HOW ELEMENTARY SCHOOL TEACHERS MAKE SENSE OF PERSONALIZING INSTRUCTIONAL PRACTICES IN DIGITAL LEARNING ENVIRONMENTS

by

CATHERINE GRACE STANISZEWSKI

(Under the Direction of SALLY J. ZEPEDA)

ABSTRACT

In response to the recent push for personalized digital learning environments in American education, this study describes eight upper elementary school teachers’ understanding and implementation of personalized digital learning environments within their classrooms. Using case study methodology and sense-making theory framework, this study examined the perspectives through interviews, participant generated reflections, and documents. Purposeful and criterion sampling was employed to determine participants for the purpose of this study. The responses of the eight participants were evaluated and coded, categorized and evaluated for emerging themes. While there are numerous studies on the use of technology to improve engagement and motivation, the research surrounding personalized digital learning environments is just beginning to surface. The significance of the findings from this study will add to the minimal body of research that examines personalized learning through digital learning environments. Thematic analysis uncovered five themes related to elementary teachers’ sense-making of personalizing instructional practices in digital learning environments including: understanding, collaborating, preparing, implementing, and reflecting.

INDEX WORDS: Digital Learning Environment, Digital Means, Personalized Learning
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by

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DEDICATION

- For Jonathan -

Thank you for reminding me that life is inevitably short. To live it large and with lots of love.

To set “life goals” and go for them.
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“We must find time to stop and thank the people who made a difference in our lives.”
- John F. Kennedy

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CHAPTER 1

INTRODUCTION

John Dewey (1944), American philosopher, psychologist and education reformer, once argued, “If we teach today’s students as we taught yesterday’s, we rob them of tomorrow” (p. 167). While this statement was made seventy years ago, Dewey’s assertion remains true. Students need to be provided an alternative way to learn as the traditional one-size-fits-all delivery system has failed them (Culatta, 2012; Sarason, 1990). Teachers across the United States have known for many years that the traditional approach to teaching and learning is not always an effective means to engage, motivate, inspire or challenge students. (Bray & McClaskey, 2015; Demski, 2012; Headden, 2013; Project Tomorrow, 2012). In 2012, while serving as the U.S. Department of Education’s Director of the Office of Educational Technology, Richard Culatta indicated that the traditional classroom model does not consider the unique needs and strengths of students (2012). Consequently, this outdated way of educating students may lead to underachievement, higher dropout rates, and students who are ill prepared to compete in a global marketplace (Friedman, 2005; Wagner, 2008).

As students’ needs have changed over the past few decades, so has the need for teachers to examine the most practical and accessible ways in which they enhance their own craft (Levine & Marcus, 2010). As educators have searched for a more personalized approach to teaching students, they have explored individualized learning, differentiated learning, and increased collaborative learning among students. In addition, teachers have begun to look to the role of
technology to enhance and personalize the learning experiences for students (American Institutes for Research, 2013; Demski, 2012).

But, how will this paradigm shift regarding the use of technology and personalized learning impact the role of America’s classroom teacher? This question, along with many others, surfaced while framing this study. Other questions that surfaced include the following: How do teachers understand, plan, and implement personalized learning for all students? Why is technology so central to the outcomes of personalized learning? How are teachers adjusting their instructional practices to support personalized digital learning? What does it mean to personalize teaching using digital tools? What types of support do educators need to enhance teaching in digital learning environments?

The technology shift in education may prove to be the most effective strategy to improve learning for all students. However, understanding how teachers make sense of personalized learning through digital learning environments may impact the effectiveness and efficiency of the implementation of it to improve instruction and student achievement in the 21st century.

**Background of the Study**

Watts-Taffe, Laster, Broach, Marinak, Connor, and Walker-Dalhouse (2012) reported, “Because every child learns differently, and every child is different, the most effective instruction is designed to fit each learner” (p. 5). Efforts to tailor the learning experiences for students in the field of education have been attempted as early as the 1950s (Washburne, 1953). This emphasis for teachers to personalize their instructional practices to improve student engagement, motivation, and achievement continues to remain an important conversation in education and can be seen throughout America’s schools today (Davis, 2014; Herold, 2014; Manzo, 2010). In fact, since 2004 the U.S. Department of Education touched on the need for
personalized learning in previously crafted National Education Technology Plans (U.S. Department of Education, 2004, 2010). Following the development of the 2010 National Education Technology Plan, the U.S. Department of Education also initiated a Race to the Top-District grant program encouraging state and local agencies to design innovative plans that emphasized personalized learning environments for students (U.S. Department of Education, 2010). The American Institutes For Research (2013) document described the purpose of the District grant competition:

In 2010 and 2011, the U.S. Department of Education awarded 18 states and the District of Columbia Race to the Top funds to implement comprehensive reform plans designed to spur education innovation, increase student achievement, narrow achievement gaps, improve high school graduation rates, and prepare students for college and career. (p. 2)

While there is a multitude of support for personalized learning, there is little clarity as to what it means to personalize instruction within schools and classrooms. This lack of clarity leaves many administrators, teachers, and parents wondering the following: What is personalized learning? Why is there a strong emphasis on its implementation? What does it look like in America’s classrooms?

The idea of personalized learning is not new. In fact, the term personalized learning, as well as the concept can be traced back to the early 20th century (Washburne, 1953). Despite its history, confusion lies in the semantics since personalized learning resembles other educational terms including individualized learning and differentiated learning. So, how do these concepts differ and why is personalization so important? To understand personalized learning, first one must understand individualized and differentiated learning as they are seemingly connected.
Individualized Learning

Individualized learning has been discussed and explored in the field of education over the last 60 years (Baker & Goldberg, 1970; Frazier, 1968; Heathers, 1977; McKeegan, 1968; Ogston, 1968). The definition of individualized instruction has taken on a various meanings, particularly when compared to those of early researchers and writers on the topic. Interestingly, many classic researchers describe individualized instruction similarly with personalized and differentiated instruction. In fact, Baker and Goldberg (1970) defined individualized instruction as:

A highly flexible system of multiple materials and procedures, in which the student is given substantial responsibility for planning and carrying out his own organized program of studies, with the assistance of his teachers, and in which his progress is determined solely in terms of those plans. (p. 775)

Moreover, Heathers (1977) describes individualized learning as “consisting of many steps taken in planning and conducting programs of studies and lessons that suit them to the individual student’ learning needs, learning readiness, and learner characteristics or ‘learning style’” (p. 342).

Conversely, other researchers and writers on the topic of individualized learning thought differently regarding the meaning of the term and how it should be carried out in classrooms. Blake and McPherson (1968) indicated, “individualized instruction is a learning program for each curriculum area and is organized in such a way that each child is able to move at his own pace under the guidance of a teacher” (p. 9). Furthermore, individualized instruction was found to occur within a subject area, where the student and teacher would collaboratively select materials and determine the order and pacing based on the learner’s individual needs (Baker & Goldberg, 1970). Regardless of almost 60 years difference, the U.S. Department of Education’s National Education Technology Plan (2010) indicated that individualized instruction considers
the unique pacing needs of students and while “learning goals are the same for all of the students, the students can progress through the material at different speeds based on their learning needs” (p. 11). Additionally, Bray and McClaskey (2015) believed:

Individualized learning involves learners with special needs who have an Individualized Education Plan (IEP). These learners have been evaluated to determine their strengths and weaknesses in areas such as reading, math, writing, and other cognitive challenges. From these evaluations, a set of measurable goals is determined along with accommodations for the individual learner in an IEP. (p. 13)

There was agreement between Bray and McClaskey’s (2015) and the NETP’s (2010) descriptions of individualized learning, focusing on the “unique pace of individual students” and “calibrating instruction” to meet those needs (Grant & Basye (2014, p. 2).

While these definitions of individualized learning have varied to some extent, the common theme between researchers’ characteristics of individualized instruction is the modification of a student’s learning objectives and pacing based on his or her instructional needs (Grant & Basye, 2014; Bray & McClaskey, 2015; Frazier, 1968; Heathers, 1977; Slavin, Madden & Leavy, 1982; U.S. Department of Education, 2010). Therefore, the aforementioned description will be referred to as the defining characteristics of individualized learning for the purpose of this study.

**Differentiated Learning**

While the term and concept of individualized instruction has been around for many decades, differentiated instruction did not make its appearance as a fully developed model in education until 1999 (Tomlinson, 1999). Since its debut, differentiated learning has grown exponentially. Tomlinson (2000) stressed, “What we call differentiation is not a recipe for teaching. It is not an instructional strategy. It is a way of thinking about teaching and learning” (p. 6). Watts-Taffe, Laster, Broach, Marinak, Connor, and Walker-Dalhouse (2012) supported that differentiated instruction is not a single strategy, but rather an approach to instruction that
incorporates a variety of strategies. Tomlinson and Allan (2000) believed that the goal of a differentiated classroom was "to maximize student growth and individual success" (p. 4) by providing many avenues for students to acquire content, to process information and ideas, and to develop products. Other researchers agreed with Tomlinson that differentiated instruction allowed all students to access the same classroom curriculum by providing tailored entry points, learning tasks, and outcomes based on each student’s learning needs (Hall, Strangman, & Meyer, 2003). In addition, Basye and Grant (2014), writers for the International Society for Technology Education (ISTE), wrote that differentiated learning works when “a teacher responds to a student’s unique learning needs through the learning process, the educational content, or the specific learning vehicle or product, based on a student’s interests, learning profile, or readiness” (p. 2). Essentially, differentiation was the teacher’s response to meeting the unique instructional needs of individual students within a classroom.

A differentiated classroom is described as one in which learners are constantly growing and changing as they participate in various learning events (Watts-Taffe et al., 2012) The National Education Technology Plan (2010) supported this belief stating:

Differentiation refers to instruction that is tailored to the learning preferences of different learners. Learning goals are the same for all students, but the method or approach of instruction varies according to the preferences of each student or what research has found works best for students like them. (p. 12)

Furthermore, Basye and Grant (2012) believed differentiated learning tailors the instruction to meet a student’s interests, goals and learning needs. While the standards may be the same for groups of students, “the teacher has the latitude to use whatever resources and approaches they see fit to connect with a student or use practices that have proved successful for similar students” (Basye & Grant, 2012, p. 1).
While the descriptions of differentiated instruction vary to some degree, most agreed with Tomlinson (2001) that differentiated instruction occurs by focusing and adjusting instructional practices for individual students based on the process by which students learn, the products or demonstrations of their learning, the environment in which they learn, and/or the content in which the students are learning.

**Personalized Learning**

The idea of personalized learning has been used in education for many years; however, it was not until recently that it emerged with new meaning since its mention in the National Education Technology Plan (U.S. Department of Education, 2004, 2010). Similar to differentiation, personalized learning is thought to be a student-centered teaching and learning model that acknowledges and accommodates the range of abilities, prior experiences, needs, interests and goals of each student with the objective of moving every student to a higher standard of achievement (Bray & McClaskey, 2015; Cavanaugh, 2014; Wolf, 2012). However, personalized learning puts the student at the center, as they become active participants in determining the direction of their learning (U.S. Department of Education, 2010; O’Donoghue, 2010; Project Tomorrow, 2012). Keefe and Jenkins (2000) described the role of the teacher in personalized instruction as to consider student academic strengths, weaknesses and learning preferences, to assist in the development of student-generated learning goals, and to use this information to thoughtfully plan appropriate instructional practices for individual students. With the shift in instructional practices to a student-led learning path, teachers in a personalized learning environment serve more as mentors and facilitators to provide authentic and reflective learning experiences for students instead of being the sole provider of information (Bray & McClaskey, 2015).
O’Donoghue (2010) agreed that personalized learning, “reflects learner’s interests, preferred approaches, abilities and choices, and tailored access to materials and content” (p. 33). However, the U.S. Department of Education’s Race to the Top – District program added that personalized learning was “a new approach to understanding how and where education is delivered, how students learn, and the roles of teachers, parents, and the broader community in supporting students’ academic successes” (American Institutes For Research, 2013, p. 1). The emphasis on “how and where” learning takes place and the “roles of teachers, parents and the broader community” is one major variance between personalized and differentiated and individualized learning. In fact, Bray and McClaskey (2015) supported this point stating, “when the teacher is directing the learning, the teacher tends to be the hardest-working person in the classroom” (p.11); yet, in a personalized learning environment, “learners have voice in what they are learning based on how they learn best…and a choice in how they demonstrate what they know and provide evidence of their learning (p. 14). With the role of technology in a personalized learning environment (versus differentiated or individualized learning), “the learner develops the skills to select and use the appropriate technology and resource to support and enhance their learning” (Bray & McClaskey, p. 15, 2015). The establishment of such skills and ease of access to technological devices allows students to extend the time and place of their learning outside of traditional classroom setting.

The idea of personalizing learning for students is not a novel concept. However, what is new is the use of technology to efficiently and effectively personalize learning paths for students (Bray & McClaskey, 2015; Project Tomorrow, 2012; U.S. Department of Education, 2010). In fact, many companies are creating learner profiles in which, “the goal is to generate ever-more comprehensive portraits of each student’s strengths, weaknesses and preferences in order to
provide them with customized academic content” (Herold, 2014, p. 1). Additionally, the U.S. Department of Education Race to the Top-District grant program promoted the use of personalized learning through blending learning environments or “the use of technology-based instructional strategies, tools, and courses” (American Institutes For Research, 2013, p. 3) to enhance the physical learning environment for students. Thus, these new technologies are designed to assist in teacher preparation, data analysis, adjustment in instruction, etc. when personalizing learning for each individual student.

The responsibility of personalizing each assignment across the content, process and product for every student seems to be an impossible and time-consuming task for teachers. Nevertheless, with the support of new and emerging technology tools and digital learning environments, this task may soon prove to be easier for teachers and may also provide accuracy in identifying individual student needs. The use of digital devices and technology-based tools can improve assessment for learning and teacher’s data collection procedures, as it can provide information on student progress and academic successes (Bray & McClaskey, 2015; O’Donoghue, 2010; U.S. Department of Education, 2010).

With today’s access to technological devices and immediate access to digital information, individualization or differentiation alone is not enough. The combination of both individualization and differentiation, along with the support of technology, to personalize learning is vital to enhance and support learning as it takes into consideration that students vary in all aspects including gender, social roles, culture, education background, learning styles, cognition, attention, pacing and interests (Looi, Song, & Wong, 2012). Moreover, Demski (2012) detailed:
The reasons for the emergence of the concept of personalized learning are multifaceted: in part it is a response to addressing the challenges of living and working in modern society; in part it is capitalizing on the affordances of new technologies and how they can be individually appropriated and enable learners to be part of a global, connected distributed intelligence and in part it is due to a recognition that current educational provision is too narrow and restrictive and is not meeting either the needs of individuals or society as a whole. (p. 32)

By personalizing learning for students by assessing their interests, learning styles, achievement, and involving the students in designing their own learning, teachers can adjust their instructional techniques to enhance the learning experiences and achievement for every student in the classroom.

**Statement of the Problem**

There is a large body of literature on the use of technology and digital tools in education to improve students’ motivation and engagement (Dede & Richards, 2012; Wolf, 2012). There is even research that supports parents’ perspectives of the use of technology to enhance student learning. In fact, a survey provided by Project Tomorrow (2012) argued, “it is not surprising that 87 percent of parents stated that the effective use of technology at school has an important impact on their child’s success, with 50 percent of parents ranking the effective use of technology as extremely important” (p. 9). While there are data that suggest that parents seem to be connecting the dots of personalized digital learning and student achievement, there is little regarding how personalized learning affects teachers’ instructional decisions or needs. The lack of research surrounding teachers’ thoughts and ideas about personalized learning through digital means is, at best, minimal (An & Reigeluth, 2012; O’Donoghue, 2010; Okita & Jamalian, 2011). Nevertheless, at an increasing rate around the country, schools are implementing personalized digital learning environments to improve teacher instruction and student learning (Adamov-Villani & Dib, 2012; American Institutes For Research, 2013; Project Tomorrow, 2012). Still,
meaningful professional learning, collaboration, and specialized supports are needed to improve
the instructional practices of teachers when implementing personalized learning and the uses of
technology (An & Reigeluth, 2012; Deed, Lesko, & Lovejoy, 2014).

