume. Students were required to watch at least two videos and take their own notes on Volume. They had to write the formula on Areas, Perimeter and Volume. Then they had to find two real-world examples. The other assignments on the Hyperdoc were application assignments that used a Frayer model on google documents where students had to define volume, find real-life pictures of examples that represent volume, and examples that do not represent volume. Abby utilizes the flipped classroom approach in her classroom.

Addie

Addie has been teaching for 20 years in elementary and served as an Academically Gifted Coach for three and a half years. She has a homogeneous fifth-grade math group that is leveled by their math level. The students in her classroom range from fourth grade to above 12th grade in their math ability. Addie has had MacBooks one-to-one for going on 4 years. During the interview she stated, "when there's one of me and

I'm working with a group of students, then that device becomes their window into the world, so to speak, you know, they can, like I just said, they can be doing anything that they need to be working on." Addie said,

> if you know how to implement the device and teach your kids how to use them to benefit them in their academics, they can just learn so much, you know, they're just sponges, and I think that it's kind of made it harder on us because now because we have devices, we can cover more material and they expect us to teach them more.

During the observation students used their devices to work on a School Net test which is an online assessment through the North Carolina assessment program. As students worked on the assessment, the teacher was sitting at a table monitoring the live data analysis. The reason she was monitoring their work was to call students back individually or by small groups to reteach that particular skill they were marking incorrect on their assessment. When students were called back to the table the teacher asked them to explain how they answered the problem. Sometimes the student would recognize the mistake on their own and other times the teacher would reteach the skill. After the assessment students used a program called Freckle which is an online program that allows students to take a preassessment and places them on work they need based on their ability. This program allows students to write on a white board digitally to draw the problem out while solving it. There was one student that the teacher pointed out in the classroom who was well above the fifth-grade standards that she was expected to teach and that technology allows him to go on to sixth grade material and beyond. She stated, "that is the awesome thing about technology because I could never do that, take him onto

sixth grade content because the expectation is for me to master the fifth-grade content with all my students."

After students were finished the teacher moved onto the lesson on decomposing multiplication problems. First, she had students to define what they thought decomposing means; students collaboratively came up with the definition to break down. She passed out small whiteboards and had students come up with as many different ways to decompose the problem 28x14. Students worked on writing different ways on their whiteboards. Then she pulled out her iPhone to hover over their work to display on an Apple TV so students could see what other students had done to decompose. The teacher selected different students to discuss what they had come up with, which they then discussed as a class. There were a few students who had come up with very creative ways to decompose the number and Addie discussed each way with students.

Abigail

Abigail has been teaching for 18 years in elementary school. She has a heterogeneous fourth-grade reading group of varying levels of reading ability. The students in her classroom range from second-grade to above seventh-grade reading level. Abigail has had MacBooks one-to-one for going on 6 years. During the interview she stated that differentiation means, "I would think challenging, make it a little bit harder." "Sometimes they are not use to struggling and when they do they have a hard time, they don't know how to handle it." She utilizes Google classroom to individualize assignments not just to different groups but individual kids. The teacher feels that assignments should be "the hands-on, the concrete to the representational to the abstract."

During the observation she utilized Google Docs to post a question about the reading selection students had been assigned. Students collaborated on a question about child labor laws. The assignment was on Google Classroom. The task was to read a passage on Child Labor Laws, answer the question discussing organizations that may have helped protect children in the 1900s, and then comment on three of their classmates' responses. The teacher allowed me to look at her computer screen at her table to look at how students were responding to the question. It was interesting to observe answers from high-performing students versus the lower students. What was most interesting is how some of the high-performing students would read over the lower-performing students' responses and add a comment like keep going, don't forget to restate the question, don't forget to use capital letters, and gave them positive feedback. Other comments would reflect further on topics, or list a different thought for the student to think about. The teacher was also reading the responses and helping students as they worked. Students were all engaged and so interested in the comments their peers had entered.

Themes

In this study I conducted six 45-minute to one-hour interviews with all six participants. Through the six interviews that I conducted there were several themes that emerged. After getting the interviews transcribed, I started reading and highlighting words or phrases that helped answer my research questions. After I went through all of the interviews five or six times, I started listing all of the words and phrases in my journal. After I listed them, I tried to pull them into categories. Then after I sorted the

words, concepts and quotes I created common themes that emerged to answer my

research questions. The common themes I revealed were:

- Attributes that help define the success of high-performing students in the one-to-one classroom;

- A list of programs that participants have used with students using one-to-one devices in the classroom;

- What growth strategies participants are using with high-performing students in their classrooms;

- What the learning environment looks like in a one-to-one classroom with high-performing students; and

- What differentiation is being given to high-performing students using the devices. (see Table 1).

Table 1

Themes

Defines High-performing student's Success	Programs Used with Devices	Growth Strategies	Learning Environment
Work until you get question	Google Classroom	HyperDocs	Make
Facilitate Communication	Kahn Academy	Genius Hour	Design
Provide Choice	Ten Marks	3 Acts Math	Collaborate
Self-Discovery	Prodigy	Question/Video/Answer	Create
Productive Struggle	Math Antic's Video	Research	Risk taking

Table 1

Cont.

Defines High-performing student's Success	Programs Used with Devices	Growth Strategies	Learning Environment
Risk taking	Ed Puzzle video	Google Form	Wean off direct instruction
Self-reflection	Kahoot		Flexibility
Self-Motivation	Quizizz		Choice
Self-Monitoring	Freckle		Flipped instruction
Reflection	Quizlet Live	Differentiation	Live data tracking
Exploring		Different Objectives	Expansion
Mastery		Different way to express	Extension activity
Self-management		Different timing	Research
Nudging them		Way to access material	Explore
Peaking Interest		Learning experiences	Competition
Real life		Opportunities	Monitoring
Manage things		Pacing	
		Levels of teacher interaction	
		Interaction with content	
		Physical environment	

Observations

After I completed the teacher interview, I set up an observation to go and observe

how the one-to-one devices were being utilized in the classroom. The observations

ranged from 90 minutes to 120 minutes each. I observed four classes that were

considered homogeneous which meant the students were leveled. The students in the classroom were all considered high-performing students which are students who scored a Level 4 or 5 on the EOG. Two of the classrooms I observed were heterogeneous and had multiple levels of academic ability within the group. This was called an inclusive environment or grade level Reading. I observed three math blocks and three Reading blocks. Every classroom was set up in small groups and rotations. Students started at one station and moved to a new station after a timed period. Some of the stations required students to complete independent work and some of the station required group work. One of the stations was usually guided instruction led by the classroom teacher. Part of the stations involved some use of technology for recording responses, watching video, developing a product, or researching a topic. Some of the stations were hands-on manipulatives. All of the teachers walked around to all of the groups as a facilitator. Some teachers were using live data feeds to check student progress and reteach a skill that students were struggling with. Instant feedback is one area teachers stated has improved by having one-to-one devices in the classroom. Teachers can now track student weaknesses and redirect their mistakes instead of waiting until the next day to address incorrect problems.

Focus Group

I conducted a focus group that included five out of six of my participants. The five teachers who attended provided meaningful discussion and responses to the 20 questions that I created for my focus group. The environment in which they felt high-performing students do best in is when students take over the classroom in a flipped

approach where the teacher serves as a facilitator of learning. The teachers act as a facilitator that guides students to be engaged and responsible for their learning. The facilitator approach lends itself to a flipped approach where "it's all about the students," as one participant said. They all felt that it was important for their high-performing students to have choices and get to be in charge of their own learning in order to be fully engaged. It was interesting that they felt that with high-performing students they oftentimes try to "check the boxes and get all of their work done"; then they have their own ideas for what they want to work on. High-performing students will often rush through their work if it is below them but with devices when I place them in groups sometimes it slows them down because they get to think about different ideas that the other student has on accomplishing the task. All five teachers feel that having one-to-one devices has changed their teaching style from teaching whole group instruction to a differentiated facilitator approach. This approach allows them to give students the appropriate leveled work that differentiates for their learning needs. Annie stated that devices allowed them now to differentiate throughout the day instead of having to find a time to pull kids for enrichment, which is what she had to do before the devices. Addie stated that her "students can cover more independently than I can keep up with monitoring." Annie stated that with devices it sometimes requires the teacher to be in 15 different places at one time in their head, with checking this and helping this student with this, but the kids are getting their needs met. Devices also allow more positive collaboration which sometime requires students to go deeper in their thinking. Amy stated that when students work together it makes them slow down and think about how

others are processing information or creates great discussion with high-performing students. Devices have allowed teachers to maximize their time. Abby stated there is not any down time now, there is always a task that can be assigned when they finish what they are working on. The discussion during the focus group was very rich in discussion and many of the ideas validated the interview responses. The teachers are using the devices in multiple ways to help provide adequate instruction for their high-performing students.