As stated previously, many schools across the nation have implemented some form of
technology resource program where students are able to bring their own technology or a device
is provided to students for instructional use while in the classroom. Due to varying initiatives
across counties and/or states, a vast number of teachers and students in America are using
technology devices and search engines for the purpose of learning while in school (Dede &
(2012) noted that, “for the most part, schools have incorporated 21st century tools as add-ons to
the teacher-centric 19th century classroom structure, in which the majority of the curriculum is
pulled from a textbook” and, more often than not, “most students learn the same thing in the
same way at the same time” (p. 32). Many teachers do not feel comfortable with the push of
technology in the classroom. In fact, the National Center for Education Statistics (NCES) study
reports that “fewer than half of teachers feel very well prepared to meet the challenges they are
facing in today’s classroom, with almost two-thirds of all teachers reporting that they do not feel
prepared to teach with technology” (cited in Oelrich, 2001, p. 6). Consequently, merely
providing students and teachers with access to digital means to enhance student engagement,
motivation and achievement is not enough.

If digital tools are to be used to improve instructional practices and to personalize student
learning experiences, additional research is needed to determine teacher needs. Additionally, a
hard look at how teachers adjust their instruction with personalized digital learning environments
should be discussed. Without these critical conversations and research, personalized learning
through digital means may likely not be implemented with fidelity in many classrooms and schools across America. The number of students whose instruction could continue to suffer is exponential. Demski (2012) agreed that “truly student-centered learning has a lot of support in high places in education, but it can’t happen without the right technology infrastructure to drive it” (p. 32). Research is needed to understand the steps teachers take and the adjustments they make to implement and to maintain personalized learning within digital learning environments. Through such a study, it is hoped to uncover teacher successes, questions, and needed supports regarding instructional technology aimed at personalizing learning for students. Understanding how teachers on the front line of this national movement are making sense of the implementation of personalized digital learning environments is critical to the improvement of the initiative and to determine the instructional needs and next steps to promote the academic success of students.

**Purpose of the Study**

The overall purpose of this study was to understand how elementary school teachers make sense of personalizing instructional practices in digital learning environments. This study seeks to understand the steps teachers take and adjustments they make to implement and maintain personalized learning within their classrooms as digital learning environments. Through such a study, the researcher hopes to uncover teacher successes, questions, and needed supports regarding instructional technology aimed at personalizing learning for students.

The present study is an important one as there is limited research on personalized learning through digital means. While there is a major push in PreK-12 education for teachers to personalize instruction and to integrate technology into their curriculum (Cator & Adams, 2012; Woolf, 2010), there are few reports of research related to teachers’ perspectives of personalized digital learning environments and how teachers make sense of this work (Project Tomorrow,
2012); therefore, it is important for acquiring a deeper understanding about how teachers make sense, visualize, plan, implement, and perhaps value personalized learning through technology (Okita & Jamalian, 2011).

In 2012, Project Tomorrow, a nonprofit organization that is dedicated to giving voice to students, published a study entitled Speak Up 2011 on personalizing the classroom experience through digital learning. The organization surveyed thousands of students, parents, teachers, administrators and librarians across the country about their use, desire, and abilities of using technology for personalized learning. While the data revealed that students, teachers, administrators, and librarians all share the common desire to have more individualized learning experiences through the use of technology, how to effectively and efficiently implement in the classrooms was not addressed. Also lacking were qualitative reports of teacher’s experiences and how they made sense of these experiences with personalizing learning.

To examine effects of personalized digital learning environments on teachers’ instruction, as well as student engagement and motivation in classrooms, initial data must be available that describes teachers’ firsthand experiences. However, there is currently no data available on how teachers make sense of personalized learning in digital learning environments.

**Research Question**

Due to the lack of research on personalized digital learning environments, yet heavy push for teachers to implement such environments in their classrooms, it was important for the researcher to gain insight on how practicing elementary school teachers interpret and give meaning to their experiences. The overall question this study sought to answer broadly was: How do elementary school teachers make sense of personalizing instructional practices through digital means?
Conceptual Framework

How one comes to know about something is a matter of conceptual framework, epistemology, methods and methodologies. Before discussing methods and methodologies, it is important to understand the conceptual framework and epistemology on which the research was built. When choosing methods and methodologies in research, one must justify their uses and according to Crotty (1998), “justification of our choice and particular use of methodology and methods is something that reaches in to the assumption about reality that we bring to our work. To ask about these assumptions is to ask about our theoretical perspective” (p. 2). The conceptual framework for this research study was sense-making theory rooted in the interpretive tradition.

When people seek knowledge or experience in some aspect of the social world in which they exist, they are arguably interpreting that world. According to Prasad (2005):

Interpretive traditions emerge from a scholarly position that takes human interpretation as the starting point for developing knowledge about the social world. . . , [and] reality exists not in some tangible, identifiable outside world, but in human consciousness itself. In other words, what is of paramount importance is how we order, classify, structure, and interpret our world, and then act on our interpretations. (p. 13)

Thus, the key to gaining knowledge is the interpreter experiencing and then making sense of, or interpreting, the experience. This multiple case study attempted to answer the research question through the interpretation of data in such a way as to enable both the researcher and the participants to construct meanings based on how the participants made sense of their work with personalizing instruction in digital learning environments.

Sense-making theory is grounded in the question, “How can I know what I think until I see what I say?” (Weik, 1979, p.133). How can teachers know what they think regarding a topic or circumstance, until they have had the opportunity to visualize it and understand it? Part of the
sense-making process involves moving from chaos to the organization of ideas of a topic or experience. Oftentimes, individuals are met with situations or experiences that are unfamiliar to them. Sense-making refers to how those individuals “structure the unknown” and make decisions on how to move forward (Ancona, 2012, p. 3). Weik, Sutcliffe, and Obstfeld (2005) explained, “sense-making involves turning circumstances into a situation that is comprehended explicitly in words and that serves as a springboard to jump into action” (p. 409). Essentially, sense-making is a continuous process of using prior knowledge, conversation, and evidence to understand unfamiliar situations or experiences that, in turn, leads to organized action.

Many sense-making theorists argue that school and classroom culture, structure, and routines, result, in part, from “micro-momentary actions” by teachers and other actors in the school (Porac, Thomas, & Baden-Fuller, 1989). Action is based on how people notice or select information from the environment, make meaning of that information, and then act on those interpretations, developing culture, social structures, and routines over time (Porac et al., 1989; Weick, 1995). The meaning of information or events – in this case, making sense of how teachers personalize their instructional practices in digital learning environments – is not given. Individuals must actively construct understandings and interpretations. They do so by placing new information into preexisting cognitive frameworks, also called “worldviews” (Porac et al., 1989; Vaughan, 1996; Weick, 1995) or “working knowledge” (Kennedy, 1989). Kennedy (1989) defined working knowledge as:

Working knowledge is the organized body of knowledge that people use spontaneously and routinely in the context of their work. It includes the entire array of beliefs, assumptions, interests, and experiences that influence the behavior of individuals at work. It also includes social science knowledge. The term working, as used here, has two meanings. First it means that this is a special domain of knowledge that is relevant to one’s job. Second, it means that the knowledge itself is tentative, subject to change as the worker encounters new situations or new evidence. (p. 2)
Thus, teachers and others draw on their existing working knowledge to interpret new instructional approaches, often reconstructing policy messages in ways that either reinforce preexisting practices or lead to incremental change (Coburn, 2001; Jennings, 1996; Schifter & Fosnot, 1993; Smith, 2000, Spillane, 1999; Spillane & Jennings, 1997). However, sensemaking is not a one-time event. In fact, sense-making is considered an on-going process that considers how people notice events, what those events mean, and how created meaning for those events influence behaviors (Miles, 2012).

**Significance of the Study**

It is hoped that the findings from this study will add to the minimal body of research that examines personalized learning in digital learning environments. The research sites are in a district piloting a one-to-one technology device program for digital learning environments for the state of Georgia, so this study may provide insight to those who seek to align local, district, state, and nation-wide practices with such a program.

There are numerous studies on the use of technology in classrooms to improve student engagement and motivation; however, the research surrounding personalized learning through digital means is just beginning to surface.

**Assumptions**

As I prepared for this research, I had some assumptions as to what my interviews with elementary school teachers would reveal. I instinctively assumed that the teachers were familiar with personalized learning and how to implement it through technology. I also assumed that the participants were actively integrating the use of technology into their instruction and would be able to communicate their knowledge and experiences with such.
Definition of Terms

*Personalized Learning* – For the purpose of this study, personalized learning will be defined in part through Bray and McClaskey’s (2015) work of individualized learning plus differentiated learning. Additionally, for the purpose of this study, personalized learning will also include the use of digital means to personalize instruction for students. In essence, individualized learning + differentiated learning + digital means = personalized learning.

*Digital Learning Environment* – For the purpose of this study, the digital learning environment includes any setting with access to the Internet including, but not limited to: school, classroom, home, library, or community center. This environment must involve technical solutions for supporting teaching and learning and may include educational software, technology applications, a digital learning tool, an online study program or resource.

*Digital Means* – For the purpose of this study, digital means can be defined as technology to access to the internet, hardware or software, digital systems, and/or any electronic applications that deliver content.

Limitations of the Study

In most qualitative research, generalizability in the statistical sense is limited by the use of small, purposeful samples (Yin, 2009). In this study, looking only at upper elementary teachers was another limitation. Additionally, the researcher was an employee of the school district in which data were collected. This factor may have limited the perceptions shared by the interviewed teachers that may have otherwise been shared with a researcher with no affiliation to the research site.
Overview of Research Procedures

The purpose of this study was to understand how elementary teachers make sense of personalizing instructional practices in digital learning environments. The design of this study was qualitative in nature. Qualitative researchers seek to “make sense of, or interpret, phenomena in terms of the meanings people bring to them” (Denzin & Lincoln, 2011, p. 3). According to Creswell (2013), “qualitative researchers use an emerging qualitative approach to inquiry, the collection of data in a natural setting sensitive to people and places under study and data analysis that is both inductive and deductive and establishes patterns or themes” (p. 44). This research was appropriate for a qualitative study because it examined the details surrounding how individual teachers at four elementary schools made sense of personalized digital learning environments.

The case study design was deemed the most appropriate for this research study. Flyvbjerg (2013) argued for the use of case study as a methodology in qualitative research because:

…the case study is a necessary and sufficient method for certain important research task in the social sciences, and it is a method that holds up well when compared to other methods in the gamut of social science research methodology. (p. 241)

The use of case study allowed the researcher to become an integral part of the research, and allowed for methods that encouraged social interaction where meaning could be constructed. Creswell (2013) stated that case study is, “a qualitative approach in which the investigator explores a real-life, contemporary bounded system or multiple bounded systems over time, through detailed in-depth data collection involving multiple sources of information” (p. 97). Additionally, in explaining what a case study is, Creswell (2013) also suggested that “a case study is a good approach when the inquirer has clearly identifiable cases with boundaries and seeks to provide an in-depth understanding of the case or a comparison of several cases.” (p.
For these reasons, case study design was deemed to be the most appropriate design for this study.

With this study, two upper elementary teachers each from four elementary schools across one small urban school district participated in interviews and developed three participant-generated reflections. Participants were determined by reputational sampling by the principals at each of the four schools.

With multiple schools participating in the study, it was appropriate for this study to be considered a collective or multiple case study in which data were compared within-site as well as across the multiple sites. Yin (2009) suggests that the multiple case study design uses the logic of replication, in which the inquirer replicates the procedures for each case. (as cited in Creswell, 2013, p. 99). This collective or multiple case study intended to illustrate and to consider participant-determined meaning of personalized digital learning environments at the elementary level in four schools in one large urban school district. The meanings made by the teachers interviewed at the four sites were each considered as a unit of analysis for this study.

Data for this study were collected using qualitative methods that included:

1. Two individual interviews conducted with each of the 8 teacher participants at the beginning and end of the data collection period,

2. Document analysis of three written reflections of each of the same eight teacher participants,

3. Document analysis of lesson plans of each of the same eight teacher participants, and

4. Document analysis of student work exemplars from the classrooms of each of the same eight teacher participants.

Using various data collection methods allowed the researcher to collect ample data aimed at answering the research question. By collecting and analyzing multiple modes of data for the
purpose of this study, the researcher was able to triangulate the data ensuring that the findings were valid and reliable.

To understand and examine how elementary school teachers make sense of how they personalize learning for their students through digital learning environments, comparative multiple case study method was chosen. This method allowed the researcher to understand the complex meanings made by teachers about personalized learning and digital means within their individual classrooms. The case study concluded with researcher-generated conclusions about the overall meanings or assertions derived from the cases.

**Organization of Dissertation**

The organization of the dissertation begins with a description of the background and the statement of the problem with the research questions, which anchors the overarching rationale for the study in Chapter 1. Additionally, this chapter provides an overview of the methods and conceptual framework, while also addressing the significance of the study. Key terms were then defined as they relate to the present study and limitations were also presented. Chapter 2 presents a review of the related literature relevant to professional learning relative to the context of the study. Chapter 3 presents the research methods. Chapter 4 presents the findings within and across each case study and Chapter 5 examines implications as well as future research based on the findings of the present study.
CHAPTER 2

REVIEW OF THE RELATED LITERATURE

The need for personalized and innovative learning strategies to improve student motivation and achievement is widespread across the United States (U.S. Department of Education, 2010; Bray & McClaskey, 2015). One way this need is being addressed is through educational reforms of personalized digital learning environments for students. However, with this new initiative, there is still much unknown about how to implement and utilize digital devices effectively to personalize the learning experiences of students.

The purpose of this study was to understand how elementary teachers make sense of personalizing instructional practices in digital learning environments. The study sought to determine the steps teachers take and the adjustments they make in their instructional practices when personalizing learning through digital means. The study asked only the following research question: How do elementary school teachers make sense of personalizing instructional practices through digital means?

In an effort to answer the research question, it was important to review the literature in several key areas. First, the researcher attempted to distinguish between personalized learning, differentiated learning, and individualized learning by comparing and contrasting the various definitions featured in classic and current literature and discussing how these strategies have influenced instructional practices in classrooms. Second, the researcher sought to understand personalized learning as it relates to teacher instructional practices in 21st century classrooms. Third, the researcher endeavored to understand learning in classrooms that is personalized
through digital means and examined the evolution of technology and its key state, national, and federal reforms. Specifically, the researcher focused on state, national and federal reforms that have influenced the instructional practices in schools from the year 2000 to present day. Finally, the researcher sought to understand the theory of sense-making and its process of how teachers moved from chaos to understanding and implementing personalized digital learning environments.

What follows is a review of the related literature surrounding this study examining the sense-making of the participants – eight upper elementary school teachers across four elementary schools within the Cobalt County School District in Georgia.

**Unclear Terminology**

There is a great deal of jargon in the field of education. Where this jargon becomes problematic is when both educational professionals and non-educational professionals begin using and evolving such terms to mean different things. For example, take the terms individualize, differentiate, and personalize. There is much confusion today in the field of education due to the evolution of their meanings, as well as their relationships to instructional practices and student learning. However, the misunderstanding surrounding these educational terms is not surprising when you compare their meanings in a dictionary, as the terms are considerably similar. In fact, Merriam Webster Online (n.d.) defines *individualize* as “to change (something) so that it fits each person’s needs, *differentiate* as “to make (someone or something) different in some way, and *personalize* as “to change or design (something) for a particular person. All three of these words indicate an action or a change to make something different. Similarly, individualize and personalize both indicate the change be specific to an individual. Based on these definitions provided by Merriam Webster, a teacher might be able to use any of
these words as synonyms when describing how they adjust their instruction based on each student’s different learning needs. However, it is most important to understand how these words differ in their relation to instructional practices, and how they are then translated into classrooms to improve student learning.

Individualized learning, differentiated learning, and personalized learning have become popular buzz words in the field of education; however, there is little agreement on the meanings of these words beyond the concept that each offers alternative ways to the traditional, one-size-fits-all model of teaching and learning. There is ample evidence that students are more successful in school and find it more satisfying if they are taught in ways that that are responsive to their readiness level (Vygotsky, 1986), interests (Csiksentmihalyi, 1997; Renzulli & Renzulli, 2010) and learning profiles (Sternberg, Torff, & Grigorenko, 1998). Nevertheless, the inconsistency surrounding the terms individualized learning, differentiated learning, and personalized learning has left educational professionals feeling overwhelmed and confused as to when and how to implement tailored learning situations and environments for students (Demski, 2012). So, how do these terms compare and contrast and what do they look like in America’s classrooms? What follows is an in-depth exploration of these educational terms and their relationship to instruction and student learning.

**Individualized Learning**

Individualized learning has been explored and has evolved in the field of education over the last 60 years (Baker & Goldberg, 1970; Frazier, 1968; Illich, 1970; McKeegan, 1968; Ogston, 1968; Rogers, 1969). Much of the research during the 1960s and 1970s on individualized learning came as a result of the post-Sputnik and space race era in an attempt to strengthen America’s approach to teaching and learning (Januszewski, 1995). As the need for
individuals to work in business, industry, government, and institutional environments grew, so did the need to produce students who were prepared to do so. Thus, researchers turned to models of individualized instruction and open education in an attempt for personal growth and development for students (Goodman, 1962; Illich, 1970; Kohl, 1969; Rogers, 1969; Silberman, 1970).

The definition of individualized learning has taken on various meanings, particularly when compared to those of early researchers and writers on the topic. Ironically, many classic researchers described individualized learning similarly with today’s personalized and differentiated learning. In fact, Baker and Goldberg (1970) defined individualized learning as:

A highly flexible system of multiple materials and procedures, in which the student is given substantial responsibility for planning and carrying out his own organized program of studies, with the assistance of his teachers, and in which his progress is determined solely in terms of those plans. (p. 775)

Moreover, Heathers (1977), described individualized learning as including a program in which the lessons are suited to the academic needs, learning style, and readiness of individual students. Additionally, during the 1970s other educational researchers wanted to replace the traditional idea of a teacher as an authority figure and believed that teachers should serve more as consultants to help students discover what they wanted to learn and to design the process in which the students would learn (Rogers, 1969; Silber, 1970; Silber & Saretsky, 1975). One educational researcher proposed an individualized approach to instruction called the “Open Learning System,” which allowed students to choose and design their learning objectives and goals (Silber, 1970). In this individualized system, the teacher’s role was to help connect the student to resources and materials related to a student’s identified learning goals and objectives and to support the student in monitoring their own progress towards meeting such goals.
Other researchers and writers on the topic of individualized learning thought differently regarding the meaning of individualized learning and how it informed instructional practices in America’s classrooms. Blake and McPherson (1968) believed individualized learning focused more on the accommodations of pacing and learning objectives stating, “individualized instruction is a learning program for each curriculum area and is organized in such a way that each child is able to move at his own pace under the guidance of a teacher” (p. 9). Furthermore, individualized learning and its instruction were found to occur within a subject area, where the student and teacher would collaboratively select materials and determine the order and pacing based on the learner’s individual (Baker & Goldberg, 1970). Based on these characteristics, individualized learning did not address student interests, nor did it provide students the flexibility to drive their own learning, as they still were “under the guidance of the teacher” (Blake & McPherson, 1968, p. 9).

In 1975, the meaning of individualized learning evolved even more as Congress passed the Education for All Handicapped Children Act (Public Law 94-142). According to the U.S. Department of Education (1998), prior to the enactment of Public Law 94-142:

(A) The special education needs of children with disabilities were not being fully met;

(B) More than one-half of the children with disabilities in the United States did not receive appropriate educational services that would enable such children to have full equity of opportunity;

(C) 1,000,000 of the children with disabilities in the United States were excluded entirely from the public school system and did not go through the educational process with their peers;

(D) There were many children with disabilities throughout the United States participating in regular school programs whose disabilities prevented such children from having a successful educational experience because their disabilities were undetected; and
Because of the lack of adequate services within the public school system, families were often forced to find services outside the public school system, often at a great distance from their residence and at their own expense. (p. 5)

Clearly, there was a major problem in American’s education system and a policy was needed to promote the academic success of all students. The *Education for All Handicapped Children Act* (Public Law 94-142) was designed to provide states and school districts with supports to promote the educational rights of, meet the individual needs of, and improve equal opportunities for learning for students with disabilities (U.S. Department of Education, 2007).

Since its initial enactment in 1975, Public Law 94-142 has been reauthorized several times. In fact, in 1997 this law was amended and renamed the *Individuals with Disabilities Education Act* (IDEA) (Public Law 105-17). With the new reauthorizations of IDEA, several improvements were made to enhance the learning experiences of and access to the curriculum for students with disabilities (Knoblauch & McLane, 1999; U.S. Department of Education, 1998).

One major development from IDEA was the establishment of the Individualized Education Program (IEP). This plan was designed as a legal educational document that guaranteed students with disabilities accommodations in the student’s least restrictive learning environment based on his or her individual learning needs (U.S. Department of Education, 1998). In fact, according to the U.S. Department of Education (1998):

> To the maximum extent appropriate, children with disabilities, including children in public or private institutions or other care facilities, are education with children who are not disabled, and special classes, separate schooling, or other removal of children with disabilities from the regular educational environment occurs only when the nature or severity of the disabilities of a child is such that education in regular classes with the use of supplementary aids and services cannot be achieved satisfactorily. (p. 30)

Based on a student’s IEP, the school and teachers were responsible for ensuring appropriate accommodations, such as extended time on assignments and assessments, and for monitoring the student’s progress toward mastering determined goals and objectives. The characteristics of
Public Law 105-17 and the Individualized Education Program aligned closely with Blake and McPherson’s (1968) and Baker and Goldberg’s (1970) descriptions of individualized learning with an emphasis on modified pacing and learning objectives for students.

Regardless of almost 60 years difference, the U.S. Department of Education’s National Education Technology Plan (2010) held a similar understanding of individualization suggesting it was an instructional practice in which the learning objectives are the same for students, but the pace and speed in which students are allowed to progress through material is varied based on their individual needs. Furthermore, Bray and McClaskey (2015) also believed, “when a teacher individualizes instruction, the teacher identifies a learner’s needs through evaluations based on their challenges and disabilities. The teacher reviews the findings and recommendations from the evaluations to adapt materials and instruction for the individual learner” (p. 11). The International Society for Technology Education (2014) as well as Bray and McClaskey’s (2015) and the NETP’s (2010) descriptions of individualized instruction, focused on the “unique pace of individual students” and “calibrating instruction” to meet those needs (Basye & Grant, 2014, p. 2).

With the development of the Individualized Education Program and the use of the word “individualized” in its name, individualized learning is often associated with special education services (Bray & McClaskey, 2015). This connection often lends itself to the modification of assignments based on grade level standards and allowing students to progress through assignments at their own pace. In fact, Bray and McClaskey (2015) also considered the IEP when they described individualized instruction as:
Involving learners with special needs who have an Individualized Education Plan (IEP). These learners have been evaluated to determine their strengths and weaknesses in areas such as reading, math, writing, and other cognitive challenges. From these evaluations, a set of measurable goals is determined along with accommodations for the individual learner in an IEP. (p. 13)

Individualized Education Programs and individualized instruction are both still an integral part of Special Education law and policy today (U.S. Department of Education, 2007).

While the definitions of individualized learning have varied to some extent, the common theme within the past and present literature on individualized learning includes the modification of a student’s learning objectives and pacing based on his or her academic needs (Basye & Grant, 2014; Bray & McClaskey; Frazier, 1968; Heathers, 1977; Slavin et. al, 1982; U.S. Department of Education, 2010). While much of the research behind individualized learning was built upon the law protecting the learning needs of students with disabilities, individualized learning strategies are not only afforded to students with an IEP, but may also be used with students who are learning the English language, students of the Gifted, as well as those who struggle academically but have not yet been identified for Special Education services. However, the defining characteristics influenced by the special education law, including modified learning objectives and tailored pacing through content, will be used to provide meaning for individualized learning for students for the purpose of this study.

**Differentiated Learning**

While the term and concept of individualized learning has been around for many decades, differentiated learning didn’t make its appearance as a fully developed model in education until 1995 (Tomlinson, 1995). Since its debut, differentiated learning has grown exponentially. Differentiated learning expert, Carol Ann Tomlinson (2000) argued that differentiation is not just a teacher adjusting the instruction based on a student’s learning preferences. In fact, Tomlinson
discussed how teachers might differentiate across four classroom elements based on a student’s interests and readiness:

(1) Content – what the student needs to learn or how the student will get access to the information;

(2) Process – activities in which the student engages in order to make sense of or master the content;

(3) Product – culminating projects that ask the student to rehearse, apply and extend what he or she has learned in a unit; and

(4) Learning environment – the way the classroom works and feels. (2000, p. 2)

Tomlinson (2000) added, “differentiated learning is not an instructional strategy, but a way of thinking about teaching and learning” (p. 2). Based on this belief, teachers are afforded the opportunity to differentiate or alter their instructional delivery, as well as the content a student learns, the process by which the student learns the content, the final product a student creates to represent the knowledge he or she gained from their learning, and the environments in which the instruction and learning takes place. Broach, Le Floch and Tannenbaum (2012) supported that differentiated learning was not a single strategy, but rather an approach to instruction that incorporates a variety of strategies.

In addition, Bray and McClaskey (2015) defined differentiation as responsive teaching where teachers proactively plan varied approaches to what different groups of learners need to learn, how they will learn it, and how they will show what they have learned. It was also believed that the goal of a differentiated classroom was "to maximize student growth and individual success" (Tomlinson & Allan, 2000, p. 4) by providing many avenues for students to acquire content, to process information and ideas, and to develop products. Other researchers agreed with Tomlinson that differentiated instruction allowed all students to access the same classroom curriculum by providing tailored starting points, learning tasks, and outcomes based
on each student’s learning needs (Hall, Strangman, & Meyer, 2003). Likewise, the International Society for Technology Education (ISTE), believed that differentiated learning worked best when “a teacher responds to a student’s unique learning needs through the learning process, the educational content, or the specific learning vehicle or product, based on a student’s interests, learning profile, or readiness” (Basye & Grant, 2014, p. 2). Essentially, differentiation is the teacher’s response to meeting the unique instructional needs of students within a classroom and the teacher is developing materials and resources for the different groups of learners.

A differentiated classroom is thought to be one in which learners are understood to be constantly growing and changing as they participate in various learning events (Broach et. al, 2012) The National Education Technology Plan (2010) supported this belief stating:

Differentiation refers to instruction that is tailored to the learning preferences of different learners. Learning goals are the same for all students, but the method or approach of instruction varies according to the preferences of each student or what research has found works best for students like them. (p. 12)

Furthermore, Basye and Grant (2014) supported differentiated learning as “a type of learning where instruction is tailored to meet the learning needs, preference and goals of individual students” and while the standards may be the same for groups of students, “the teacher has the latitude to use whatever resources and approaches they see fit to connect with a student or use practices that have proved successful for similar students” (p. 1). While many of the definitions of differentiated learning vary to some degree, most agreed with Tomlinson (2001) that differentiated instruction occurs by focusing and adjusting instructional practices for individual students based on the content they are learning, the process by which students learn, the products or demonstrations of their learning, or the environment in which they learn.

So, how does differentiation differ from individualized learning? There are several similarities between differentiated learning and individualized learning; however, there are also
several key differences. While individualized learning focuses on providing instructional accommodations for students and an alternative timeline to meet the goals, differentiated learning considers alternative contents, learning processes, final products, and learning environments for students (Basye & Grant, 2014; Hall, Strangman, & Meyer, 2003; Tomlinson, 2001; U.S. Department of Education, 2010). Typically, in a differentiated classroom, students are placed into learning groups, which are tailored to meet a small group’s interest, readiness, learning style or product preference (Tomlinson & Allan, 2000). For example, students may be placed into a small reading group based on their Lexile reading level or they could be placed into a reading group based on their book or topic choice. With differentiation, teachers have multiple opportunities to tailor the grade level standards or objectives for students through the content, process, product or environment. However, with individualized learning, students are afforded learning accommodations including adjusted timelines and/or modified content to suit their academic needs. This is also oftentimes, but not always, based on an Individualized Education Program for a student with a disability (U.S. Department of Education, 1998).

While individualized learning and differentiated learning are steps in the right direction, America’s schools have not fully succeeded in closing the achievement gap or produced students who are college or career ready (Christensen, Horn, & Johnson, 2008). However, some researchers believe personalized learning may be the answer. In fact, researchers from the Bill & Melinda Gates Foundation, stated “the best hope for accelerating student achievement is by using a range of pedagogical and technological innovations that deliver personalized learning to each student” (Benson and Childress, 2014, p. 33). So, what is personalized learning? Why is believed to be central to the improvement of student engagement, motivation and achievement in 21st century schools?
Individualized Learning + Differentiated Learning + Digital Means = Personalized Learning

The idea of personalized learning has been used in the field of education to describe various instructional approaches for many years. In fact, personalized learning comprises of several strands of educational philosophy and methodology including child-centered learning (Dewey, 1915), mastery learning (Bloom, 1971), individualized learning (Baker & Goldberg, 1970; Frazier, 1968; Illich, 1970; McKeegan, 1968; Ogston, 1968; Rogers, 1969), and differentiated learning (Hall, Strangman, & Meyer, 2003; Tomlinson, 1995, 2000; Tomlinson & Allan, 2000). However, it wasn’t until recently that personalized learning emerged with new meaning since its mention in the National Education Technology Plans in 2004 and 2010 (U.S. Department of Education, 2004 & 2010).

Personalized learning is a student-centered instructional model that accommodates a student’s academic abilities, academic needs, prior knowledge, individual interests, and personal goals with the purpose of increasing the student’s level of academic achievement (Bray & McClaskey, 2015; Cavanaugh, 2014; Looi et al., 2012; Wolf, 2012). Other researchers supported the role of the school and teacher in a personalized learning environment as “the effort in creating a learning environment that takes into account individual student’s characteristics and needs by using interactive and thoughtful instructional practices, developing student personal learning goals, and determining student academic strengths and weaknesses” (Keefe & Jenkins, 2002, para. 3). Additionally, personalized learning is believed to empower students with more autonomy by providing them with an increased opportunity to develop their own learning paths (Looi et. al, 2012; O’Donoghue, 2009; Rudd, Davia, & Sullivan, 2009) where students are able
to incorporate more “creativity, collaboration, content creation, multi-modal learning and problem solving (Looi et al., 2012, p. 681).

With much confusion surrounding personalized learning, the U.S. Department of Education (2010) attempted to define personalized learning, as well as individualized and differentiated learning, in the most recent National Education Technology Plan. In the plan, all three terms focused on the instruction provided to students. The 2010 National Education Technology Plan terms are defined and have been organized in Table 2.1 (U.S. Department of Education, 2010).

Table 2.1 U.S. Personalization vs. Differentiation vs. Individualization of Instruction

<table>
<thead>
<tr>
<th>Personalization…</th>
<th>Differentiation…</th>
<th>Individualization…</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refers to instruction paced to learning needs, tailored to learning preferences, and adapted to the specific interests of different learners.</td>
<td>Refers to instruction tailored to the learning preferences of different learners.</td>
<td>Refers to instruction paced to the learning needs of different learners</td>
</tr>
<tr>
<td>Learning goals vary based on the learner</td>
<td>Learning goals are the same for all students</td>
<td>Learning goals are the same for all students</td>
</tr>
<tr>
<td>Learning objectives, content, instructional method, and pacing may vary based on the individual learner.</td>
<td>The instructional method or approach varies to the preferences of each student or what research has found works best for them.</td>
<td>Students can progress through material at different speeds according to their learning needs.</td>
</tr>
</tbody>
</table>

(U.S. Department of Education, 2010)

According to the U.S. Department of Education’s 2010 National Education Technology Plan, personalized learning embraces differentiation and individualization so that a student’s learning is differentiated across interests and instructional delivery, as well as individually paced. Furthermore, with the 2010 plan explained that with personalized learning, a student’s learning objectives might also differ from that of his or her classmates.

While the 2010 National Education Technology Plan described a few differences between individualized learning, differentiated learning, and personalized learning, Bray and
McClaskey (2015) further explained the similarities, differences and attributes of each approach as it relates to instruction, assessment, and the student as a learner as described in Table 2.2.