Teachers' Use of Digital Devices

All of the teachers who participated felt that one-to-one devices have allowed endless possibilities for resources and learning materials to which students have access at all times. This has allowed students the opportunity to collaborate with not only kids in their class but on a global level. The teacher participants felt they had received appropriate professional development but would like to have more support on implementing things they learn after they attend a PD session. They also stated that professional development where teachers have choice to what is offered, like EdCamps, were more beneficial. EdCamp is a strategy to provide professional development where teachers decide on the topics that are covered during the professional development camp. All participants submit a few topics on which they would like professional development and then all participants vote on what is provided. Then there are several different sessions to attend through rotation. They felt this is more beneficial because after having one-to-one devices for 3 years they felt like the range of teacher knowledge had grown among the teachers in the building. Some teachers had attended everything they could

and were using the devices to enrich and differentiate, whereas some staff had been resistant and were still using the devices as a replacement tool for instruction.

Computer classes have been eliminated from the schedule due to students utilizing the one-to-one daily. The laptops have created more time on task for students and transition time has decreased. All of the centers and resources are right in front of them on their laptop. Program time to practice has increased by the loss of transitional time. The devices have most resources available on them so very little is needed as far as other materials or having to transition to other areas. More independent learning is happening, and resources are readily available. Students are using the devices on a daily basis so many of the participants stated that they have to monitor students using the devices to prevent behavior problems. The participants stated that most of the time students were very engaged and they did not have many problems. They also stated that students need to be monitored to keep them from being on inappropriate sites or to keep them on track.

Teachers who teach high-performing students use flexible grouping, they assign activities that give students choices, and most strategies that the teachers are using assign leveled work to students based on their present ability, which means they are providing differentiation. One-to-one devices allow teachers to be able to act as facilitators by allowing them to flip the classroom and place the focus on students. The structure of most of the classrooms that I identified through the interviews and observations conducted showed curriculum activities given to high-performing students that allowed them to collaborate and communicate with their high-performing peers. Some of the teaching

strategies that emerged through research placed a larger responsibility on the student, for example, the creation of questions and materials; finding and identifying resources via online; and students finding text, pictures, or videos to guide them in their work. Students can keep exploring deeper content and come up with ways to present information that allowed them to use their creativity.

My interview participants felt that the one-to-one devices has allowed the classroom to be transformed into providing the appropriate instruction for all students. It has allowed them to utilize the time in class more efficiently by being able to assign students different tasks on a platform like Google Classroom or Canvas. Students then can open the differentiated assignments and work on the tasks they need to help them grow. By having different assignments and differentiated work high-performing students have been able to work on assignments and material above grade level in order to continue their growth. Participants say before devices that was harder to do because they tended to teach to all students and that they had to plan more to cover content in ways that students learn best. The devices have allowed students to choose the way in which they learn content and to choose how they complete the assignment based on their interests and how they learn.

One of the reasons I was interested in this study was to look at how schools are using digital devices to help teachers better utilize their instructional time and resources in improving instruction in the elementary classroom. The observations showed teachers are using devices to reach all students in their classroom by assigning tasks based on the students' individual learning needs. Every classroom was set up in small groups and

rotations. Students started at one station and moved to a new station after a timed period. Some of the stations required students to complete independent work and some of the station required group work. One of the stations was usually guided instruction led by the classroom teacher. Part of the stations involved some use of technology for recording responses, watching a video, developing a product, or researching a topic. Some of the stations were hands-on manipulatives.

Teachers are using many different strategies on a daily basis utilizing devices. Some of the resources they are using are Google Classroom, Khan Academy, Freckle, Checks for Understanding, Accelerated Math, STAR Reading and Math, Research, Videos, Creation of Google Drawings, Spreadsheets, Word, and Power Point. They are using strategies that allow students choices, collaboration, creation, application, synthesizing, and reflection.

Classroom assignments were all housed in Google Classroom or Canvas. Students log in daily and go to their Google classroom to access the assignments and activities for the day. Most assignments were very open-ended and allowed students to make many choices in creating the end product. Flexibility and choices are two areas that all classrooms used in their assignment options. Instead of assigning the same grade level task to all students and the same assignment, I saw options in the classrooms that I observed. Several of the teachers used menus, a blank slate using Google Docs, Hyperdocs, rotations in the classroom, and rubrics. Students were expected to be self-sufficient and independent.

Google Classroom is a digital classroom that allows teachers to set up different groups. Google classroom was used by all participants to assign student work and activities for students daily. These digital classrooms are set up to provide different leveled assignments for students based on learning needs without students being able to recognize their work is different. Many of the participants used colors to name their groups like the red group or blue group. Students were directed to go to their Google Classroom when it was time to start class. In the Google Classroom were linked documents, questions, videos, HyperDocs, Google Slides, Google Docs, Links to other programs, resources for students to view, and directions. Students can not only preview assignments for the day but the classroom also allows them to submit their work for the day back to the teacher.

Khan Academy is an online program that has tutorials of content and then has practice exercises that help students focus on personalized learning. Teachers can pull standards and work from this program that allow students to work at their own pace. This program is used a lot for students in learning more on a topic or a how-to video, it can be teaching students how to do something and then it gives questions to check for understanding.

Freckle is a math program that allows real time data that teachers can use to assess students in math.

Checks for Understanding is a strategy that is used by many teachers to check what students know and what they understand. Checks for Understanding was a concept that kept emerging in the interviews. Checks for Understanding can involve multiple

strategies where students complete some type of short assessment to check what they know. Assessment is an important component when working with high-performing students. It is important for teachers to use pre-assessments and checks along the way to see what content students have mastered and what they need more instruction on. There are many different ways in which checks for understanding can be given. I observed the following strategies being used through the Interviews and Observations. Checks for Understanding included questions listed in a Google Doc. Students had to create application of content in Google Drawings, Google Spreadsheet, School Net tests, assessments in STAR, Freckle, accelerated math, read theory, quizizz, quizlet, discussion threads on Google Classroom, Math Antics, Ed Puzzle, and Kahoot. All of these programs allow teachers to see what students have mastered. Some of the resources are short assessments, but some of the resources allow for students to create and analyze content on a higher learning level.

Three Acts Math is a strategy that was created by Dan Meyer that can be accessed on TED talk that allows students to solve a real-world application problem in three acts. Act one is a video or a picture of a real-world problem for students to make inferences or observations on what is transpiring. After students are shown the first act they write observations and possible ways to solve the problem, they identify missing information, and make notes of resources they need to solve the problem. In Act two the video reveals one missing piece that is crucial in helping solve the problem. Then students work to try and solve the problem based on the information they have been given. In Act three the video reveals possible solutions and how to solve the problem.

Read Theory is a reading program that gives passages and questions based on the Lexile level of the child. It provides great practice but also assessment to where students are developmentally in Reading. It only allows students to work on the academic ability and above in order to expose them to high leveled text complexity.

Hands-on Equations are equations that build on each other that allow students to use real-world scenarios. They give students steps in how to solve equations by using a higher-ordered problem-solving strategy. It allows students to use critical thinking skills in looking at the why and how a problem is solved.

Genius Hour is where teachers allow students to take one hour per week and allow them to research one area in which they are passionate or interested. Then at the end of the 9 weeks students present what they have been working on in their research. Students totally immerse themselves in the research and Amy stated it was interesting for her to see how far down the rabbit hole they can get in their research. They dig deeper independently than I would have them go by giving them parameters. She said the hardest part is to teach them to not be afraid to take risks and how to wean them off of direct instruction to more of a facilitated instructional approach. They had been used to receiving direct instructions from prior years, and she had to teach them how to be more independent and take risks.

Hyperdocs is a strategy where teachers create a document with multiple assignment and links that students can choose to do. They range in different learning styles and different complexity. Students are allowed to choose the assignments to complete based on their strongest learning styles. Abby said that she had two different

Hyperdocs within her classroom—one that was easier and one that she created for her high-performing students. This allowed her to differentiate the type and complexity of activities for students to complete. The blocks in the corners are always the challenge assignments and students know they have to complete at least one of them.

Research in discovery learning is crucial in helping high-performing students to develop how to find and explore research to help them be effective problem-solvers. There are multiple ways I observed teachers doing this: through watching videos, looking for pictures, and reading content about certain problems. Many of the teachers facilitate the introduction of new material to students by allowing them to watch multiple videos or finding their own videos on a topic. Then students write in a bullet journal questions they still have, they write examples down, draw a picture of what the content represents, and then they have to create their own question. The teacher only answers questions if students are not successful; she does not want students to come to her first without trying to answer their questions independently using their device. This helps increase students' independent learning, and allows them to explore what they do not understand for mastery.