Table 2.2. Summary of Bray and McClaskey’s (2013) Personalization vs. Differentiation vs. Individualization Chart

<table>
<thead>
<tr>
<th>Individualized Learning</th>
<th>Differentiated Learning</th>
<th>Personalized Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Teacher….</td>
<td>The Teacher….</td>
<td>The Learner….</td>
</tr>
<tr>
<td>Determines the same learning objectives for all students and identifies goals based on learning objectives for those who require one-one-one instruction.</td>
<td>Determines the same learning objectives for all students and identifies goals for different groups of students who require small group instruction.</td>
<td>Determines their own learning goals and monitors their progress in meeting those goals with guidance from their teacher.</td>
</tr>
<tr>
<td>Modifies the content and pace of the customized instruction based on the individual’s learning needs.</td>
<td>Modifies the content and pace of the instruction based on the needs of a group of learners.</td>
<td>Connects learning with interests, talents, passions, and aspirations.</td>
</tr>
<tr>
<td>Creates lessons and specific instructional strategies for an individual student based on his or her learning needs.</td>
<td>Creates lessons and determines appropriate instructional strategies based on the needs of a group of students.</td>
<td>Actively participates and makes decisions that drive their own learning path.</td>
</tr>
<tr>
<td>Chooses digital means to support the learning of students based on their individual needs.</td>
<td>Chooses digital means to support the learning of group of students on the group’s needs.</td>
<td>Develops skills to self-select and utilize appropriate digital means to support their own learning paths.</td>
</tr>
<tr>
<td>Recognizes the individual student is dependent on the teacher to determine learning needs, provide instruction and support the learning progress.</td>
<td>Recognizes that groups of students are dependent on the teacher to determine learning needs, provide instruction, and support learning progress.</td>
<td>Identifies and connects with peers, teachers, community members, and experts to construct a support network to guide their learning.</td>
</tr>
<tr>
<td>Uses the traditional grade level system (Carnegie unit) to monitor learning and promotion.</td>
<td>Uses the traditional grade level system (Carnegie unit) to monitor learning and promotion.</td>
<td>Uses a competency-based system to determine promotion.</td>
</tr>
<tr>
<td>Measures the progress of an individual student by utilizing data from assessments to determine what is learned and the next steps in the learning process.</td>
<td>Measures the progress of groups of students by using assessment data to determine what the students learned and the next steps in the learning process for the groups.</td>
<td>Measures, monitors, and reflects on their own progress based on the skills learned and the mastery of the content.</td>
</tr>
</tbody>
</table>
While possessing some similarities with individualized learning and differentiated learning, the greatest differences between the three approaches is student voice and the intentional use of digital means to personalize the learning process (Bray & McClaskey, 2015). The interconnected relationships between individualized learning, differentiated learning, and digital means to equate personalized learning is illustrated in Figure 2.1.

![Diagram](image.png)

**Figure 2.1 Individualized Learning + Differentiated Learning + Digital Means = Personalized Learning.**

Unlike individualized learning and differentiated learning, personalized learning intentionally utilizes digital means to support students in creating a unique and self-directed learning path. Additionally, students are able to determine the appropriate digital tools to enhance their learning to master their self-determined goals and objectives.

**Student-led learning.** Personalized learning puts the student at the center, as they become active participants in determining the direction of their learning (Looi et al., 2012; O’Donoghue, 2010; Project Tomorrow, 2012; U.S. Department of Education, 2010; Wolf, 2012). The difference lies in control. When a teacher individualizes or differentiates instruction, he or
she is in control and working harder than the students. Yet, in a personalized learning environment, “learners have voice in what they are learning based on how they learn best…and a choice in how they demonstrate what they know and provide evidence of their learning (Bray & McClaskey, 2015, p. 14).

Additionally, in a personalized learning environment there is a shift in instructional practices where teachers serve more as mentors and facilitators to provide authentic and reflective learning experiences for students, instead of being the sole provider of information (Bray & McClaskey, 2013; Wolf, 2012). Oftentimes, traditional instruction actually depersonalizes how learners learn rather than encouraging learners to take responsibility for their learning. Teacher driven instruction, pacing guides, grade levels, tests, and learners becoming complacent so that they can “do” school are not examples of personalized learning (Bray & McClaskey, 2015, p. 10). The shift in thinking of personalized learning requires schools and educational professionals to refocus on individual students rather than on the school as a whole or on subgroups of students (Looi et al., 2012; O’Donoghue, 2009).

The learning environment. Personalized learning “reflects learner’s interests, preferred approaches, abilities, and tailored access to materials and content” (O’Donoghue, 2010, p. 33). In addition to interests, readiness, and choice, other researchers explained how personalized learning transforms how teaching is delivered, where learning occurs, and the varying roles of all stakeholders in supporting student growth and success (American Institutes For Research, 2013). The emphasis on “how and where” learning takes place and the “roles of teachers, parents and the broader community” is one major variance between individualized learning, differentiated learning, and personalized learning. In fact, the personalized learning approach to instruction functions under the premise that teaching and learning may extend beyond the traditional
classroom facility in to any environment and with various people collaborating in the learning (Bray & Mccluskey, 2015; Dede & Richards, 2012; U.S. Department of Education, 2010; Wolf, 2010). Essentially, students may continue their personal learning paths outside of the classroom while immersed in the community, with mentors and friends, and/or online. The learning does not stop because a student is not sitting with a teacher in a classroom.

Currently in the United States, a majority of students’ progress in fixed grade levels from kindergarten through 12th grade is much like an assembly line reflecting an industrial age approach to education (Bray & Mccluskey, 2015; White, 2013). Moreover, most secondary and post-secondary grade levels measure student credit towards course completion based on the amount of seat time they have spent in a classroom (Mirel, 2006). These “hours spent in instruction on specified subjects” (Bray & Mccluskey, 2015) are referred to as Carnegie Units. However, the problem with measuring students’ progression through grade level completion based on seat time, is that it does not consider the unique interests, learning styles, cognitive abilities, or pacing of individual students.

Some students achieve mastery of grade level material at a significantly faster rate and at a deeper level when compared to other students. In contrast, the approach of personalizing learning for students suggests the use of a competency-based system of measurement, where learners demonstrate mastery of content in order to be promoted to the next learning level regardless of age or amount of time in the classroom or online (Iowa Department of Education, 2013). The premise of mastery learning lies in the opportunity for students to continue to work and be supported until they have succeeded in meeting their objectives (Molenda, 2012).

Moreover, to improve the United State’s education system, resources at the school, community, and online levels should be used and centered around mastery of content to enhance the learning
experience for students, improve achievement levels, and delimit the gap in achievement amongst student populations (Baily, Schneider, Sturgis, & Vander Ark, 2013).

The Carnegie Foundation (2013) conducted a national scan of states and the types of systems used to measure K-12 credit policies. The scan found that 29 states were unsatisfied with a measure of “seat time” and were making moves towards an alternative competency-based system in which students would be able to “earn credit based on what they know and do, not simply for spending a certain number of hours in classroom settings” (White, 2013, para.3). The findings from the national scan suggest that the current measure of the Carnegie Unit as a mandate is a thing of the past (White, 2013).

Digital means. The premise of personalizing learning for students is not a novel concept. What is new, however, is the use of technology to personalize the learning path for students (Bray & McClaskey, 2015; Project Tomorrow, 2012; U.S. Department of Education, 2010). In fact, in support of the personalized learning movement, many digital companies have created learner profiles in which, “the goal is to generate ever-more comprehensive portraits of each student’s strengths, weaknesses and preferences in order to provide them with customized academic content” (Herold, 2014, p. 1). Thus, these new technologies are designed to assist in teacher preparation, data analysis, adjustment in instruction, etc. when personalizing learning for each individual student. The responsibility of personalizing each assignment across the content, process and product for every student seems to be an impossible and time-consuming task for teachers. Nevertheless, the support of new and emerging technology tools and digital learning environments may assist to alleviate some of the workload for teachers and may also provide accuracy in identifying individual student needs. The use of digital devices and technology-based tools can improve assessment for learning and teacher’s data collection procedures, as it can
provide information on student progress and academic successes (Bray & McClaskey, 2015; O’Donoghue, 2010; U.S. Department of Education, 2010).

Furthermore, with the role of technology in a personalized learning environment (versus differentiated or individualized learning), students acquire the skills to select and use appropriate digital tools to support and enrich their understanding (Bray & McClaskey, 2015). The establishment of such skills and ease of access to technological devices allows students to extend the time and place of their learning outside of traditional classroom setting. The Race to the Top – District (RTT-D) program was developed to jumpstart states and local school districts to begin considering a personalized learning approach to teaching and learning (U.S. Department of Education, n.d.). Additionally, the U.S. Department of Education Race to the Top-District grant program promoted the use of personalized learning through blending learning environments which utilizes technology to enhance the physical learning environment for students (American Institutes For Research, 2013). Nakkula and Toshalis (2012) noted that the focus of personalized learning is on student voice and not on the technology. In fact, Bray and McClaskey (2013) agreed:

Personalized learning is not the same as adaptive curriculum, where technology drives the learning based on data using algorithms of performance, such as number of clicks. It is also not just about giving each learner his or her own device. The technology is there to support – not drive – the learning. (p. 14)

Therefore, it is important to understand that the focus of personalized learning is not directly on the technology, but on the learner’s motivation, engagement and voice.

While individualized learning, differentiated learning, and personalized learning do have some distinguishing characteristics in common, personalized learning possesses several unique and innovative features for teaching and learning. Learning in a personalized learning environment suggests students:
• Must know how they learn best;
• Are co-designers of the curriculum and the learning environment;
• Have flexible learning anytime and anywhere;
• Have a voice in and choice about their learning;
• Have quality teachers who are partners in learning;
• Use competency-based model to demonstrate mastery;
• Self-direct their learning, and design their learning path for college and/or career.

(Bray & McClaskey, 2013, p. 14)

Ultimately, personalized learning requires a culture shift in education and a change in the pedagogical process to create a self-sustaining system that will allow students to understand how they learn best so they can become active participants in designing, monitoring and fulfilling their educational goals (Grant & Basye, 2014; Keefe & Jenkins, 2002).

With today’s convenience to technological devices and immediate access to digital information, individualization or differentiation alone is not enough. The combination of both individualization and differentiation, along with the support of technology, to personalize learning is vital to enhance and support teaching and learning as it takes into consideration that students vary in all aspects including gender, social roles, culture, education background, learning styles, cognition, attention, pacing and interests (Looi et al., 2012). Moreover, reasons for the emergence of the concept of personalized learning were in response to addressing the challenges of living and working in modern society, capitalizing on the possibilities of new technologies and connecting students to the world around them, and recognizing that the current educational provision is not meeting either the needs of individuals or society as a whole (Buckingham, 2008; Demski, 2012). By personalizing learning for students through assessing
their interests, learning styles, achievement, while involving students in designing their own learning, teachers can adjust their instructional techniques and approaches to enhance the learning experiences and achievement for every student in the classroom.

**Education Reform and the Technology Movement**

Education reform has been on the national agenda in America for decades in an effort to improve student achievement (Johanningmeier & Richardson, 2008). Despite the efforts, the United States continues to have a lower proportion of college graduates when compared globally (U.S. Department of Education, 2010). Founder of the Center for the Advanced Study of Technology Leadership in Education, Scott McLeod believed that educational technology is the way to provide “regular and substantive opportunities” for students in order for them to “master their current technology-suffused information, economic, and learning landscapes if they are to flourish in the present and prepare for their future” (p. 52). The U.S. Department of Education has attempted to address the achievement problem and to prepare America’s students by researching the use and effect of technology in classrooms (Coley, Cradler, & Engel, 1997).

Technology in schools has evolved significantly in the past 100 years. In fact, variations of technology have been used in classrooms dating back to as far as the early 1900s, while computers have been in schools since the 1970s (Schifter, 2008). However, it is been only since 1996 that the U.S. Department of Education recognized the need for and, thus, created a National Education Technology Plan (U.S. Department of Education, 1996). Since then, several presidential administrations have reviewed, assessed and developed a National Educational Technology Plan in years 2000, 2004, and 2010. Each plan aligned with current educational policy reforms such as *No Child Left Behind* (2001) and *Race to the Top* (2008) (U.S. Department of Education, 1996; U.S. Department of Education, 2000; U.S. Department of
Education, 2004; U.S. Department of Education, 2010). These technology plans thoroughly described technology related goals in education, progress made from previous years’ plans, recommendations for support, and step-by-step guides for how the goals might be achieved. From these national plans, federal, state, and local agencies were encouraged to construct their own adaptations for implementation.

Technology has changed America’s classrooms (Coley, Cradler, & Engel, 1997). However, technology alone is not enough to improve student achievement (Campuzano, Dynarski, Agondini, Rall, & Institute of Education Sciences, 2009; Joseph, 2012; Viadero, 1997). Currently, in addition to advanced technologies, there is a new emphasis on personalized digital learning environments to improve student achievement in today’s classrooms (Grant & Basye, 2014; Bray & McClaskey, 2015; Culatta, 2012; U.S. Department of Education, 2010). So, how is the combination of personalized learning and technology transforming America’s classrooms? What follows is an attempt to understand learning in classrooms that is personalized through digital means and a chronological examination of the evolution of technology and its key state, national and federal reforms that have influenced the instructional practices in schools from the year 2000 to present day.

**America’s Educational Technology Plan**

In preparation for a new millennium, the Clinton-Gore administration along with the United States Secretary of Education, Richard W. Riley, released America’s first National Education Technology Plan (NETP) (U.S. Department of Education, 1996). This plan, entitled: *Getting America’s Students Ready for the 21st Century: Meeting the Technology Literacy Challenge*, identified four main goals aimed at preparing students and teachers for the 21st century. Those goals included:
1) All teachers in the nation will have the training and support necessary to help students learn to use computers and the information superhighway;

2) All teachers and students will have modern multi-media computers in their classrooms;

3) Every classroom will be connected to the information superhighway;

4) Effective software and on-line learning resources will be an integral part of every school’s curriculum. (U.S. Department of Education, 1996, p. 7)

The intention of the 1996 plan focused mainly on increasing technology and access to computers in the classroom. In his letter to Congress, Secretary of State, Richard W. Riley, stated, “Computers are the ‘new basic’ of American education, and the Internet is the blackboard of the future” (U.S. Department of Education, 1996, p. 5). The plan emphasized the need for mastering technological skills, such as computer skills, for learning, production and performance. Despite the fact that new and emerging technologies were not provided to schools across the nation at the time, the plan challenged educators to “envision a 21st century where all students are technologically literate” (p. 7). Providing teacher professional development, installing necessary computer hardware and software in schools, as well as connecting classrooms to the “information superhighway” were the fundamentals of America’s first education technology plan (p. 7).

The release of the first National Education Technology Plan in 1996 and the preparation of teachers and students for the 21st century spurred great interest in federal funding for the use of technology for teaching and learning in schools (Trotter, 1997). Such funding provided hardware and software technology, teacher training, and access to the internet across states and local school districts (U.S. Department of Education, 1996). The 1996 NETP, along with the increased opportunities for federal funding, prompted great attention to the use of technology to improve teaching and learning across the nation (Culp, Honey, & Mandinach, 2005).
Following the release of 1996 NETP and the evaluation of the nation’s progress on meeting its initial goals, the Secretary of Education, Richard W. Riley, and the Clinton-Gore Administration determined it was time to revise the plan stating:

We have made remarkable progress toward achieving the 1996 educational technology goals. Due in large part to federal programs such as the Technology Literacy Challenge Fund and the E-rate program, many of the nation’s teachers and students are beginning to reap the benefits of increased access to computers and the Internet. (U.S. Department of Education, 2000, p. 3)

Encouraged by the significant progress made by the 1996 technology plan, a new National Education Technology Plan was developed. This plan was designed to think beyond “Meeting the Technology Literacy Challenge” as outlined in the 1996 plan but pushed for leadership in educational technology and include all education stakeholders in doing so (U.S. Department of Education, 2000b).

**National Education Technology Plan (2000)**

In response to the first National Education Technology Plan developed in 1996, United States Department Secretary of Education, Richard W. Riley and the Clinton Administration, crafted a second technology plan entitled *eLearning: Putting a World-Class Education at the Fingertips of All Children* (U.S. Department of Education, 2000b). While tremendous progress was made towards achieving teacher training, technology skill development, and internet access goals determined by the 1996 NETP, the revised 2000 NETP sought to use the progress of technology in education as a building block and integral part for school improvement, reform efforts, and called for providing students with 21st century literacy skills (U.S. Department of Education, 2000b).

*e-Learning* (U.S. Department of Education, 2000b) built upon what was accomplished by the 1996 NETP and outlined five new goals suggesting national, state, local and private division
actions to ensure all teachers and students were afforded opportunities with new and developing technologies for teaching and learning (Culp, Honey, & Mandinach, 2005). The goals identified in the 2000 plan were developed based on the assumption that technology was readily available in all schools and that the next phase was to operate fully the possibilities provided by e-learning. The five goals outlined in eLearning: Putting a World-Class Education at the Fingertips of All Children (U.S. Department of Education, 2000b) included:

- **Goal 1**: All students and teachers will have access to information technology in their classrooms, schools, communities, and homes;
- **Goal 2**: All teachers will use technology effectively to help students achieve high academic standards;
- **Goal 3**: All students will have technology and information literacy skills;
- **Goal 4**: Research and evaluation will improve the next generation of technology applications for teaching and learning;
- **Goal 5**: Digital content and networked applications will transform teaching and learning. (p. 6)

The 2000 NETP supported the 1996 goals of teacher professional development, technology skill development, and Internet access. To ensure that technology remained at the forefront, the plan recognized research and evaluation as central to improving technology for teaching and learning, emphasized networked applications and digital content to further enhance instructional practices and student learning, and stressed the need for leadership and the role of all stakeholders. The 2000 NETP highlighted the importance of educational technology to remain a national priority stating, “It must be at the core of the educational experience, not at the periphery.” (p.7).

As a result of the new technology plan, there were many programs and other funding assistance available for educational technology. In fact, to support states and local communities in creating their own plans for integrating technology into teaching and learning, the Technology
The Literacy Challenge Fund, a five-year, $2 billion initiative was created (Kirshstein, Birman, Quinones, Levin, Stevens, & Loy, 2000). Other funded programs included the Technology Innovation Challenge Grants, Preparing Tomorrow’s Teachers to Use Technology program, Community Technology Centers program, Assistive Technology State Grants, Migrant Education Technology Grants, and the E-Rate program (Dickard, 2002; U.S. Department of Education, 2000a; U.S. Department of Education, 2004). Each of these funded programs addressed varying needs at the school and community level to provide students and teachers with technology access and training to promote teaching and learning. With the increased opportunity for grants and programs to provide funding for technology in schools and local communities, every state in the nation developed a comprehensive technology plan by the year 2000 (Noeth & Volkov, 2004). Among the recommendations for the technology plans, states were to address, in some way, professional development for teachers, as well as the integration of technology into instructional practices.

**National Education Technology Plan (2004)**

In 2001, the United States experienced a change in presidency, as well as the adoption of the *No Child Left Behind Act* (NCLB) national education policy reform (Diorio, 2015). The new NCLB education reform movement, which brought about many changes to state and local agency levels, sought to improve the academic achievement of all students by 2014 through rigorous testing (Culp et. al, 2005; Diorio, 2015). Moreover, an integral change, determined by *No Child Left Behind* act, was the expectation of the full implementation and integration of technology in education, including teachers, students, parents, and communities (Lemke, Wainer, & Haning, 2006). Specifically, the NCLB act (2001) identified several goals for Title II, Part D – Enhancing Education Through Technology:
1) To improve student academic achievement through the use of technology in elementary and secondary schools;

2) To assist every student in crossing the digital divide by ensuring that every student is technologically literate by the time the student finishes eighth grade, regardless of race, ethnicity, gender, family income, geographic location, or disability;

3) To encourage the effective integration of technology resources and systems with teacher training and curriculum development to establish research-based instructional methods that can be widely implemented as best practices by state education agencies and local education agencies. (Learning Point Associates, 2007, p. 2)

Along with the aforementioned goals set forth by NCLB in 2001, the U. S. Department of Education and the International Society for Technology in Education (ISTE) collaboratively developed national technology literacy standards that required technology literacy skills be integrated into each content area within each grade level (Learning Point Associates, 2007).

With the changes in the presidential administration, as well as the implementation of the 2001 No Child Left Behind education act, a new National Education Technology Plan emerged entitled: Toward a new Golden Age in American Education – How the Internet, the Law, and Today’s Students are Revolutionizing Expectations (U.S. Department of Education, 2004). This innovative plan recognized the impact of the NCLB reform act and believed the role technology could be powerful if used effectively and with fidelity. The 2004 NETP credited the gains made in previous years, but also recognized that the United States had not yet realized the full impact and promise of technology in education (Haning, Lemke, & Wainer, 2006; U.S. Department of Education, 2004).

Provided the sizeable funding, as well as the possibility of technology to enhance the teaching and learning experiences of students, U.S. citizens had expected exponential growth in student achievement with the implementation of the 2000 National Education Technology Plan (U.S. Department of Education, 2004). However, the reality was that, in many cases, technology
was not being used effectively. In fact, it was determined that computers, instead of transforming education, were more often pushed into a computer lab, where they were not being used regularly or preserved properly (U.S. Department of Education, 2004). The U.S. Secretary of State, Rod Paige, voiced his frustration stating, “…in most schools, it is business as usual. Computers are enclosed in computer rooms rather than being a central part of the learning experience” and that “schools remain unchanged for the most part, despite numerous reforms and increased investments in computers and networks.” (U.S. Department of Education, 2004, p. 22).

The problem was not a lack of funding to purchase hardware, software or other technologies, but a lack of training, understanding and vision for how technology could enhance teaching and learning in classrooms. Thus, the 2004 National Education Technology Plan moved away from the idea of merely providing hardware such as computers in a lab setting, but aimed at investigating a student-centered approach to using technology for teaching and learning.

Considering the possible positive impact technology could have on education and the steps needed to obtain such, the 2004 technology plan highlighted the following seven action steps:

1) Strengthen leadership;
2) Consider Innovative Budgeting;
3) Improve Teacher Training;
4) Support E-learning and Virtual Schools;
5) Encourage Broadband Access;
6) Move Toward Digital Content;

The seven action steps were developed and shared with state and local education agencies to assist in preparing all students for the opportunities and challenges of the 21st century. The action steps were accompanied by recommendations for implementation for states and districts.
According to the recommendations made by the 2004 NETP plan, schools, teachers, and administrators were directed to use data to drive instructional decisions (U.S. Department of Education, 2004). This action step was parallel with the No Child Left Behind reform act’s emphasis on rigorous testing and accountability (U.S. Department of Education, 2004). Additionally, teachers were expected to use this data to personalize instruction for students. Educator prep-programs were also expected to prepare pre-service teachers for using data to identify appropriate research-based interventions and/or instructional strategies for individual students (U.S. Department of Education, 2004).

The 2004 technology plan recognized the importance of leadership to fully implement and utilize technology effectively in classrooms. In fact, the plan suggested new partnerships, as well as a “new generation of tech-savvy leaders” (U.S. Department of Education, 2004, p. 39) to improve on and change the way technology was being used in schools. Additionally, students were encouraged to play a pivotal role in the planning process of how technology could be used to improve teaching and learning (Hinchey, 2006). In fact, the Office of Educational Technology solicited student input by surveying over 200,000 students from every state in the United States (Netday, 2004). Among the findings from data collected through the student surveys was:

Students mastered the wonders of the Internet at home, not in school. Today’s students, of almost any age, are far ahead of their teachers in computer literacy. They prefer to access subject information on the Internet, where it is more abundant, more accessible and more up-to-date. (U.S. Department of Education, 2004, p. 11)

Results, such as these, from the student surveys were shocking and presented many problems with how technology was being utilized for teaching and learning in schools across America despite the release of the previous 1996 and 2000 National Education Technology Plans (Hinchey, 2006; Netday, 2004).
Additional elements determined by the 2004 National Education Technology Plan, were the dire need to enhance teacher training through online learning courses and develop skills in using data to personalize instruction for students. In fact, the U.S. Department of Education’s 2004 National Education Technology Plan included the use of e-learning, online instruction and/or virtual schools to meet NCLB’s requirements for highly qualified teachers (Hinchey, 2006; U.S. Department of Education, 2004).

The plan suggested for states and schools move away from the use of textbooks and paper copies to full time digital and Internet access. In fact, with the new federal funding for the NCLB program, the 2004 NETP suggested several ways that technology could support achieving the program goals (U.S. Department of Education, 2004). The plan suggested a new focus on funding and “innovating budgeting” (p. 40) for technology and other digital programs to enhance student motivation, engagement and achievement, while veering away from expenditures on print materials, textbooks, and computer labs. With the recommendations of the 2004 National Education Technology Plan, states and local school districts needed a framework and standards identifying necessary skills for students and teachers to improve teaching and learning needed for the era of personalized digital learning.

21st Century Skills Initiative

Since 2002, the Partnership for 21st Century Skills has been working with states, school districts, and communities to improve instruction and learning for students and to meet the demands of the 21st century (Cox, 2008; Trilling & Fadal, 2009). In 2006, the Partnership for 21st Century Skills developed the 21st Century Skills Initiative (Partnership for 21st Century Skills, 2009). With the push for the use of technology in education, many states and local school districts across the country adopted the Partnership for 21st Century Skills model (Moeller &
Reitzes, 2011; Van Roekel, 2012). This model includes seven elements associated with personalized learning, particularly the use of technology to manage the expanded curriculum, options for students, and the attention to personal, social, and academic competencies necessary for college and career (Fadal & Trilling, 2009; Redding, 2013). In fact, the combinations of core content as well as interdisciplinary themes were developed by the Partnership for 21st Century Skills. The 21st Century Skills (2008) framework included:

1. Learning and innovation skills
   a. Creativity and innovation
   b. Critical thinking and problem solving
   c. Communication and collaboration

2. Information, media, and technology skills
   a. Information literacy
   b. Media literacy
   c. ICT (information, communication, and technology) literacy

3. Life and career skills
   a. Flexibility and adaptability
   b. Initiative and self-direction
   c. Social and cross-cultural skills
   d. Productivity and Accountability
   e. Leadership and responsibility. (n.d.)

Included in the 21st Century Skills frameworks six key elements were identified and promoted to state leaders for adoption and implementation in schools (see Table 2.3).
Table 2.3 21st Century Skills Initiative Key Elements

<table>
<thead>
<tr>
<th>SIX KEY ELEMENTS OF 21ST CENTURY LEARNING</th>
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</thead>
<tbody>
<tr>
<td>Core Subjects</td>
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<tr>
<td>21st Century Content</td>
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<tr>
<td>Learning and Thinking Skills</td>
</tr>
<tr>
<td>ICT Literacy</td>
</tr>
<tr>
<td>Life Skills</td>
</tr>
<tr>
<td>21st Century Assessments</td>
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</tbody>
</table>

(Georgia Department of Education, 2008, p. 16)

The Partnership for 21st Century Learning recognized that students need experiences inside and outside of the schoolhouse; and these educational experiences begin in early childhood, continuously building a foundation of knowledge and skills, to eventually prepare students for college and/or career (Partnership for 21st Century Skills, 2008; Van Roekel, 2012). The ultimate goal is to prepare students with the skills to be knowledgeable, competitive, and interconnected with the global marketplace.

Georgia’s Technology Plan 2007 - 2012

Following the publishing of the 2004 NETP and the development of the Partnership for 21st Century Learning, it was recommended for each to state develop its own technology plan based on the recommendations for each of the seven action steps (Lemke et. al, 2006; U.S. Department of Education, 2004). For the purpose of the study, a focus on the state of Georgia’s
technology plan was most relevant. Thus, the Georgia Department of Education (2008) developed the Georgia Technology Plan 2007 – 2012.

The state of Georgia developed a five-year plan for implementation from 2007 - 2012. To start, the Georgia Department of Education completed a national scan and raised five questions based off of the 2004 National Education Technology Plan (U.S. Department of Education, 2004):

- Are we, as a state, making progress in integrating technology into K-12 education?
- Does research support the use of educational technology?
- Do we have a state vision for the role of technology in education?
- Do we have sustained state funding sources needed to financially support the technology needs of our schools?
- Are we teaching the 21st Century skills necessary for our students to succeed in a global environment? (Cox, 2008, p. 20)

These questions were designed to help the Georgia Department of Education realize the vision of Georgia becoming a national leader in “improving student achievement by ensuring that all educators and students have the knowledge and skills necessary to be successful in a global learning community” (p. 3).

With influence from 2004 National Education Technology Plan, Georgia designed and developed several highly successful technology initiatives including GeorgiaStandards.org, the Georgia Virtual School, and the Educational Technology Training Centers (ETTCs) located throughout the state of Georgia (Cox, 2008). The GeorgiaStandards.org website was created to provide a portal which provided an estimated 8,000 teachers in the state of Georgia to a collaborative environment for content development and with access to more than 700 instructional plans. This initiative addressed the 2004 NETP’s goal of using the digital learning
environment to meet the requirements for highly qualified teacher established by the *No Child Left Behind* education act (U.S. Department of Education, 2004).

Similarly, the Georgia Virtual Schools was designed as an online program that provided students with “opportunities and options” through “over 80+ courses included Advanced Placement, Advanced Placement Practice Exams, Credit Recovery, College Preparatory, Career and Technical, Middle School Remediation, and other electives online to enhance their learning experience” (Georgia Department of Education, 2008, p. 23).

The third initiative of the 2007–2012 Georgia Technology Plan was the development of the Educational Technology Training Centers (ETTCs). Georgia implemented the use of 13 ETTCs to provide technological support to educational initiatives serving Georgia’s schools, teachers, and students (Cox, 2008). These training centers were developed to provide professional learning and collaboration and to support educators in identifying the most appropriate technologies for teaching and learning. Additionally, the ETTCs also assisted schools in monitoring their federally mandated Adequate Yearly Progress (AYP) data, monitored and implemented state and federal technology related grant programs including Title II and E-Rate, and supported Georgia Educational Technology Conference (GaETC) (Cox, 2008). Finally, “one of the most visible and successful statewide initiatives led by the ETTCs was the implementation of House Bill 1187” which required teachers in the state of Georgia to participate in and complete a special technology requirement (Cox, 2008, p. 24).

Using data to monitor progress and make informed instructional decisions, local school districts in Georgia administered surveys in the Spring 2009 and again in 2012 regarding the use and support of technology, equitable access to technology, and the effective use of technology to increase student achievement (Cox, 2008). After reviewing the national scan, state scan and the
results from a statewide survey, strengths and weaknesses of the implementation of technology in Georgia school districts were identified. From these findings, a state-level vision was developed and seven goals were identified for the years 2007-2012:

- Increase broad-based community support for Georgia’s vision to infuse 21st Century technology skills into the Georgia curriculum.
- Increase educator’s proficiency to use technology efficiently in classrooms and administrative offices.
- Increase effective instructional uses of technology in order to incorporate 21st Century technology and thinking skills into Georgia curriculum.
- Increase effective administrative use of technology to monitor student achievement and to manage business operations in school systems.
- Increase the capacity of school systems to provide the high-quality system support necessary to realize effective technology use, especially in the areas of administrative support for effective instructional technology use; professional development; technical support for hardware, software, network infrastructure, technology planning, and program evaluation.
- Achieve and/or maintain equitable access to high-quality technology programs for all students.
- Increase access for students, educators, parents, school board representatives, and other community members to technology resources that can enhance student learning. (p. 92)

In addition to the vision and goals, performance objectives, benchmarks, strategies, timelines and evaluation scores were developed in order to monitor the progress of the implementation of technology to enhance teaching and learning in Georgia’s schools (Cox, 2008). To achieve these goals, Georgia’s Department of Education highlighted several focus points for future work: “1) performance-based curriculum; 2) assessment and analysis of student data; 3) 21st Century learners; 4) 21st century learning environments; 5) differentiated instruction; and 6) high quality teachers and leaders” (Cox, 2008, p. 29).
Moreover, the Georgia Education Technology Plan noted the vital role of the media specialist in the success of the 21st Century School (Cox, 2008). In fact, the position of media specialist was to oversee several technological databases such as GALILEO and Georgia’s Virtual Library, as well as print materials. Up until this point, it was believed that there was too much emphasis on learning from technology rather than learning with technology (Hokanson & Hooper, 2004). With this need identified, Georgia Department of Education employees in “media services program and staff moved from the Division of Instructional Technology to the Division of Curriculum and Instruction” (Cox, 2008, p. 32). This move meant that media specialists worked in a new role which involved working with classroom teachers to integrate technology for teaching and learning.