Hands-on learning allows students to be interactive in their learning through researching, watching videos, using hands-on manipulatives, and creating visual products. Abby used empty food packages to find geometric volume. In the interview she allowed last year's students, when they were discussing the formula for volume, to build a couch out of card board. Students completed the math and then worked on cutting pieces out to construct a couch. She said they failed miserably to build a sturdy couch but

I knew the kids understood the formula for volume at the end. Students were so excited about math and engaged in what they were doing they would never forget that activity. In another classroom I observed students studying Science and talking about minerals inside the earth. Abigail, the teacher, created melted minerals inside the earth using chocolate chips as the visual. The chocolate chips melted and turned into liquid lava. Then when they come out of the earth the lava turned into lava rocks.

In my attempt to describe the environmental factors that I observed I have identified multiple strategies that teachers are using in their classrooms. During the interviews, observations, and focus group responses I was able to gather data to help answer my overarching question along with the secondary questions related to my study.

Final Themes

There were several emerging themes that were identified through research. They were:

- Attributes that help define the success of high-performing students in the one-to-one classroom;

- A list of programs participants has used with students using one-to-one devices in the classroom;

- What growth strategies participants are using with high-performing students in their classrooms;

- What the learning environment looks like in a one-to-one classroom with high-performing students; and

- What differentiation is being given to high-performing students using the devices (see Table 1).

After reorganizing and analyzing data, there were several common themes that were reflected in the interviews, observations, and focus group that helped answer my overall research question and secondary questions. Throughout the research those emerging themes were:

- One-to-one devices are allowing teachers to provide differentiation and enrichment to high-performing students in the elementary classroom.

- One-to-one devices are providing students a way to use creativity and allows teachers to give students choice in how to complete assignments based on the ways in which they learn best.

- One-to-one devices are allowing teachers to give students assignments and projects that encourage student collaboration both virtual and face to face in the classroom.

- One-to-one devices are allowing teacher to better maximize students time on task.

- One-to-one devices are allowing independent learning and student reflection to occur on a daily basis through the assignments and resources created by teachers.

Differentiation and Enrichment

Educational technology allows for differentiation and enrichment by using one-to-one devices in the elementary classroom. Differentiation and Enrichment activities were

observed in every setting. One-to-one devices are allowing teachers to provide differentiation and enrichment to high performing students in the elementary classroom. There are several programs and strategies that teachers are using to help provide high-performing students with the appropriate leveled work. All of the teachers whom I interviewed and observed used their devices on a daily basis. All of the classrooms that I observed used flexible grouping, stations, and allowed students to have some choice in how they completed assignments. Most of the assignments allowed students to create and apply what they had learned to create an end product. Many of the strategies that I discuss are programs or resources that teachers use that allow students to work on activities based on their actual developmental level. Teachers are allowing discovery learning where students are unveiling what they know and do not know. Several of the strategies that I identified through my interviews and observation were Genius hour, Hyperdocs, Three Acts Math, Research in discovery learning, and hands-on learning. These strategies allow enrichment for students in how they are learning material and how they interact with other students through collaboration.

Creativity and Choice

One-to-one devices are providing students a way to use creativity and allows teachers to give students choice in how to complete assignments based on the ways in which they learn best. The interview and observations identified many strategies that have been discussed above that allow students the choice to use their creativity to show what they know on the standards being taught. Creative skills are being nurtured by allowing students to create products that they choose to create based on what they have

learned. There are multiple assignments that were observed where students could choose

how to apply the knowledge they know. Application is a great way to check for student

understanding. Through some of the interviews and observations students were being

asked to analyze and apply what they know. Abigail had her students create Google Docs

where they collaborate on questions and provide feedback to peers on their responses.

Abby has had her students create a Google spreadsheet that collects data from a science

project and then they were required to create a line graph to show the data. Abby had her

students create a rectangular prism out of cubes to show understanding of volume. Most

high-performing students can create imaginable things that the teachers never could have

imagined. April stated that she like to see students have a productive struggle, which

means that students should struggle with what they are doing to be challenged but

through the struggle they should be learning and productive to figure it out. Some of the

other resource's teachers used were Google Drawings, PowToon's, Edu creations, and

they can even use music to show what they know.

Collaboration

One-to-one devices are allowing teachers to give students assignments and

projects that encourage student collaboration both virtual and face to face in the

classroom. Student collaboration was observed in all of the classroom settings both orally

and digital. Some students were in groups working collaboratively on a project,

assignment, problem-solving, or hands-on learning activity. There were four out of those

same classrooms that were collaborating on a Google Doc or in a program called Quizlet

Live. The Goggle documents were set up with questions or problems that students were

responding to but the students also could see how their classmates were responding. The Quizlet live was an online quiz where students were in groups of three and the students had to collaborate on the answer before they all answered. If they did not all have the right answer, they lost points. High-performing students are very competitive so this was a very interesting activity to watch. The classroom environment was very collaborative and allowed students to be interactive in their learning.

Time on Task

One-to-one devices are allowing teacher to better maximize students time on task. Time on task was one of the common themes that emerged. Teachers feel like the adoption of one-to-one devices has allowed students to have more time on task in the classroom. When students finish there is always something for them to do, teachers have their Google classrooms set up for students with extra enrichment for students who finish early. In the focus group session participants discussed how their resources and materials that students were using were all on their Google Classroom so there is less time wasted on collecting materials in between transitions. Amy stated it makes her have to plan more because she is constantly posting new things and updating their work. Abby stated that she is working harder than she ever has in keeping up with all of the resources from which she is allowing students to choose. She stated, "if students are going to have that much control then I have to be organized." Students enjoy having choice in how they complete assignments and how they master the content. The increase in time on task is great for students who work faster. Students learn to be in control of their own learning, this is an invaluable skill that will help them remain successful. Independent learning is

very important as they get older. As independent learners it is also important to self-reflect.

Independent Learning and Reflection

One-to-one devices are allowing independent learning and student reflection to occur on a daily basis through the assignments and resources created by teachers. Multiple teachers who participated in this study felt independent learning and reflection are crucial for high-performing students to develop. Before digital devices most of my participants felt that acceleration was much harder to assign to their high-performing students due to the requirement to plan and provide resources to grade level requirements. Now that teachers have all of the resources at their fingertips, they felt that any subject could be found in videos, assignments, and resources that they could give to students in order to keep them accelerating. Many times, they will also allow students to complete research on their own which allows students to go as deep as they want on a subject. Many high-performing students work well independently to explore subjects they are passionate about, which puts them in the driver seat of their own learning. So many of the assignments given to students offer a variety of choices in creating a product. Based on how they learn those products might include anything from pictures, to research, to drawings, to video, to a typed product. The Flipped Classroom approach offers an opportunity for the learning to be in the hands of students. Abby's classroom was a perfect example of the flipped classroom approach. In the interview she referred that students should be in the driver's seat to guide their own learning and that she was the facilitator who helped them find their way. Several participants stated in the interviews

and during the focus group that the teacher has to become the facilitator of learning, which takes the focus off of the teacher and put it into the hands of the high-performing students. Amy stated that the flipped classroom approach gets them engaged in their own learning.

Developing strategies that guide students to develop independent learning skills will help them find their own answers with resources. Independent learning is an important skill for students to develop. Most all of the participants were not worried about their high-performing students not being able to complete an independent task. Reflection is a great strategy for growth. If we can train students to reflect on their work and problem-solve to figure out what they got wrong they will be able to master content. Amy stated in the interview, "I'd let them try first, but I think for them to be able to actually look at the project and do it on their own without a lot of teacher guidance I think is really good for them to struggle, and then come back and talk about it." If students can learn through their mistakes to grow then they will be able to continue to reflect on their strengths and weaknesses. A digital environment allows students to actively be involved in online discussions with their teacher and classmates to receive feedback.

In Observation 6 with Abigail's students they used a Google document to collaboratively give each other feedback on a discussion based on their reading assignment. All of the teachers walked around their classrooms to facilitate the different groups of students. Some teachers used live data feeds to check student progress and reteach a skill with which students struggled. Instant feedback is one area teachers stated has improved by having one-to-one devices in the classroom. Teachers can now track

student weaknesses and redirect their mistakes instead of waiting until the next day to address incorrect problems.