**National Education Technology Plan 2010**

Despite almost 10 years work on the use of technology to enhance teaching and learning and improve student achievement, the dream had still not yet been realized for America’s schools (Callan, 2008). In fact, U.S. Secretary of State, Arne Duncan, described America’s educational status at that time as “economically unsustainable and morally unacceptable” (U.S. Department of Education, 2010, p. 2). The question of whether schools in the United States had made any advancements towards “a new golden age” in the use of technology to improve teaching and learning (U.S. Department of Education, 2004) since the implementation of the 2004 National Technology Plan was discussed by Karen Cator, director of the Office of Educational Technology, who shared at the 33rd Human Resources Development Group in Washington, D.C. on March 9, 2011:

> Until now, America’s education sector has failed to use the full power of technology, but we are poised to vastly improve the access to learning opportunities and the ability to achieve by harnessing existing and emerging technologies and investing in bold new research and development efforts. In short, we are working towards the transition from a
predominantly print-based classroom to a digital learning environment in order to improve the chances that we will in fact get many more learners over a much higher bar. (para. 24)

With similar goals in mind, the Secretary of State, Arne Duncan, and the Obama Administration, identified two urgent priorities in America’s education system:

- By 2020, we will raise the proportion of college graduates from where it now stands (about 41 percent) so that 60 percent of our population holds a two-year or four-year degree.
- We will close the achievement gap so that all students graduate from high school ready to succeed in college and careers. (U.S. Department of Education, 2010, p. 2)

In 2009, President Obama and his administration announced the adoption of the new education reform *Race to the Top* (RTT) and identified four goals to address and improve America:

- Develop rigorous standards and better assessments
- Adoption of better data systems to provide schools, teachers, and parents with information about student progress
- Support for teachers and school leaders to become more effective
- Increased emphasis and resources for the rigorous interventions needed to turn around the lowest performing schools. (whitehouse.gov, n.d., para. 2)

Based on these urgent priorities and recommendations determined by the Obama Administration, one important question was raised. What should effective learning look like in 21st century classrooms?

Along with the urgent priorities identified in the Race to the Top education reform, the presidential administration released the 2010 National Education Technology Plan entitled *Transforming American Education Learning: Powered by Technology* (U.S. Department of Education, 2010). The 2010 National Education Technology Plan sought for “revolutionary
transformation rather than evolutionary tinkering” to “provide engaging and powerful learning experiences, content, resources and assessments that measure student achievement in more complete, authentic, and meaningful ways” (U.S. Department of Education, 2010, p. v). The foundational purpose of the 2010 NETP was to dramatically improve instruction and student achievement by personalizing the learning experience for students in order to prepare them for 21st century skills and the global marketplace (U.S. Department of Education, 2010). The 2010 plan suggested teachers employ a 21st century model for instruction through technology to improve student motivation, engagement and achievement in five key areas: learning, assessment, teaching, infrastructure, and productivity.

**Learning.** Similar to the 2004 National Education Technology Plan, the 2010 NETP was designed with 21st century learners in mind. Thus, the plan emphasized leveraging the access to technology and broadband for student learning stating:

> Many students’ lives today are filled with technology that gives them mobile access to information and resources 24/7, enables them to create multimedia content and share it with the world, and allows them to participate in online social networks where people from all over the world share ideas, collaborate, and learn new things. (p. 4)

Provided the experience and ease of access to advance technologies of today’s learners, students require learning experiences that are engaging and technology that is easily accessible. The United States Department of Education (2010) believed that by leveraging the access to advanced technologies for personalized instruction is the necessary work for today’s schools. In fact, the 2010 NETP stated that the “challenge for our education system is to leverage the learning sciences and modern technology to create engaging, relevant, and personalized learning experiences for all learners that mirror students’ daily lives and the reality of their futures” (p. 9).

In addition to access of modern technology, the 2010 National Education Technology Plan emphasized learning that is personalized through digital means and that students become
the directors of their own learning paths. Furthermore, the plan recommended that while students were in control of their own learning, they must simultaneously obtain 21st century competencies including critical thinking, complex problem solving, collaboration, and multimedia communication (U.S. Department of Education, 2010; Partnership for 21st Century Skills, 2008). In order for students to become productive members of society, they must be afforded the opportunity to learn with various modes of technology that are utilized in the workforce and global marketplace (Partnership for 21st Century Skills, 2008; Van Roekel, 2012). The 2010 NETP suggested students learn with “real-world tools” such as digital content for research, 3-D design tools, wikis, blogs, and other communication and/or collaboration based electronic tools, so that they may “grapple with real-world problems” (U.S. Department of Education, 2010, p. xi). While the 2010 National Education Technology Plan provided significant guidance on how teacher and learning through the digital learning environment should look, the question of how teachers were to determine student achievement within this environment remained. Specifically, what should the assessment process look like in a personalized digital learning environment?

**Assessment.** The 2010 National Education Technology clearly recommended that “our education system at all levels will leverage the power of technology to measure what matters and use assessment data for continuous improvement” (U.S. Department of Education, 2010, p. xvii). Furthermore, the plan made several suggestions for technology assessment to inform teacher practice and improve student achievement. To begin, the plan suggested that all states and local school districts design, create and use formative assessments that could provide immediate feedback to students, parents, and teachers. This data was to be used to measure student understanding and provide teachers with information on how and where their instructional practices needed adjusting. The U.S. Department of Education argued that, “we miss a huge
opportunity to improve our entire education system when we gather student learning data in silos and fail to integrate the information” and that we should be make the student learning data collected “broadly available to decision-makers at all levels of our education system” (p. 5). The 2010 NETP envisioned states and school districts using the power of technology to enhance formative and summative assessment experiences and provide timely feedback to stakeholders in order to make instructional decisions. In fact, U.S. Department of Education (2010) also asserted:

Technology-based assessments that combine cognitive research and theory about how students think with multimedia, interactivity, and connectivity make it possible to directly assess these types of skills. And we can do so within the context of relevant societal issues and problems that people care about in everyday life. (p. 5)

The 2010 technology plan also provided an outline for the assessment process that states, local school districts, and educators could use to collect student data to adjust instructional practices to enhance students’ learning outcomes and productivity.

In addition to the design and creation of technology-based assessment was the recommendation of the need for teacher training and technology tool support. This recommendation was made so that educators would be knowledgeable in how to use the assessment process, analyze data, and take appropriate action to enhance teaching and learning for students (U.S. Department of Education, 2010). Along with the data analysis process to monitor student progress, the 2010 NETP recognized that in order for students to obtain 21st century skills, a shift in the role in the teacher and the traditional teaching model was needed.

**Teaching.** Technology can promote lifelong learning (Keren-Kolb, 2013; Popp, 2013). Based on this belief, the 2010 National Education Technology plan emphasized a model for 21st century learning in which teachers are:
Fully connected to learning data and tools for using the data; to content, resources, and systems that empower them to create, manage, and assess engaging and relevant learning experiences; and directly to their students in support of learning both inside and outside school. (U.S. Department of Education, 2010, p. 6)

Through online learning communities and social media programs, the 2010 technology plan encouraged teachers to not be isolated practitioners (U.S. Department of Education, 2010). With access to online learning communities and social media programs, teachers were now able to connect with other educators to talk about teaching and learning. Additionally, technology could provide learners, including teachers and students, with immediate access to information for learning 24 hours a day 7 days a week (Glassman & Burbridge, 2014; Moeller & Reitzes, 2011; Schifter, 2008; Technology Counts, 2007). This constant and immediate access to information can serve as a connection between formal (in school) and informal (outside of school) learning environments (Barron, 2006). In fact, the 2010 NETP suggested for states and districts to develop digital learning environments in which teachers connect with students, parents, other educators, educational experts and community partners in a collaborative attempt to improve teaching and learning experiences for students (U.S. Department of Education, 2010). Other researchers agreed that collaborative learning could enhance student learning through the use of wikis, blogs, podcasts, You Tube videos, and other social media content created by professionals in the field of education (Jenkins, 2009; Johnson, Levine, & Smith, 2009; OECD, 2008, 2009).

For this model of collaborative planning, assessing, teaching and learning to be possible, the 2010 plan also suggested that classrooms and homes be provided broadband admission and access to a digital device to leverage the access for teachers and students across states and school districts (U.S. Department of Education, 2010). With this recommendation in mind, the 2010 NETP noted the need for comprehensive infrastructure to ensure a connected model of teaching and learning for all stakeholders involved (U.S. Department of Education, 2010).
**Infrastructure.** The 2010 National Education Technology outlined the need for a thorough infrastructure, focused on student learning, that would provide teachers, students, and administrators with the resources and tools necessary to enhance teaching and learning in a 21st Century learning environment (U.S. Department of Education, 2010). Some of the tools mentioned in the plan included resources such as “low-cost Internet devices, digital authoring tools, and the Web” (p. xv), but also included people, processes, policies, and other supportable models for continuous improvement. To provide a sound infrastructure and leverage the digital opportunities for students and teachers, one of the goals determined in the 2010 NETP included the recommendations for every student and teacher have at least one digital device with broadband access for collaboration, communication, and research while in and outside of the school environment (U.S. Department of Education, 2010).

The 2010 National Education Technology Plan also suggested that states and local districts consider the use of interoperability standards for content and student-learning data, as well as financial data to make decision for continuous school improvement (U.S. Department of Education, 2010). On an operational level, the infrastructure needed included computer hardware and software. On an instructional/learning level, suggested infrastructure included the need for 24 hours a day 7 days a week access to digital information be available to all students, teachers, and administrators regardless of the time or their location. By following these suggestions, it was believed that states and school districts should provide an infrastructure that allowed students, teachers and administrators to envision a new way of capturing and sharing knowledge through technology.

**Productivity.** The last component of the 2010 National Education Technology plan included the proposal to “redesign processes and structures to take advantage of the power of
technology to improve learning outcomes while making more efficient use of time, money, and staff” (U.S. Department of Education, 2010, p. 63). This goal determined the 2010 NETP was perhaps the most crucial as it discussed the responsibilities of how, where, and where to spend educational monies to transform America’s education system. Through measuring and managing costs, using data in decision making, and reorganizing teaching and learning by leveraging technology to states and local school districts, the 2010 NETP suggested that America reconsider its essential conventions in regards to its education system.

**Implications for Education**

Advancement of technology in America’s schools has played an integral part of federal, national and state reform efforts over the last 15 years. Since 1996, the four National Education Technology Plans (1996, 2000, 2004, & 2010) have made a great impact on American education, with the greatest impact resulting from the very first NETP (Hinchey, 2006; U.S. Department of Education, 1996). Almost twenty years later, the goals of the initial 1996 plan appear very rudimentary; however, the 1996 plan was instrumental in bringing technology to the forefront on the agenda for U.S. education (Culp et al., 2005). Despite previous efforts to integrate technology, it was not until the release of the national mandate of the 1996 NETP, that there were high interests in support and funding for educational technology (U.S. Department of Education, 1996). However, this funding spurred from high interest in the National Education Technology Plans provided the motivation for K-12 systems, post-graduate agencies, and communities to be proactive in their efforts to use emerging technologies to improve teaching and learning in the United States (Dickard, 2002; State Educational Technology Directors Association, 2010; U.S. Department of Education, 2003).
Subsequent National Education Technology Plans (2000, 2004, & 2010) furthered the dream of “technological literacy” (U.S. Department of Education, 1996, p. 7). In addition, the plans promoted expectations, which grew parallel with the advancement of emerging technologies, and instruction that emphasized the need to identify and incorporate 21st century skills (Partnership for 21st Century Skills, 2008; U.S. Department of Education, 2010). The 2000 National Education Technology Plan was optimistic in the gains made by state and local education agencies, which was mainly attributed to the increased funding for educational technology (U.S. Department of Education, 2000). Furthermore, the 2000 plan supported the idea that technology in schools had been established and the role at the national level was to continue to provide support and resources for successful assimilation.

The work from subsequent and current National Education Technology Plans to establish a 21st century model of “connected” learning has contributed to the development of present day one-to-one lap initiatives and Bring Your Own Device (BYOD) programs across states and school districts in America (Demski, 2012; Partnership for 21st Century Skills, 2008; U.S. Department of Education, 2010). All of these efforts support the mission of redefining America’s education system to provide a more customized and personalized solution for students through a digital learning environment (American Institutes For Research, 2013; Dede & Richards, 2012; Ramig, 2014). Consequently, large corporations and education resource companies have thrived off the goals of the National Education Technology Plans, the 21st Century Skills initiatives, and state developed technology plans as a gateway to create digital products for data collection, student progress monitoring, and personalized learning solutions through a digital learning environment (Blumenstyk, 2014; Demski, 2012). Ultimately, the federal, national and state reforms have challenged politicians, education professionals, parents and other stakeholders in
education to rethink basic assumptions about teaching and learning, and to problem solve ways to use technology as a tool to enhance and make personal the learning for students in the 21st century in an effort to improve student achievement and prepare students for college and/or careers.

**Theory of Sense-Making**

What is sense-making? Sense-making is a term coined by Weik, and “refers to how we structure the unknown so as to be able to act in it” (Ancona, 2012). Weik, the father of sense-making, defined it more simply as “the making of sense” (Weik, 1995, p. 4). Sense-making is “the primary site where meanings materialize that form and constrain identity and action” and results in “turning circumstances into a situation that is comprehended explicitly in words and that serves as a springboard into action” (Weik, Sutcliffe, & Obstfeld, 2005, p. 409).

Sense-making theory is grounded in the question, “How can I know what I think until I see what I say?” (Weik, 1979, p. 133). Sense-making considers the likelihood of an individual facing an experience that is new or unknown to them. By using knowledge of previous experiences and understandings, the sense-making process supports the individual by enabling them to construct meaning and understanding of the situation to make an informed decision on how to progress forward. It is the process of “structuring the unknown” (Waterman, 1990, p. 41) by “placing stimuli into some kind of framework” which allows an individual to “comprehend, understand, explain, attribute, extrapolate, and predict” (Starbuck & Milliken, 1988, p. 51). In essence, sense-making is a process that involves moving from chaos, to the organization of ideas of a topic or experience, and then into action.
However, sense-making is not a simple, but ongoing process. In fact, Ancona (2012) believed that:

Sense-making often involves moving from the simple to the complex and back again. The move to the complex occurs as new information is collected and new actions are taken. Then as patterns are identified, and new information is labeled and categorized, the complex becomes simple once again, albeit with a higher level of understanding. (p. 4)

It is important to note that action is not a separate or final step of sense-making. In fact, it is an additional way to understand the new experience, which provides additional information for an individual to bracket and determine connotation (Weik et al., 2005). Sense-making is not a one-time event. In fact, sense-making is considered an on-going process that considers how people notice events, what those events mean, and how created meaning for those events influence behaviors (Miles, 2012). Sense-making theory understands the possibility of change and requires an individual to continuously reexamine and create new meaning around a lived experience. Therefore, sense-making can be considered an on-going, cyclical process of how an individual makes sense of new information and experiences and then uses the information derived from the process to inform their next steps into action.

Many sense-making theorists argue that school and classroom culture, structure, and routines, result, in part, from “micro-momentary actions” by teachers and other actors in the school (Porac, Thomas, & Baden-Fuller, 1989). Action is based on how people notice or select information from the environment, make meaning of that information, and then act on those interpretations, developing culture, social structures, and routines over time (Porac et al., 1989; Weick, 1995). The meaning of information or events – in this case, making sense of how teachers personalize their instructional practices through a digital learning environment – is not given. Individuals must actively construct understandings and interpretations. They do so by placing new information into preexisting cognitive frameworks, also called “worldviews” (Porac
et al. 1989; Vaughn, 1996; Weick, 1995) or “working knowledge” (Kennedy, 1989). Kennedy (1989) defined working knowledge as:

Working knowledge is the organized body of knowledge that people use spontaneously and routinely in the context of their work. It includes the entire array of beliefs, assumptions, interests, and experiences that influence the behavior of individuals at work. It also includes social science knowledge. The term working, as used here, has two meanings. First it means that this is a special domain of knowledge that is relevant to one’s job. Second, it means that the knowledge itself is tentative, subject to change as the worker encounters new situations or new evidence. (p. 2)

The meaning of information or events – in this case, making sense of how teachers personalize their instructional practices through a digital learning environment – is not given. Individuals must actively construct understandings and interpretations. Understanding that action and change are often desirable outcomes of implementing new education initiatives, sense-making provides a cyclical process that can take teachers from the unknown to action. Thus, teachers and others draw on their existing working knowledge to interpret new instructional approaches, often reconstructing policy messages in way that either reinforce preexisting practices or lead to incremental change (Coburn, 2001; Jennings, 1996; Shifter & Fosnot, 1993; Smith, 2000, Spillane, 1999; Spillane & Jennings, 1997).