Utilizing one-to-one devices in the classroom on a daily basis, teachers are trying to encourage students to take ownership of their own learning and choose ways they learn best to complete assignments. This flexibility allows students choice and preference when choosing how to master content. As students dig deeper into content and explore it in ways that make sense to them it is vital that they self-reflect to be sure they are mastering the content. If students are taught how to reflect and grow for their failures then their academic growth will happen. In the interviews another common theme that emerged was personal growth which included terms like failure, mistakes, productive struggle, and challenge. All of these terms are important for students in order to give them a challenge and make them individually grow. If students are able to identify their weakness and work on that weakness, then that is part of growth. Several of the activities that these six teachers are allowing students to do is to learn about areas in which they are weak and how to improve in these areas.

Summary

I would like for educators to learn new instructional strategies from this research that they can use in a digital environment. It is vital that we as educators use technological resources to help maximize our instructional time and allow it to become a resource for both us and our students in the daily classroom environment. Researchers have identified the need to provide differentiation and enrichment for high-performing students. "Challenge is difficult to experience in a system that promotes grade-level

standards and group assessment of these standards" (Gentry, 2006, p. 78). I discussed in

Chapter I that due to many state performance expectations that proficiency, which means

the child scores a Level 3 or higher on their EOG, is thought to be on grade level. Due to

this expectation, many teachers do not focus on the growth of all students in the

classroom. If those students are proficient both parents and the teacher tend to think the

student is okay. Just because the student has passed by state measures does not mean that

student has demonstrated growth for the academic year. Therefore, I was particularly

interested in looking at how we can use digital devices to create enrichment, provide

differentiation, increase higher-order thinking skills, and develop critical thinking skills

for our high-performing students to continue their educational growth. As you have read

the devices are providing rich environments that are developmentally appropriate for all

of the diverse group of learners. Through the rich opportunities students are getting from

their teachers they are utilizing higher-order and critical thinking skills in their daily

choices on how to complete assignments. There has never been a time in history where

there are limitless resources and content available on a daily basis. It really all comes

down to how flexible the teacher is in allowing students to dig as deep as their mind

allows on a topic. So to me the most successful strategy we can use with students in

today's classroom is not to teach just Common Core standards but to teach our children

how to be self-motivated learners who are thirsty for as much knowledge as they can

absorb. The main themes that were discussed in this chapter were:

- One-to-one devices are allowing teachers to provide differentiation and
  enrichment to high-performing students in the elementary classroom;

- One-to-one devices are providing students a way to use creativity and allows teachers to give students choice in how to complete assignments based on the ways in which they learn best;

- One-to-one devices are allowing teachers to give students assignments and projects that encourage student collaboration both virtual and face-to-face in the classroom;

- One-to-one devices are allowing teacher to better maximize students time on task; and

- One-to-one devices are allowing independent learning and student reflection to occur on a daily basis through the assignments and resources created by teachers.

CHAPTER V

DISCUSSION, CONCLUSIONS, AND IMPLICATIONS

In my current role as a principal I have found that it is difficult for teachers to assign activities to high-performing students to keep them engaged and growing academically. In order to gain a deeper understanding of the ways in which teachers are using one-to-one devices, I conducted a qualitative study collecting data through audiotaped interviews of six teachers who volunteered to be part of my study. I conducted six observations in those six teachers' classrooms. Then I had a follow-up focus group session with five out of six teachers. I interviewed teachers from three different elementary schools within the same district. I coded data gathered from the interviews, observations, and focus group responses in order to identify themes and answer the research questions. I identified that teachers who are making growth with students are using the devices to help provide differentiation and enrichment to students in order to improve learning for these students. The main overarching themes that emerged in my research were:

- One-to-one devices are allowing teachers to provide differentiation and enrichment to high-performing students in the elementary classroom;
- One-to-one devices are providing students a way to use creativity and allows teachers to give students choice in how to complete assignments based on the ways in which they learn best;

- One-to-one devices are allowing teachers to give students assignments and projects that encourage student collaboration both virtual and face to face in the classroom;

- One-to-one devices are allowing teacher to better maximize students time on task; and

- One-to-one devices are allowing independent learning and student reflection to occur on a daily basis through the assignments and resources created by teachers.

Through this study I wanted to help teachers learn through my research by providing them with examples of best practices used by teachers who are showing growth with high-performing students. I wanted them to see how technology can be used in the classroom to give them a platform for building complex, high order thinking assignments and projects that help their high-performing students grow through the enrichment activities that are provided to them.

Lei and Zhao (2008) stated in their research that when it comes to the question of what really happens when every child has a laptop and how the laptops are being used in the classrooms, current studies provide only general information on "what" is used, "how much" is used, and the changes in "what" and "how much," but not much information on "how" the laptops are being used in teaching and learning practices (Lei & Zhao, 2008, p. 98). My study involved examining how teachers use the one-to-one devices in their classrooms to improve learning for high-performing students in the elementary classroom.

The goal of my study was to identify several strategies and approaches teachers are using with the devices to assign students. I found that the teachers who participated in my study were using the one-to-one devices to provide differentiated instruction to their high-performing students through multiple resources and venues using the devices. I have found that some teachers are using their devices to provide differentiated assignments to students on a daily basis since the adoption of one-to-one devices. This allows students to be working on their appropriate academic level and to use their device as an endless resource of knowledge. One of my participants stated that it is not just what the teacher knows that is providing instruction on a subject now, but the knowledge is limitless due to the students having devices. This is a huge advantage for those students who need to go deeper into the content; they have endless resources and videos that can take them to the level they need. Before technology, the teacher could only provide so much enrichment and differentiation to students due to time and resource constraints. The adoption of one-to-one devices in the classroom has opened up a door for teachers to not only manage time more efficiently in keeping all students engaged, but it has also allowed teachers to give assignments to students based on their learning needs. In this chapter, I offer conclusions, implications, and recommendations based on what I have learned through the research of this study.

Research Questions

This study was conducted to answer the question: *How do elementary teachers who successfully promote growth in high-performing learners use digital devices to improve learning for these students?* This question is very complex and has multiple

areas I will discuss in the discussion of my study. The teachers who volunteered to participate had been identified through EVAAS data that they were showing positive growth with their Level 4 and 5 students on the End of Grade assessment. This group I had identified as high-performing students. These high-performing students are being allowed to grow and move through curriculum by digging deeper into the content or accelerating to high grade level content through their daily work.

There were several secondary questions that were important to study as well in order to truly answer the overarching question. In order to answer the primary question, it is important to first explain the findings related to the secondary questions.

- ***What strategies that utilize digital devices do elementary teachers use to improve learning of academic content knowledge for high-performing students?***

In order for this study to be beneficial, it was important to identify teachers who were having success with getting high-performing students to grow. When looking at the success of high-performing students I think you have to look at what characteristics make this group of students successful in the classroom. Not all teachers have success in growing this group of students. This group of students can be very challenging to provide adequate instruction for that keeps them actively engaged. Applying content in ways that differentiates for students help students by allowing them to learn in the way in which they need to grow. In the Kim et al. (2017) study on program development for high-ability students:

According to their suggestions, curriculum for high-ability students should be research based, providing scaffolding through questioning and thinking models, acceleration with support, and opportunities for real-world projects and problem solving. (p. 93)

Devices offer endless possibilities and content that students can utilize to complete assignments. Throughout the research each teacher utilized devices to help provide opportunities through the assignments given to high-performing students that allow students to use the devices to research topics they are discussing in class. Addie stated in her interview that the possibilities for research and resources are limitless with students having their own device. She stated that when she first started teaching to conduct research, she had to spend time pulling books and resources for students to use; now it is at the touch of their fingertips. This has allowed them to be able to allow students the opportunity to learn and grown as much as they can, where years ago, before devices, she had to just let them work on grade level content. Amy discussed how much she enjoyed allowing students to use Genius Hour which is an opportunity for students to take time out of class to research what they are passionate about. She stated that she is always amazed at how far students go in their research, they really go deeper into the topic on their own than I would have taken them in class. There are many resources online that students are using now with devices that already place them on the academic level in which they are performing; this allows them to go on and for them to receive the differentiation they need to grow.

The learning environment that I observed was amazing; it allowed engaging assignments that got students engaged in being independent learners. If students can learn

independently, they can continue their learning after school hours and in life. Students were excited about the projects and assignments that they were working on. I stated before that the classes when working in stations were loud but they were all very productive, which was exciting to see as a principal. The amount of flexibility and choice was amazing but requires the teachers to be very organized and it also requires them to facilitate closely by monitoring what all of the students are doing since they are all working on different assignments.

Collaboration

All students were very engaged in what they were working on and seemed eager to complete their work. They had questions and great collaboration with other students. They asked questions to their peers and sometimes the teachers, but most often the peers could answer their questions. Due to all of the discussion and collaboration the classroom was loud but not disruptive. The voices were very productive in the learning that was going on in the classroom environment.

There are daily opportunities for students to work together online and off line. When students work online Addie stated they can be talking with the person next to them or someone in another classroom across the hall. That is the awesome thing about the silent discussions that we do, at the end of the day there may be 30 comments or resources there that students can use for reference. Amelia discussed that there are School Net tests that she uses that allow teachers to monitor a live data feed, it allows me to see what students need extra help. As a principal I want my teachers to constantly be monitoring students and using some sort of check for understanding that let them know

what students are struggling with. How amazing it is that they can address those weaknesses within the class period instead of having to wait until an assignment is graded and then trying to provide interventions. "Asynchronous online discussions are tools that teachers can use to make expert processes more visible and that can help them model, scaffold, provide feedback, and generally support student learning" (Boling & Beatty, 2010, p. 48). Multiple teachers are using Google Documents where both students and teacher feedback is being given on answers. Collaboration with peers in today's world is essential. In the Battro study discussed in Chapter II, "Teaching and learning are now expanding because of vertical and horizontal interactions in real pedagogical situations in a digital environment: children to adults, adults to children, and children to children" (Battro, 2013, p. 134).

Real-world Problem-solving

Amy discussed how much the students learned from each other when they work on projects as a group. She discussed that they all have different learning styles and different ideas so when you put them together, they can come up with ideas they may not have thought of working on their own. Abby discussed in her interview that she felt the students should be working on content that is related to real-world problems, like the Three Acts Math that I got to observe. The kids were so excited and you could hear their discussion of what they had discovered in the first act and what still was needed to solve the problem. They were so engaged in wanting to solve the problem. Another great example was with Amy; she had a very advanced student who stuck out in her memory several years ago who finished everything she gave to him and then was bored. So, she

came up with a real-world project for him to conduct research, she had received a Farm Bureau landscaping grant, so she had him create dimensions, come up with how much dirt they would need to create a bed, what plants would grow good in the area. Do these plants grow in the type of light? Where can I find these plants and how many can I buy? She had him create a proposal to submit for his assignment and then made a perfect score on the EOG. She talked about how engaged he was to carry out the task.

- ***How do elementary teachers enrich curriculum and instruction for high-performing students by using digital devices?***

Differentiation and Enrichment

Differentiation is crucial in today's classroom environment; if we are not teaching students where they are then those students will not grow. "Differentiating instruction makes sense because it offers different paths to understanding content, process, and products, considering what is appropriate given a child's profile of strengths, interests, and styles" (Dixon et al., 2014, p. 111). Dixon et al. (2014) identified that differentiation offers paths to understanding by allowing students to pull from their strengths and interests. The teachers in this study are allowing students flexibility and choice by allowing students to select how they will learn the content. I observed different instructional approaches, different assignments, assignments that focused on different learning styles, different ways to receive content, different ways for students to submit what they know, and differences in how they assess students on what they know. Some of the different ways they are allowing this is by videos, choice boards, Hyperdocs, Google classroom, and exploratory learning activities. In most of the classrooms I observed

students were given choice in how they would create answers or how they would relate what they know to the teacher. They could pull from their strengths in deciding how to complete assignments through deciding how to best learn the content, but also by the way in which they choose to show teachers what they know. The teachers in my study are allowing different delivery options, different activity options, and different ways for students to analyze the content and apply it by using the devices with high-performing students.

Enrichment

Enrichment is improving the quality of instruction; high-performing students need instruction that help them grow academically. In Chapter II, I stated that the new goal for schools should be to create a total enrichment program that focuses on making schools places that develop the talents and abilities of all students in an inclusive environment through the differentiation and enrichment provided to them by leveraging digital devices. In the focus groups, Annie stated that with devices students were getting enrichment daily, whereas she used to take time each week to provide enrichment activities for the high-performing group of students in her class. In order for students to receive daily enrichment through the activities assigned to them by using the device, teachers must have adequate training in how to differentiate and they also need training on how to use the devices to help provide this quality instruction. The types of activities that are assigned to students using the devices should be on a high-ordered thinking spectrum; they should be rigorous and challenge students to think. I love the words productive struggle that Amy used when she stated, "I like—success in the classroom

looks like a productive struggle, and that productive struggle is going to lead to self-discovery." High-performing students who are struggling a little means the task is developmentally challenging them but it allows them to work harder to find success. The assignments teachers are assigning students are very rich in content, but they are also rich in the amount of thinking it requires students to do in order to create a product to show what they know. There are so many creative ways that students can use to show the teachers their mastery of the content.

- ***How do elementary teachers improve high-performing students' learning of higher-order thinking skills?***

Higher-order thinking skills are developed over time through the activities and strategies that we use with students in the classroom. In this study teachers are using different resources and strategies with students to help develop these skills in creating products and solving real-world problems. They are allowing them to self-reflect and analyze their own strengths and weaknesses. Students are being allowed to make choices and focus on how they learn content best. They are able to use their strengths to show what they know by using devices to research and create digital products. The devices have allowed students to create products that apply what they have learned. Amy stated in class her students are able to "make things and design things, create things, and they can share them collaboratively." Amy stated that everything they do in class requires "communication, the evidence of reasoning, the critiquing of others, the use of patterning and structure and sequencing, the discussion of asking questions." Therefore, students are

receiving multiple opportunities to develop higher-order thinking through the use of devices in the elementary classroom.

Independent Learning and Reflection

"When viewed from this perspective, it is an accepted fact that there is a need for a more modern and effective learning-teaching method that assigns responsibility to the student, that encourages individual learning, that makes the teacher more of a guide than a leader" (Sezer, 2017, p. 473). Environment is crucial for high-performing students; it should be an environment that teaches problem-solving and allows students choices in utilizing their creativity. "The contemporary classroom is open (as opposed to closed), global (as opposed to local), and connected (as opposed to isolated)" (Aagaard, 2017, p. 1128). The impact of technology depends largely on how the teachers are changing their teaching strategies, assignments they are assigning students through the use of devices, and the type of learning environment in the classroom. Higher-order thinking skills are being developed through the types of activities that are being assigned to students. In Chapter II we discussed that due to so many ability levels being in one classroom, teachers sometimes struggle with how to manage providing instruction to each student on her/his level of learning. Mulrine (2007) states that teachers have to find creative ways to stimulate thinking and to create higher-order thinking opportunities for all students. In this study, the teachers who participated were facilitating these opportunities for stimulated thinking. Four of the teachers felt very strongly that the kids need to be in the driver's seat of their own learning and that they were the facilitators. They facilitate by creating options and opportunities for students to research, explore, question, discuss, and

analyze content to learn. In using a flipped classroom approach by leveraging technology,

Siegle (2013) finds that students are able to access more advanced content online,

develop contexts for application and critical thinking skills, access tools for constructing

and collaborating with others using their skills, while supporting the exploration of

abstract concepts in their application of classroom content. After students learn the

content, they are then given opportunities to apply the content in a creative way that

engages them into application and creation of a product to show the teacher what they

know.

- ***How do elementary teachers improve high-performing students' learning of critical thinking skills?***

Critical Thinking

Critical thinking skills are being developed by allowing students to discover how

to solve real-world problems and learn from their mistakes through true reflection. In

Chapter II, Matusevich et al. (2009) state,

> In these rigorous learning environments, students accept greater responsibility for developing and applying a deep understanding of significant concepts, generalizations, essential questions, and skills and procedures to problem finding and problem solving for which there are no predetermined limits. (p. 47)

When students accept a greater responsibility, they are able to apply a deeper

understanding of the concept. Abby stated, "the whole world's open, so it's like when

you get done, that's the whole smart choice thing, like you don't have to stop learning,

and it's not like a—I get a break, it should be—I'm, you know, it can allow the kids to

continue to accelerate." Instead of down time in the classroom after all their work has

been completed, students are encouraged to continue working on skills or assignments that help them grow. Oftentimes these smart choices are on the computer, it may be an assignment in Google Classroom that a teacher has posted it may be extra research on the topic of choice, or it may be on a specific program that is assigning tasks on their academic level. There are so many different ways and options to assign content to high-performing students in a classroom that has one-to-one devices.

- ***How do elementary teachers improve high-performing students' learning of creative skills?***

Creativity and Choice

The environment in which students learn is key to student success. The environment is created by the way in which a teacher cultivates learning for students. It is set by the structure and processes the teacher uses to deliver content. The six different environments that I observed during this study were very flexible, they offered students choices, they were stimulating and engaging, and they were loud. The teachers were very open to allowing multiple activities or centers to be going on simultaneously which made it loud but productive. Every classroom involved students working on different tasks. If a group needed to be redirected or a resource needed to be changed the teacher was very flexible in regrouping students or giving alternatives to problem-solve. All of the classrooms that I observed offered students choices in what videos they watched to take notes, to how they take those notes with pictures or words, to the assignments they complete and how they complete them. The teachers feel like if students have choices

they buy into their education more and they are more eager to complete the tasks and be engaged.