New education initiatives and reforms continue to be developed. Many initiatives and reforms directly impact the instructional practices of teachers in America’s classrooms. Understanding the impact of how educational initiatives, such as personalized digital learning environments, are initially understood, implemented, and reflected upon by educators is a necessity to understand how these initiatives could affect student learning.

Sense-making theory provides an appropriate lens to understand how teachers move from chaos, to an organized understanding of the implications of initiatives in their classrooms, to action, and then back again. This study, presented in Chapter 3, sought to understand the sense-
making of upper elementary teachers and their work with new education initiatives of personalizing instructional practices through digital means.
CHAPTER 3
RESEARCH DESIGN AND METHODOLOGY

The design and methodology provided in this chapter details the research process used from the beginning to end of the study. In this chapter are the (1) purpose of the study, (2) overall research question, (3) background of the study, (4) research design, (5) research methods, (6) sample selection, (7) data collection methods, (8) data analysis processes and procedures, (9) trustworthiness, and (10) limitations of the study.

Purpose of the Study

The overall purpose of this study was to understand how elementary school teachers make sense of personalizing instructional practices in digital learning environments. This study sought to understand the steps teachers take and adjustments they make to implement and maintain personalized learning within their classrooms as digital learning environments. Through such a study, the researcher hoped to uncover teacher successes, questions, and needed supports regarding instructional technology aimed at personalizing learning for students.

To further define the study, the sample was one of convenience, using reputational sampling in that teachers were selected using three criteria: 1) grade level, 2) one-to-one technology usage in their classrooms, and 3) administrative recommendation. Each teacher was interviewed twice to gain understanding of their lived experiences of implementing personalized, digital learning environments and how they made sense of this work. In addition, document analysis and three participant generated journal reflections were used to supplement and triangulate the data to support the purpose of this study.
The participants in this study included eight upper elementary school teachers. A qualitative collective case study approach was used to understand how these teachers made sense of personalized digital learning environments as individuals, within each case setting, as well as across the participants within the participating schools.

Research Question

In the United States, there is a great emphasis on the use of technology to personalize the learning experiences of students today. However, there is minimal evidence on how teachers are interpreting, giving meaning and implementing these practices for their students within their classrooms. Due to the lack of research, it was significant to this study to gain insight of how practicing upper elementary school teachers construe and make meaning of their experiences with personalizing learning for their students through digital means. The overall question this study sought to answer included: How do elementary school teachers make sense of personalizing instructional practices through digital means?

Through a critical analysis of how teachers make sense of how they personalize learning for their students through digital learning environments, the researcher hoped to add a new dimension to the limited existing literature and to provide educational leaders with information on how teacher sense-making of personalized digital learning environments influences instructional practices.

Research that Influenced this Study

There were two studies, mostly quantitative in nature, which greatly influenced the present study. Both studies provided insight on personalized learning, but lacked the lived experiences and opinions of teachers implementing personalized digital learning environments.
Mapping a Personalized Learning Journey

In fall 2011, Project Tomorrow and the Speak Up (2012) national initiative conducted a quantitative study in an attempt to understand “the use of technology for learning, 21st century skills and school of the future, as well as emerging technologies (online learning, mobile devices, and digital content), science instruction and STEM (science, technology, engineering, and mathematics) career exploration” (p. 15). Sampling was one of convenience as any school or district within the United States was provided the opportunity to choose to participate in the study.

Instruments for data collection used online surveys. For the purpose of their study, Project Tomorrow (2012) surveyed:

- 330,177 Kindergarten – 12th grade students,
- 44,006 parents,
- 36,477 teachers,
- 2,025 librarians,
- 814 district administrators, and
- 3,139 school administrators. (p. 15)

Among these participants, an estimated 5,600 private and public schools across 1,300 school districts within the United States were represented.

To ensure that the data were representative of nation-wide demographics, the results from the Project Tomorrow Speak Up 2011 surveys were compared with school level demographic statistics, including Title I status, school locale and ethnicities, which were provided by the National Center for Education Statistics (NCES). The data from the Project Tomorrow study were cross-consulted using a standard cross-tab analysis.
The key findings from the Project Tomorrow (2012) study were categorized into “dots” for “connecting and mapping a personalized learning journey” (p. 1). The categories included: 1) Personalizing learning outside of school, 2) Personalizing learning at school, 3) Personalizing learning in math class, and 4) Creating a shared vision for personalized learning (Project Tomorrow, 2012, pp. 2 – 13).

Personalizing learning outside of school. Several major themes emerged from the study regarding students’ personalizing learning outside of school. The study found that almost half of the students in grades 6-8 and 9-12 were regularly using many social media sites and digital tools outside of school to build community and connections, organize their lives and develop their digital skills. Additionally, many students were using a “Do It Yourself (DIY)” approach to personalize their own learning outside of the classroom to support their learning within the traditional classroom setting (p. 4). In fact, results from the study showed that nearly 50% of students in grades 9-12 used the online information to help them better understand a topic or concept they were learning in class, 1 in 4 students used a video that they found online to help with homework, and 30% of students in grades 6-8 and 46% of students in grades 9-12 have used Facebook as an educational tool for collaborating on classroom projects.

With students taking a DIY approach to learning, the study found that students were increasingly looking to online and digital learning for support. However, the results from the study showed that a majority of student participants were not satisfied with their access to online learning to support their learning styles. In fact, only 9% of students in grades 6-8 and 12% in students in grades 9-12 reported having had the opportunity to take an online course on their own. Of the students who have not had the opportunity to participant in an online learning course, the study also reported that 46% said they would participate in an online course if
provided the opportunity. Furthermore, results also indicated that students’ access to the Internet via 3G/4G mobile devices is the great equalizer of access for students to personalize their learning outside of the classroom. Therefore, it was recommended that schools and districts begin to think of various tools and approaches to address students’ access to online learning to personalize their learning paths outside the traditional classroom setting.

**Personalizing learning at school.** Results from student surveys indicated that student participants perceived many obstacles or barriers with their access to technology. The survey data indicated these perceived obstacles kept students from experiencing a truly personalized learning environment. In fact, the study found:

> By limiting the ability for students to choose which technologies they would like to use, be it a social networking site for class collaborations or a tablet computer for note taking, schools are in fact limited the potential for personalized learning. (p. 7)

From the survey data, the students (56% of students in middle grades and 59% of high school students) provided a very clear message that they desired the freedom to select their own digital tools for instructional purposes within the school environment. Additionally, students felt that if they could not use their own digital tools, then they desired for the schools to provide them with tools and access that were similar to their usage outside of the classroom.

**Personalizing learning in math class.** With the push for Common Core Standards for Mathematical Practices, it is essential for students to build capacity for math while being provided opportunities to drive their learning experiences. The use of digital means for math instruction is a key ingredient in unlocking students’ full potential. In fact, the Project Tomorrow (2012) study found that when students in grade 3-12 were asked to envision their ultimate math class, the results pointed to the use of technology in various capacities to enhance their learning. The survey indicated:
• 49% students wanted to collaborate with classmates on problem solving tasks
• 46% students desired the opportunity to text or email their teacher with questions
• 47% students believed playing online or computer based math games would help them to be more successful in class. (p. 12)

When considering the student survey results, it is clear that they desire the opportunity to direct their own learning, want to use a variety of digital tools to suit their individual learning needs, seek relationships with teachers that are more collaborative and include individualized support, and desire learning experiences that continue outside of the classroom.

Creating a shared vision for personalized learning. To create a shared vision for personalized learning experiences for students, Project Tomorrow (2012) surveyed middle school students, parents, and educators to determine their perspectives on which digital tools would have the greatest positive impact on student learning. The results showed similar responses in regard to several key areas. Parents (70%) and administrators (69%) believed that school wide Internet access would have the greatest impact on student learning. Students also believed school wide Internet access to be important; however, they believed having access to electronic textbooks (E-books) (61%) would be the most effective tool (p. 14). Administrators agreed with the students that E-books would be an effective tool for student support as well. Additionally, the middle school students deemed online tutors (50%) as an important digital tool for positively impacting their learning.

Interim Research on Personalized Learning

In 2014, the RAND (Research and Development) Corporation, in conjunction with the Bill and Melinda Gates Foundation, released interim statistical findings from a two-year study on the effects of personalized learning on schools (Desmond-Hellman & Gates, 2014). Participants
in the pilot study included 23 urban charter schools and almost 5,000 students across the United States. Additional criteria for school participation in the study were low-income household populations (87% of the students eligible for free and/or reduced lunch), high minority populations (86% percent were children of color), the implementation of personalized learning models for a minimum of two years, and two consecutive years of administration of the Measure of Academic Progress (MAP) assessment (Desmond-Hellman & Gates, 2014).

Mixed methods were employed to gain a broad understanding of each school’s implementation of personalized learning, as well as to comprehend the effects of these personalized teaching practices on student performance. For the purpose of the study, the RAND Corporation collected MAP student performance data, teacher logs, teacher surveys, student surveys, and conducted one-hour interviews with administrators of the participating public charter schools. The study included the analysis of student and school performance data and compared the participant data to 51 students who also attended urban schools with a similar proportion of low socioeconomic status populations. Additionally, the RAND Corporation attempted to match the student participants and non-study student participant of the same gender, grade level, and performance on the fall 2012 MAP assessment for a more precise comparison. The key findings from the Bill & Melinda Gates Foundation study were grouped into three categories. These categories included:

1. School Design Characteristics
2. Student Achievement Results
3. Teacher and Student Perceptions of Schools. (Desmond-Hellman & Gates, 2014, p. 7)

The findings determined that students attending a school with personalized learning made greater gains in math and reading over a two year period when compared to similar students from
schools with parallel characteristics that did not provide personalized learning. In fact, according to the statistical findings, the effective size gain in math was 0.41 and 0.29 in reading with nearly 2/3 of the 23 participating schools showing these significantly positive gains. Additionally, the study showed that student achievement results in math and reading test scores were at or above the national average. Furthermore, similar school practices of personalized instruction emerged including a strong focus on high expectations of students and their learning, teacher support, and technology as an instructional tool.

**Informing the Present Study**

While both studies provided insight into the use and effects of personalized learning, the mostly quantitative data lacked in depth teacher’s perspectives and experiences. Additionally, no qualitative methods were employed in the Alliance for Education study and only interviews of one administrator from each school were considered in the Bill & Melinda Gates Foundation study. Both of the aforementioned studies lacked the teachers’ lived experiences of implementing and sense-making of how they personalize their instructional practices in digital learning environments. Both studies also lacked the lived experiences of teachers on the forefront of personalizing instructional practices for students. Furthermore, at the commencement of the present study, no research, neither qualitative nor quantitative could be found. This finding points to the need for the present study of teacher sense-making about personalizing learning in digital learning environments.

**Research Design**

The rationale for this research was driven by the desire to look at personalized learning and the use of technology in schools by examining how teachers make sense of how they personalize learning for their students using digital means. Specifically, how are teachers
interpreting, organizing, planning, preparing, adjusting, and implementing this work within their classrooms? To understand how teachers are making sense of their work with personalized digital learning environments, the researcher must converse with the participants as “sense-making involves turning circumstances into a situation that is comprehended explicitly in words” (Taylor & Van Every, 2000, p. 40). In fact, such description and detail, “can only be established by talking directly with people, going to their homes or places of work, and allowing them to tell their stories unencumbered by what we expect to find or what we have read in the literature” (Creswell, 2013, p. 48). An interpretive paradigm was suitable for this study because of the researcher’s desire to describe and understand the lived experience or the differentiating factors of a particular occurrence (Merriam, 2009). Additionally, for this study, a qualitative approach was best to provide a, “complex, detailed understanding of the issue” (Creswell, 2013, p. 48). A quantitative or statistical approach using instruments, such as surveys, as a means to collect data would not yield as rich or descriptive results for the purpose of this study as it is based on how teachers make sense of a lived experience. For these reasons, a qualitative approach was most appropriate.

**Methodology – Case Study**

The methodology used in this research was case study, which according to Yin (2009) is “an empirical inquiry about a contemporary phenomenon (e.g., a “case”) set within its real-world context – especially when the boundaries between phenomenon and context are not clearly evident (p. 18). The research methods, including the case study, can be determined by the overall research question of a study. For example, case studies are appropriate when the research addresses a descriptive question – “What is happening or what happened? - or an explanatory question – “How or why did something happen?” (Yin, 2012, p. 5). This study sought to
understand how elementary school teachers at four participating elementary schools made sense of how they personalize learning for their students through digital means. Since the overall question was to understand how eight teachers across four elementary schools in one school district made sense of a common issue, the case study method was the most appropriate.

More specifically, a multiple case study methodology was used for the research as the researcher examined four bounded cases containing a similar issue. According to Creswell (2013), a multiple case study is, “the type of case study that consists of multiple cases” of a real life situation in which “the focus is on a specific issue rather than on the case itself” (pp. 294-295). Furthermore, Yin (2009), believed that a multiple case study allows the researcher to analyze similarities and differences within and across cases in a study with a goal to replicate findings across cases. Stake (2006) believed that “an important reason for doing a multiple case study was to examine how the phenomenon performs in multiple environments” (p. 23). Each case within this study provided the researcher with an opportunity to study critically the issue in depth while also allowing for exploration of the varying experiences of the phenomenon. See Figure 1. for the multiple case study research design model used for this study.
In this study, the researcher examined the sense making of teachers on a mutual issue at four different elementary schools in one school district. This allowed for the data in each case to be looked at individually, within the school setting, as well as compared across the four cases of participating schools. Yin (2009) emphasized that because comparisons are made in a multiple case study, it is imperative that the cases are carefully selected so that the researcher can predict similar results or contrasting results across cases based on a theory. Ultimately, the use of collective case study as a methodology allows the case to become a vehicle to understand better the issue (Stake, 1995). Understanding how the participants made sense of the common phenomenon within the case and across each case within the participating school district to improve the experiences and practices of teachers was the ultimate goal of this research.
Hays (2004) noted, “Case studies seek to answer focused questions by producing in-depth descriptions and interpretations over a relatively short period of time, perhaps a few weeks to a year…[and] they investigate contemporary cases for purposes of illumination and understanding” (p. 218). The collective case study of how elementary school teachers make sense of how they personalize learning through digital means sought to answer questions through a data collection process spanning a four-month period.

**Research Methods**

To ensure an in-depth analysis and understanding of the phenomenon studied, multiple sources of data were used to triangulate or round out the data. According to Creswell (2013), triangulation is a “process that involves corroborating evidence from different sources to shed light on a theme or perspective” which provides validity and reliability to the findings. A case study seeks to use as many data sources as are relevant to the study. Thus, the research methods used in this study were semi-structured one-on-one interviews, three written reflections per participant, as well as student exemplar work, lesson plans, and other documents shared by teachers for document analysis. These methods were chosen because they were collectively expected to provide the researcher with insight as to how the teachers made sense of how they personalized learning for their students through digital means.

**Interviewing**

Interviewing was an integral part of the data collection method for the this case study because “interviews enable researchers to get to core issues in the case more quickly and in greater depth, to probe motivations, to ask follow-up questions, and to facilitate individuals telling their past stories” (Simons, 2009, p. 31). In fact, Patton (2002) agreed that, “we cannot
observe everything. We cannot observe feelings, thoughts, and intentions... we have to ask people questions about those things” (p. 341).

The use of semi-structured interviews to gather data is a commonly used method for case study design. According to Taylor and Bogdan (1998), a semi-structured interview protocol uses a set of prepared questions, which act as a guide for the researcher. While it is the job of the researcher to ensure that certain questions are asked of every participant interviewed, the semi-structured format allows and encourages the researcher to interject with additional questions or probes as appropriate. Roulston (2010) explained how the participant in semi-structured interviews determines the flow of the interview in that they are asked to talk openly and freely about a topic in ways that may take an unanticipated direction. In fact, Roulston (2010) also stated that:

Although the interview guide provides the same starting point for each semi-structured interview given that it assumes a common set of discussable topics - each interview will vary according to what was said by individual interviewees and how each interview used follow up questions to elicit further description. (p. 15)

It is important for interviewers conducting semi-structured individual interviews to have highly developed listening skills to be able to pursue information and “depending on what emerges from observing a particular setting or from talking with one or more individuals in that setting” (Patton, 2002, p. 342) have the ability to be “free to go where the data and respondents lead” (Patton, 2002, p. 343) Examples of the semi-structured interview questions used in this study are represented in Table 3.1.
Table 3.1

*Semi-Structured Interview Questions*

Examples

1. Tell me about your experience with personalized learning for your students.
2. How do you personalize your instruction for your students?
3. Take me through how you planned your last lesson that personalized the instruction for your students through technology.
4. What is your perspective of technology as an instructional tool for students?