In the Miller and Gentry (2010) study, teachers indicated that providing students with choice, finding what the students' interests were, and using advanced content that allowed hands-on activities improved student motivation to learn. When students have choice, they are more engaged and accept a bigger responsibility in their own learning. When students are engaged and motivated to learn their creative skills emerge in their ideas of the product they create. Through my research I found multiple situations that allowed students to choose how they present material to show what they know. This choice alone allowed students to be able to use their creativity and pull from their strengths. There were multiple occasions that I talked about in my findings when Annie stated that when she created a concept map of five bubbles for students to fill out limited how deep they went, whereas when she allowed students to create their own, they created 30 bubbles with deeper content. Abbie stated in the focus group discussion, "the less I do and the more I have them create, the more they hang on to." Have them create and then share out, they love to do this. Amy stated in the focus group session that teachable moments are great when you have one-to-one devices; they allow you to go deeper with a topic in discussion. The devices have definitely made it easier for students to use and build their creativity in the everyday classroom which will help them grow in their critical thinking.

Implications

This study has many implications about how elementary teachers are utilizing devices in the classroom with high-performing students to provide differentiation and enrichment activities. Through the interviews the six teachers identified multiple ways they are using devices daily to help provide the type of learning environment needed by high-performing students. They all have somewhat of a different philosophy on how students learn best, but all of them feel that the one-to-one devices have made a huge impact on how they teach. They feel that the devices have allowed them to be able to teach to all of the students in their classroom and not just teach to the middle. The participants in my study have all been teaching long enough to identify the difference in their classroom before devices and then now with devices. This evolving change could be considered a paradigm shift.

Paradigm Shift

Technology and the adoption of one-to-one has created a paradigm shift in the way today's classroom is organized. During my follow-up interview I asked the question, "How has your teaching or classroom changed since the adoption of one-to-one?" The teachers all stated that it had changed drastically. Most of them felt that having devices for every student on a daily basis has opened up endless teaching and possibilities for student learning. All of the teachers felt that technology had allowed them to utilize their time more efficiently. They also felt that their teaching had shifted from what they were able to provide as far as their knowledge to the endless amount of knowledge that has been extended to high-performing students by the devices. The devices have allowed

students to have a limitless wealth of knowledge that was very limited on projects and library resources before technology. Today's classroom is a changing environment; teachers feel that it is very hard to plan because Amelia stated, "you just do not know how far they are going to get in their learning on that topic that day." She stated, "I find myself planning, and re-planning daily to keep up with where they need to go." Abby stated, "the kids can do more work daily than I can keep up with when using device."

April stated that during her career as a teacher she feels like she has come full circle from using collaboration and paideia type teaching, to more drill type teaching, to now back to more of a collaborative approach. In education we have gone through so many shifts in what strategies or best practices we feel are the perfect learning environment. I think the technology age that we live in now makes it very hard for the teacher to be the most intelligent and well-versed on the subject being taught in today's classroom environment. I found one of the most interesting comments made in my focus group session was a statement made by Abby; she said, "the kids are no longer limited to the knowledge I know, they are not held back by my limitations," whereas before technology the kids could only learn from the knowledge the teacher could give them. Now the devices and the world wide web have extended that to endless knowledge; students can research as deep as they want to and learn as much as they can. Therefore, the shift has moved the teacher as the giver of knowledge to the facilitator of knowledge. Facilitating students is what all of the teachers I interviewed and observed. None of them stood in front of their class and lectured, and none of them had students doing the exact

same thing. They have worked to create a classroom environment that facilitates learning opportunities using devices.

High-performing students are allowed in most situations to have choice, flexibility, and be in control of what they learn and how deep they explore it. All of the participants felt very strongly that they wanted students to take control of their own learning and take ownership of it. When students do this, they are developing skills they will use their whole life; when students apply and create a product they will learn the material. One of the ways they facilitated learning was to use a Hyperdoc. This strategy emerged in the research multiple times; it allows a way for teachers to list multiple videos, assignment links, and resources through the use of a one-page digital document that houses links within the page. This strategy is being used by both Amy and Abby to give their students choice and offer a way to differentiate the content they are teaching. Students can go to this page on Google Classroom and move up to 10 different ways in their assignments and daily activities. I observed students moving from videos, to assignments, to assessments, to hands-on project directions, to practice sites. The possibilities are endless.

Students who use devices daily are very engaged with what they are doing. In every observation that I conducted student engagement was extremely high. There were many assignments and activities observed that required students to work in groups to collaborate. Some assignments allowed students to collaborate out loud in the classroom and some of the assignments had students collaborate silently using a Google Document. Students were excited about completing the tasks and discussing their ideas with

classmates. I observed students positively encouraging other students and serving as a peer coach to help other students understand the content. I really enjoyed watching the students work on assignments that allowed them to collaborate and share ideas. I enjoyed watching the teachers facilitate discussion and provide instant feedback to students who were not mastering the content. I watched two teachers using live data on their laptop two different ways to pull kids and reteach a concept. One class was math; the teacher was monitoring students taking a School net quiz, and she called small groups back to reteach or help students who were struggling on the quiz items. It is very powerful to be able to reteach items missed by looking at real-time data to address students' issues in that class period, instead of the teacher the test home to grade, and maybe the following day reteaching that skill if time permitted. I also observed a teacher using Google documents to allow students to have a silent conversation in which students were supposed to respond to a question based on their reading passage. Then students had to comment on other students' answers and give them feedback. The teacher was working with a small group on another assignment and she was also monitoring the online discussion. She would give feedback out loud or enter her own comments onto the Google Document. I enjoyed watching teachers learn alongside their students as the teachers allowed students to use their own ways to solve math problems, in ways in which the teacher had not thought.

This is the shift I want to see in my school. As administrators we should want all students to grow, even the high-performing students. The accountability system is predominantly set up to focus on proficiency, but should not the predominant feature be

set to focus on growth? Proficiency does not support growth for all of our students, especially our high-performing students. In today's classroom we have students who are well above their grade level on their academic performance; are we hindering those students and causing them to regress? Or are we providing them with the enrichment and differentiation that they need to excel and continue growing in their academic abilities? I have concluded through this research study that one-to-one devices serve as a great way to provide the resources for teachers to use to provide enrichment and differentiation that allows high-performing students to go on to the level in which they need instruction to ensure they continue growing in their academic ability.

Professional Development

Teachers who participated in this study felt that professional development was very important and thought that it needs to be specific to the individual. In the focus group session teachers felt that conferences like NCTIES and local technology conferences have been very helpful to them as they learn how to better use their devices. They also loved something they had participated in called Ed Camp; this is where a large group of teachers attend a professional development session where the topics are decided on after teachers arrive. Teachers get to list their top three choices for professional development and then they vote on them. Those topics are the ones that are the focus of the meeting. Teachers get together in groups and discuss the topic by talking about how they use it in their classroom and they collaborate on ideas concerning the topic. Participant 1 stated that she felt like professional development really has to be a choice— you have some teachers who are far along in what they are using and others who are way

behind. "I do not want to sit there and listen to something I already know how to do; my time is important." I feel like this is key to professional development; as a principal I see teachers on both spectrums—some who need PD from the beginning on the basic use of the devices and implementation of the devices and others are the leaders in technology in their classrooms. As leaders how do we differentiate PD for our teachers? This is going to be critical as we continue this journey in utilizing one-to-one devices in the classroom. "Ultimately, a piece of technology is a resource and how that technology is embraced and utilized by the teachers themselves is the ultimate variable of success" (Sutton, 2015, para. 9). The way in which a teacher utilizes technology in the classroom affects the variable of success. The six teachers I identified demonstrated making growth with the high-performing students on assessments. Therefore, since the students have shown growth, what they are doing in the classroom is part of that growth. Through the research I have identified multiple ways they are using technology with high-performing students, but there are common themes that have emerged concluding that technology has not made students grow but the ways in which teachers are using the technology has created a paradigm shift in the way they are teaching that allows high-performing students to grow.

Barriers and Challenges

I think there are several barriers and challenges that schools and districts face when adopting one-to-one devices, such as lack of training and professional development on how to use devices to engage students in higher-ordered activities and critical thinking. Most of the time there is a large amount of time and effort required by teachers

for real integration and high-order activities. This requires teachers to explore and find the resources, set them up for their students to use, and then have options for students to choose from, so they need to be familiar with how each resource works. They need to be ready at all times to help facilitate students who are having issues. Another common challenge for schools that have adopted one-to-one are issues with devices that are broken or need repairs. It is hard to create assignments that rely solely on technology when the devices are not dependable. Since devices are in the hands of students they are often broken or require repairs. Sometimes this can take several weeks and unless the school has back up computers this is a barrier for teachers in the classroom. Another concern that I discussed in Chapter II that came out of my research is the concern that some professionals have is that students are getting too much screen time and how it could be affecting their development. Devices are so common now that most students have exposure from a very young age and the average person spends many hours a day on a device. The Cavanaugh et al. (2016) study discussed in Chapter I regarding intensive use of digital devices suggests that certain "cognitive skills are gained through the use of devices but that other 'deep thinking' capabilities atrophy as a result of alterations in the neural circuitry of the millennial brain" (p. 374). There is great concern that students have too much screen time, and the after effects that it may cause them in the future as adults. Growing up in a digital environment where everything can be accessed at any time and how to handle that may be hurting students' deep-thinking capabilities is a concern.

Next Steps and Future Research

There were many ways identified in this study that teachers are using the devices to provide differentiation and enrichment for high-performing students. There are very few studies on how devices are being used in the classroom. Now that many districts have adopted one-to-one devices in many of their schools it is important to be sure these expensive investments are being used in ways that provide returns to the investment that has been made. There are many different components that affect the way technology is used in the classroom with students. A large factor is the teacher and how willing they are to continuously learn about new resources that keep them on the cutting edge of technology. In my study during the focus groups conversation, the teachers who participated stated that using the devices was a lot more work. Abbigail stated that if I am going to give students the power to choose what they do to learn a topic then I have to be very organized. By giving students choices you may have to prepare one lesson five different ways. So, the work is harder on me but worth the outcome. In the future I hope there is more research on how the devices are being used with not just high-performing kids but all of the different groups we serve that have special learning needs. I think that some of the most beneficial professional development that teachers can have are the sessions where they learn best practices from other teachers. I think another area of research that will be important in the future is to look at the affects that the digital age has had on students as far as their social skills, mental abilities, and emotional health. Through my research this came up in my focus group session about the need that students have to be on a device, one participant stated that it was almost like an addiction. In

Chapter II, I discussed that technology is a way of life for our students most have a device in their hand by age two and the average person spends the majority of their day on a device now that mobile devices are so common. The teachers discussed the need to have a mix of activities throughout the week some that required devices and others that allowed students to take a break from screen time. They discussed how much more the devices have allowed them to do with students but several of them were concerned about how it was changing the way students work.

Conceptual Framework

The conceptual framework that I used for this study considered critical components for both technology and differentiated learning. The Renzulli (2010) model (see Figure 2) involves a triad that uses three types of instruction to provide enrichment to students in the regular general classroom setting—group, individual, and small group. In order to effectively identify differentiation and enrichment with high-performing students it is important to look at the Enrichment Triad Model, developed by Renzulli, which is comprised of three phases in the regular classroom environment: exposure/ exploration on the topic, whole group skill and process development, and small group investigations of the real problem or task which is achieved through investigation and creating a product by application of understanding content. Type I is exploratory activities; there were several activities that allowed students to explore ideas and possible questions they had, like Three Acts Math or Hyper Docs.
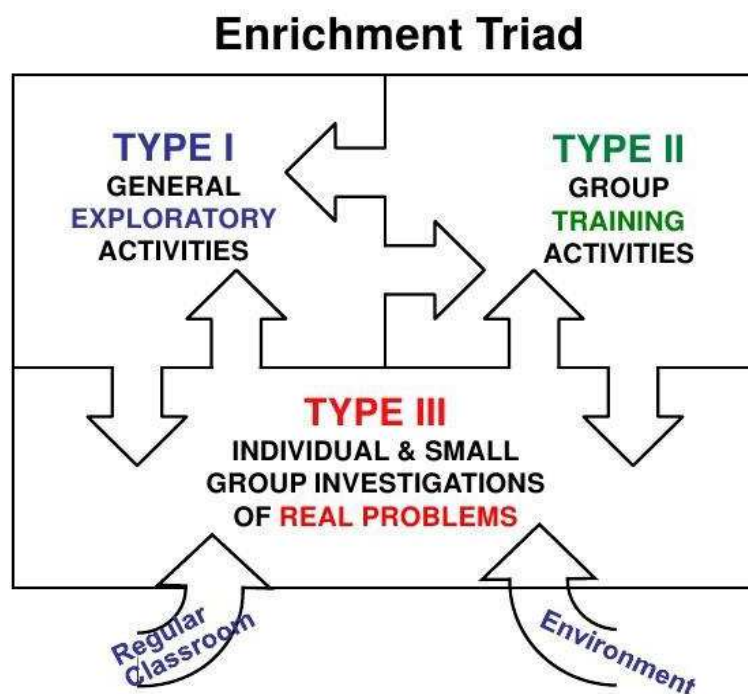
Figure 2. Review of Renzulli's Enrichment Triad Model. Source: Renzulli, J. S., & Renzulli, S. R. (2010). The Schoolwide Enrichment Model: A focus on student strengths and interests. *Gifted Educational International, 26*(2-3), 140–157. doi:10.1177/026142941002600303

In the Enrichment Triad model, the model that was used for the conceptual framework of this study, type II enrichment includes group instructional methods designed to promote development of thinking (this is the development of creative thinking, problem-solving, critical thinking, how-to skills, and great communication skills; Renzulli & Renzulli, 2010). Enrichment happens in type III through the activities students are given to do individually or in small group projects. In type I students explore a topic to learn about, then in type II the teacher acts as facilitator to provide whole group instruction and training. Then type III is where students apply what they have learned through individual choice or small group projects. By assigning students activities that

give them choice, students but into their own learning and take a responsibility for their

own mastery. Students are allowed to make mistakes and learn by those mistakes. As

discussed in Chapter II, Hertzog (2017) found that

> In these rich learning environments, students share their strengths and collaborate
> with others to extend and challenge their thinking. Creativity is greatly enhanced
> because students have opportunities to engage with multimedia materials and
> technology to represent their ideas. (p. 220)

Students are using devices to follow this model of enrichment, they are able to engage

with multimedia resources and materials, and they are able to use technology to create

products that represent their ideas. Throughout the research the teacher participants were

serving as the facilitator identified in type III of the model. Teachers are given tasks to do

either on an individual basis or in small groups. Students are required to apply what they

have learned through a project or assignment that required application. All of the

classrooms I observed offered students many choices in how they found the content and

how they applied the content they are learning. In all of the classrooms, students could

use their creativity and not be fearful of mistakes. The students I observed were receiving

enrichment activities that are identified in Renzulli's enrichment triad model.

Conclusion

Throughout this study I have identified multiple strategies, assignments,

resources, and common environmental factors that the six teacher participants are

utilizing in their classrooms on a daily basis with one-to-one devices. Students are very

engaged and were all working on assignments during the observations. The teachers'

responses to the interview questions and focus group questions were very student-focused

and identified multiple ways they are working to attain student growth in their high-performing students. You can see through the data that these students are working to develop their individual learning levels through critical thinking and activities that offer them the rigor they need to grow. Throughout this study I have been able to draw several conclusions. The most common themes that emerged were differentiation and enrichment, collaboration, time on task, independent learning and reflection, and strategies that allow creativity. I wanted to look at how teachers are using these devices to teach high-performing students. All of the teachers who participated in my study were identified as showing growth with high-performing students, they had one-to-one devices for three full years or more, and were in elementary. Teachers are using these devices on a daily basis with students. On-to-one integration is not a new initiative and there is much research on implementation. I think we have seen a paradigm shift from teacher use to student use of technology. Technology has become important to teachers in helping provide leveled instruction to students in the classroom.

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APPENDIX A

RECRUITMENT LETTER

Recruitment Letter

Dear [Insert Name],

My name is Christie Abernathy, and I am a doctoral student from the Educational Leadership and Cultural Foundations Department at the University of North Carolina at Greensboro. I am writing to invite you to participate in my research study about how elementary teachers leverage one-to-one devices in their classrooms to provide enrichment and differentiation to high-performing students. This study is a qualitative study about how teachers are using devices to help their high-performing students grow. You are eligible to be in this study because your students have used one-to-one devices for over a year, and you have shown growth with your high-performing students.

Participation in this study would involve two one- hour observations of your classroom, one face- to- face interviews with me that would be 45-60 minutes in length, and participation in a focus group for about 60 minutes. I would like to audio record your interviews and will then use the information to assist me in identifying best practices and strategies on how devices are being used in the elementary classroom to help provide high-performing students with enrichment activities and differentiation. The audiotaped interview would be kept confidential and would only be shared with the transcription service provider contracted to transcribe the interviews from this study, and that person will sign a confidentiality commitment.

Remember, this is completely voluntary. You can choose to be part of this study or not. If you would like to participate in this study or have any questions, please email me at c_aberna@uncg.edu. Thank you very much for your time and consideration.

Sincerely,

Christie Abernathy

c_aberna@uncg.edu

828-430-0995

APPENDIX B

CONSENT TO ACT AS A HUMAN PARTICIPANT

UNIVERSITY OF NORTH CAROLINA AT GREENSBORO
Adult Consent Form
CONSENT TO ACT AS A HUMAN PARTICIPANT

Project Title: <u>The Use of Devices in Elementary with High-Performing Students</u>

Principal Investigator and Faculty Advisor (if applicable): <u>Christie Abernathy PI/ Dr.</u>
<u>Carl Lashley (FA)</u>

Participant's Name: _____

What are some general things you should know about research studies?
You are being asked to take part in a research study. Your participation in the study is
voluntary. You may choose not to join, or you may withdraw your consent to be in the
study, for any reason, without penalty.

Research studies are designed to obtain new knowledge. This new information may help
people in the future. There may not be any direct benefit to you for being in the research
study. There also may be risks to being in research studies. If you choose not to be in the
study or leave the study before it is done, it will not affect your relationship with the
researcher or the University of North Carolina at Greensboro.

Details about this study are discussed in this consent form. It is important that you
understand this information so that you can make an informed choice about being in this
research study.

You will be given a copy of this consent form. If you have any questions about this study
at any time, you should ask the researchers named in this consent form. Their contact
information is below.

What is the study about?
This is a research project. Your participation is voluntary. This is a qualitative study
about how elementary teachers leverage one-to-one devices with high-performing
students to provide differentiation and enrichment in the classroom.

Why are you asking me?
You are being asked to participate in this study because you teach in grades 3-5, your
students have used one-to-one devices for at least a year and you have shown growth
with your high-performing students on their EOG growth.

What will you ask me to do if I agree to be in the study?

As a participant in this study you will be asked to allow two one-hour observations of your class, one 45 minutes to one-hour interviews conducted by the Principal Investigator, and participate in a focus group lasting approximately one hour. The interviews and focus group will be audiotaped. You will be asked to share any feedback, or strategies that you use in the classroom to leverage devices to differentiate or provide enrichment activities for your high-performing students projected to score a level four or five on their End of Grade assessment.

Is there any audio/video recording?
The individual interviews and the focus group will be audio recorded. Because your voice will be potentially identifiable by anyone who hears the recording, your confidentiality for things you say on the recording cannot be guaranteed although the researcher will try to limit access to the recording as described below.

What are the risks to me?
The Institutional Review Board at the University of North Carolina at Greensboro has determined that participation in this study poses minimal risk to participants.

If you have questions, want more information or have suggestions, please contact:

Mrs. Christie Abernathy, Principal Investigator   Dr. Carl Lashley, Ph.D.
University of North Carolina at Greensboro   University of North Carolina at
Greensboro
(828)430-0995   (336) 545-0916
c_aberna@uncg.edu   c_lashle@uncg.edu

If you have any concerns about your rights, how you are being treated, concerns or complaints about this project or benefits or risks associated with being in this study please contact the Office of Research Integrity at UNCG toll-free at (855)-251-2351.

Are there any benefits to society as a result of me taking part in this research?
The results and findings of this study may assist teachers and principals in helping to increase the amount of differentiation and quality of enrichment that takes place by leveraging one-to-one classrooms.

Are there any benefits to *me* for taking part in this research study?
Participants may benefit from this study in the self-reflection they provide in the interviews and in the focus group discussion with other teachers.

Will I get paid for being in the study? Will it cost me anything?
There are no costs to you or payments made for participating in this study.

How will you keep my information confidential?
All information obtained in this study is strictly confidential unless disclosure is required by law. Information received in this study will be kept in a password protected file on the hard drive of the researcher's computer. Participants will not be identified by name when data is disseminated and pseudonyms will be used for participants as well as school/school district.

What if I want to leave the study?
You have the right to refuse to participate or to withdraw at any time, without penalty. If you do withdraw, it will not affect you in any way. If you choose to withdraw, you may request that any of your data which has been collected be destroyed unless it is in a de-identifiable state. The investigators also have the right to stop your participation at any time. This could be because you have had an unexpected reaction, or have failed to follow instructions, or because the entire study has been stopped.

What about new information/changes in the study?
If significant new information relating to the study becomes available which may relate to your willingness to continue to participate, this information will be provided to you.

Voluntary Consent by Participant:
By signing this consent form/completing this survey/activity you are agreeing that you read, or it has been read to you, and you fully understand the contents of this document and are openly willing consent to take part in this study. All of your questions concerning this study have been answered. By signing this form, you are agreeing that you are 18 years of age or older and are agreeing to participate, in this study described to you by Christie Abernathy.

Signature: _____ Date: _____

APPENDIX C

OBSERVATION FORM

Observation Setting:
School A or B
Teacher 1 2 3
Number of students in the classroom?

Focus:
- How many high-performing students are using a one-to-one device daily?
- What types of things are high-performing students using the devices for Word, Research, Software type programs?
- Are there different assignments for high-performing students versus the rest of the class?
- If so how are the assignments different? How do you assign those, and where can students access them on their device?
- What is the high-performing student task?
- What is the intended learning goal for high-performing students?
- How does the teacher interact with the high-performing students during the class?
- Are the high-performing students engaged?
- Are high-performing students grouped differently in the classroom or just by their online assignment?
- Are the activities assigned rigorous and help students go deeper into the content?
- Can the students carry out independent work or do they need assistance?

Time	See?	Think?	Reflect?

APPENDIX D

INTERVIEW QUESTIONS FOR TEACHERS

Demographic Information:

- How long have you been teaching?

- For the purposes of this study, "high-performing students" are those who have attained a 4 or 5 or are predicted to make a 4 or 5. This is the top group of performing students in Reading and/or Math in your classroom.

- Describe the range of achievement levels in your current classroom you are serving? How do you have them grouped?

- How long have you had one-to-one device in your classroom?

- Does each child have an assigned device? What type of device?

Questions 1-17

1. Tell me about how you identify high-performing students' success?

2. How do you use one-to-one device in your classroom in whole group?

3. What do you think it means to differentiate?

4. How do you differentiate learning for high-performing students?

   a. How do you use the 1:1 device to differentiate for high-performing students?

      i. Can you describe an example?

1. How do you use the 1:1 device to promote student engagement?

2. How are the activities assigned on the device to engage students different for the identified high-performing students from those who are not?

3. How, if at all, are high-performing students surveyed in your classroom to identify their interests and learning style?

4. What rigorous assignments or programs have you used that you feel like contribute to helping your high-performing students grow in the classroom?

    a. To what extent are the activities high order activities?

1. How do you check for understanding using a device?

2. Can you share a personal story of a high-performing student whom you have had in your class who made exceptional growth? If so, please share the story and tell me what contributed to the success? What role did the device play?

3. In what ways can districts support teachers in using devices to help provide differentiation and enrichment?

4. Is there any other information you would like to discuss that you feel like contributes to the success/growth of high-performing students and the use of one-to-one devices in your classroom?

APPENDIX E

FOCUS GROUP GUIDE

Focus Group Guide

Number of Participants in the Group:
Date:
Time:
Location:

1. Since the adoption of one-to-one devices in the elementary school, how has the schedule of the school day changed?
2. How has the environment of the classroom changed?
3. Do you think that leveraging one-to-one devices allow you to maximize more time with students by each child having their own device?
4. In what ways or through what programs have you used one-to-one devices to provide enrichment activities for high-performing students in the classroom? High-performing being the students who have or are projected to have a level 4 or 5 on their EOG. (Top Reading or Math Group students)
5. Do you think that high-performing students are more engaged in working independently on the devices or other ways than other students? If so what are those ways?
6. Have you observed a change in high-performing students' engagement with the use of devices? If so, in what ways?
7. To what extent do your high-performing students work independently on assignments or activities using devices? Can you provide an example?
8. To what extent do your high-performing students work in groups on assignments or activities using devices? If so, what resources do they use to collaborate? Can you provide an example?
9. How do you use devices in the classroom to differentiate for student level?
10. How have you changed the way that you plan for assignments or instructional materials by having devices in your classroom?
11. To what extent you seen an increase in assignments involving higher-order thinking skills by using devices? Can you provide an example?
12. What professional development has been the most useful for you in integrating devices?
13. What professional development do you still need?
14. Do you like using devices in the classroom? Why or why not?