The example of open-ended questions presented in Table 3.1 allowed for the participants to share their personal experiences and thoughts on personalized digital learning environments in their own words. Furthermore, open-ended questioning allowed the researcher to respond to the individual participant’s accounts and make adjustments to the questions to probe deeper into the meaning making and understanding of the participants around the given phenomena.

**Document Analysis**

A second data collection method employed involved analyzing documents in an effort to triangulate the data and to provide an in-depth analysis of the issue. According to Merriam (2009), “documents include a wide scope of written, visual, digital, and physical material relevant to the purposes of research” (p. 139). Documents and other artifacts were collected in an effort to obtain new sources of data that were not as readily accessible by means of observation or interview (Patton, 2002). Artifacts can be gathered to account for any object in the research environment that represents a form of communication. Flick (2006) believed that documents used within a study can be categorized on a number of levels including, but certainly not limited to, the type, authorship, and method of solicitation by the researcher. Documents used for
analysis must provide greater insight in answering the research questions; therefore, it is vital that special attention be paid to the type and content of the documents used.

Documents and artifacts used in this study were purposefully selected (Flick, 2006) to ensure that contextual information was provided that would help generate knowledge to add clarity to what was occurring within the research setting (Bloomberg & Volpe, 2008). Table 3.2 is an example of the types of documents collected.

<table>
<thead>
<tr>
<th>Table 3.2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Document Types Collected</strong></td>
</tr>
<tr>
<td><strong>Examples</strong></td>
</tr>
<tr>
<td><strong>Teacher Generated</strong></td>
</tr>
<tr>
<td>Lesson Plans</td>
</tr>
<tr>
<td>Collaborative planning minutes</td>
</tr>
<tr>
<td>Other artifacts provided</td>
</tr>
</tbody>
</table>

Artifacts such as the ones listed in Table 3.2 provided the researcher with a more in-depth understanding of the process participating upper elementary school teachers undergo in making sense of the work they do to personalize their instruction for their students through the use of technology within their classrooms.

**Journaling**

Participant-generated reflections were also used for this study. Personal documents, such as journals, are “self-revealing of a person’s view of experiences” (Bogdan & Biklin, 2010, p. 134). The reflection documents were used to gain a deeper insight into teachers’ sense-making of how they personalized learning for their students and how they used technology to do so. The researcher provided prompts for the journal reflections. Some personal documents in qualitative inquiry are, “discovered rather than solicited by the researcher” (Bogdan & Biklin, 2010, p. 134).
However, researchers may also, “ask people to write for them or get others to help them produce such materials…. so that the researcher can have some hand in directing the authors’ focus and thereby get a number of people to write on a single event or topic” (p. 134). The written reflections used in this study provided the participants time to reflect on their understanding of personalized learning, the use of digital means in their classrooms, and their instructional practices. These reflections offered the researcher a deeper insight into the experiences of the participants.

For the purpose of this study, participants were asked to produce three reflective journal entries, which allowed the upper elementary school teachers time to reflect on their instructional practices with personalized learning. Furthermore, such reflections provided the researcher with insight into the perceptions of teachers regarding their experiences with implementing personalized digital learning environments and how they made sense of this work. Table 3.3 provides three journal prompts that are subject to change based on what is discovered through the participant interviews and/or the artifacts collected.

<table>
<thead>
<tr>
<th>Table 3.3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Participant Generated Journal Reflection Prompts</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Describe how you personalized a lesson for your students this week. What did the lesson(s) look like? What information did you use to personalize the lesson? How/Did you integrate the use of technology into the personalization of the lesson?</td>
</tr>
<tr>
<td>2. What are your thoughts, feelings, and/or beliefs about personalized instruction through digital means? How do you feel about the work you do with personalization?</td>
</tr>
<tr>
<td>3. How have your instructional techniques changed with implementing personalized digital learning environments? How has your perception of digital learning changed? How have your instructional support needs changed since implementing personalized digital learning for your students?</td>
</tr>
</tbody>
</table>

Journal prompts such as the ones displayed in Table 3.3 provided the researcher with a profound awareness of how the participating upper elementary school teachers made sense of
personalizing instruction for their students through digital means. It was the hope of the researcher that prompts such as these would also allow the researcher to understand more fully the steps the participants took to plan their personalized instruction, adjust their instructional techniques, and perhaps even shine a light on ways, if any, to improve upon implementing personalized digital learning environments.

**Sample Size and Selection Methods**

The school district in which the data were collected was one of convenience as the researcher was familiar with the Cobalt County School District. The Cobalt County School District was also purposefully selected because of its one-to-one technology device initiative and strong push for personalized, digital learning environments. The Cobalt School District is divided into attendance zones determined by geographic locations. The selected elementary schools were determined by purposeful sampling, as well as the principals’ willingness to participate, as “selecting information-rich case for study in depth” (Patton, 1990, p. 169) when one wants to understand something about those cases without needing or desiring to generalize all such cases.

The research sites are located in the small urban school system of Cobalt County in northeast Georgia. The Cobalt County School District operated 21 schools and served more than 13,000 students of which 7,197 students were at the elementary level during the 2014-2015 school year. The school system student population of Cobalt County was 51% African American, 20% White, 23% Hispanic, 7% Multi-racial, and 2% Asian. The school district employed 1,038 teachers of which 755 held advanced degrees. The average number of years of experience of teachers was 12 years. In the Cobalt County School District, 78.1% of the students received free/and or reduced lunch pricing for the 2014-2015 school year. The research case sites
chosen for the study were four elementary schools that were representative of the school district’s ethnic and socioeconomic makeup. The selected elementary schools were also participants of the district’s digital learning initiative employing a one-to-one take-home digital device for all students in grades 3–9. Students in grades 10-12 followed a Bring Your Own Technology (BYOT) protocol. Table 3.4 illustrates the demographic comparison of the participating research sites of the Cobalt County School System.

Table 3.4. Demographic Comparison at the Research Sites

<table>
<thead>
<tr>
<th>Research Site</th>
<th>Number of Students Served</th>
<th>% Free or Reduced Lunch</th>
<th>% African American</th>
<th>% White</th>
<th>% Hispanic</th>
<th>% Multi-Racial</th>
<th>% Asian</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cobalt County School District</td>
<td>13,054</td>
<td>78.1</td>
<td>51</td>
<td>20</td>
<td>23</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Mt. Willow Elementary School</td>
<td>584</td>
<td>60.2</td>
<td>50</td>
<td>34</td>
<td>8</td>
<td>6</td>
<td>NA</td>
</tr>
<tr>
<td>South Brookside Elementary School</td>
<td>536</td>
<td>56.5</td>
<td>40</td>
<td>44</td>
<td>5</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>T. J. Johns Elementary School</td>
<td>561</td>
<td>95.7</td>
<td>27</td>
<td>6</td>
<td>64</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Downs O’Brien Elementary School</td>
<td>578</td>
<td>87.3</td>
<td>46</td>
<td>9</td>
<td>40</td>
<td>5</td>
<td>NA</td>
</tr>
</tbody>
</table>

While the schools’ demographics vary, all four schools are representative of the school district’s makeup. In the following section, the individual profiles of the research settings will be discussed in detail.
Mt. Willow Elementary School

Mt. Willow Elementary School is a public elementary school in Cobalt County, Georgia serving grades Pre-K through 5th. Mt. Willow Elementary School is one of 13 elementary schools in Cobalt County. The school has 584 students and the demographic make up consists of 50% African American students, 34% White students, 8% Hispanic students, and 6% Multi-racial students. Mt. Willow Elementary School staffs 52 highly qualified teachers of which 37 hold advanced degrees. The average number of years of teaching experience at Mt. Willow Elementary School is 11 years. At Mt. Willow Elementary School, 60.2% of the students receive free and/or reduced priced lunch based on their family’s income. The school boasts an innovative digital learning environment and provides all students in grades 3-5 with devices to support their learning outside of school.

South Brookside Elementary School

South Brookside Elementary School is a public elementary school in northeast Georgia serving grades Pre-K through 5th. South Brookside Elementary School was built in 1923 and is one of 14 elementary schools in Cobalt County, Georgia. The school has 536 students and the demographic make-up consists of 44% White students, 40% African American students, 5% Hispanic students, 7% Asian students, and 4% Multi-racial students. South Brookside Elementary School has 43 highly qualified teachers with 33 having advanced degrees and an average of 11 years of teaching experience. Of the students at South Brookside Elementary School, 56.5% received free and/or reduced lunch pricing based on their family’s income. Elementary School also claims an innovative digital learning environment and provides 1-1 technology as well as take-home devices to all students in grades 3-5.
**T. J. Johns Elementary School**

T. J. Johns Elementary School is a public elementary school in Cobalt County, Georgia serving grades Pre-K through 5th. T. J. Johns Elementary School was built in 2009 and is one of 14 elementary schools in Cobalt County. The school has 561 students and the demographic make-up consists of 64% Hispanic students, 27% African American students, 6% White students, 2% Multi-racial students and 1% Asian students. T. J. Johns Elementary School has 49 highly qualified teachers, 37 of which hold advanced degrees, and an average of 9 years of teaching experience. At T. J. Johns Elementary School, 95.7% of the student body received free and or reduced price lunch for the 2014-2015 school year. The school also provided all students in grades 3-5 with take-home devices and innovative digital learning environments.

**Downs O’ Brien Elementary School**

Downs O’ Brien Elementary School is a public elementary school in northeast Georgia serving grades Pre-K through 5th. Downs O’ Brien Elementary School is one of 14 elementary schools in Cobalt County, Georgia. The school has 578 students and the demographic make-up consists of 46% African American students, 9% White students, 40% Hispanic students, and 5% Multi-racial students. Downs O’Brien staffs 53 teachers of which 21 have advanced degrees and an average of 16 years of experience. Of the student population, 87.3% received free or reduce price lunch for the 2014-2015 school year. The school provided all students with one-to-one digital access at school, as well as a take home device.

**Participants**

The primary criterion for selecting participants was for each teacher to work at one of the four chosen schools in the upper elementary grade levels. Initially, the researcher sought out 5th grade teachers as participants for the study. However, participating teachers were selected by the
grade level as the study sought to understand the sense-making of elementary teachers, which resulted in including fourth and/or fifth grade teachers. Furthermore, participating teachers were selected using criterion, as well as reputational sampling, as principals at each of the four schools recommended participants for the study. Creswell (2013) determined that “criterion sampling works when all individuals studied represent people who have experienced the phenomenon” (p. 155). Likewise, the use of reputational sampling was employed as a means to obtain the recommendation of knowledgeable experts for the best examples (McMillian & Schumacher, 1997).

With the use of reputational sampling, each principal selected two upper elementary teachers that had experience in implementing personalized digital learning environments and used the one-to-one digital device access afforded to the students by the school district’s digital learning initiative. All of the principals recommended two upper elementary teachers for the purpose of the study; however, various teaching positions were represented. At South Brookside Elementary School, the principal recommended a fourth grade collaborative teacher of the Gifted and Talented program and a fifth grade collaborative teacher of the Early Intervention Program (EIP) as she felt that these teachers had the experience necessary for the purpose of the study. The principal at T. J. Johns Charter Elementary School recommended a fourth grade general education teacher and fourth/fifth grade collaborative teacher of the English to Speakers of Other Languages (ESOL) Program. The principal at Mt. Willow Elementary School recommended a fourth grade general education teacher and a fourth/fifth grade collaborative teacher of the Gifted and Talented Program. At Down’s O’Brien Elementary School the principal recommended that a fourth grade general education teacher and a fifth grade general education for the participate in the study. All of the principals of the participating schools within the Cobalt County School
District made their recommendations of teachers based on their grade level positions, as well as their work and reputation in using personalized digital learning environments.

**Data Collection Methods**

For the purposes of this study, the researcher used qualitative methods to collect data including:

1. Individual interviews with the eight upper elementary school teachers from the four participating elementary schools
2. Follow up interviews with the eight upper elementary school teachers following the initial interview and the generated reflections on their experiences
3. Three participant generated reflections describing their experiences and applications of personalized digital learning environments in their classrooms over the course of 10 weeks
4. Document analysis of lesson plans from the classrooms of each of eight teacher participants were conducted.
5. Document analysis of student work exemplars from the classrooms of each of the eight teacher participants.

**Interviews**

Qualitative semi-structured interviews were used to gather data for the purpose of the study. All interviews were conducted on an individual basis and the use of open-ended questioning was employed. As a way to gain deeper understanding of the eight upper elementary school teachers, each participant was interviewed twice. The researcher met with each of the four principals of the participating elementary schools and discussed the participant criteria for the purpose of the study. Using reputational sampling, each principal recommended two upper
elementary teachers from each school. Once the participants were determined, the researcher interviewed each participant individually twice. Each of the eight participating upper elementary teachers was initially interviewed once in February and in a follow up interview in April, 2015. The individual interviews ranged between 40 and 60 minutes. The follow-up interview lasted approximately 40 minutes.

Appendix A provides a specific interview guide to be used in the individual upper elementary school teacher interviews. Each question in the interview guide is related to the overall research question and purpose of the study. The questions were designed to elicit answers and to provide data aimed at answering the research question in this case study. However, the researcher did use discretion in the use of the questions as a means to provide flexibility in the participants’ responses. This strategy allowed the researcher to probe deeper and to ask clarifying questions to gain a more in-depth understanding of the participants’ replies. Interviews were audio-recorded, transcribed verbatim, coded, and then analyzed for emerging themes. Four text sections from the interview transcriptions are shown in Table 3.5. The table shows data coded as indicative of participants understanding of personalized learning.

Table 3.5

*Spreadsheet of Codes from Interview Transcripts*

<table>
<thead>
<tr>
<th>Text from transcript</th>
<th>Code</th>
<th>Participant</th>
<th>Interview</th>
<th>Line #’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>I think that is when you tailor what you do in class to meet the needs of your students.</td>
<td>Student Needs</td>
<td>Bridgette Johnson</td>
<td>Initial</td>
<td>39 – 40</td>
</tr>
<tr>
<td>I guess it would be using the term differentiated where the activities and the lessons are tailored for the child’s needs, more than based on more rigid standards.</td>
<td>Differentiation; Student Needs; Standards</td>
<td>Rebecca Le Blanc</td>
<td>Initial</td>
<td>59 – 61</td>
</tr>
<tr>
<td>Personalized learning is giving students what they need in a manner that fits their learning style.</td>
<td>Student Needs; Learning Style</td>
<td>Kristin Chambers</td>
<td>Initial</td>
<td>32 - 33</td>
</tr>
</tbody>
</table>
Well, getting to know each student and seeing what they need and kind of presenting it to them in a way that benefits them.

<table>
<thead>
<tr>
<th>Text from transcript</th>
<th>Code</th>
<th>Participant</th>
<th>Interview</th>
<th>Line #’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well, getting to know each student and seeing what they need and kind of presenting it to them in a way that benefits them.</td>
<td>Relationships; Student Needs; Presentation of Instruction</td>
<td>Bethany Albritton</td>
<td>Initial</td>
<td>27 – 29</td>
</tr>
</tbody>
</table>

**Document Analysis**

In addition to the participant generated reflections, student work exemplars and teacher lesson plans were also analyzed to gain a more meaningful understanding of how each of these teachers were making sense of personalizing the learning for their students through digital means. The analysis of student exemplars allowed the researcher to see how each teacher personalized the learning for her students through the work samples and the role of technology in the assignment. Teacher lesson plans also provided evidence of how the teachers planned for and prepared personalized instruction for students and how – or if – they are using digital means to personalize the learning for their students.

**Journaling**

Written documents supported the purpose of the study. As a part of this study, the teachers wrote three reflections about their experiences using digital tools to personalize their instruction within their classrooms. The first reflection was written following the initial interview and the third reflection was written following the follow-up interview. The second interview was written at a time in between these two dates. All three reflections from each of the eight participants were collected and analyzed.

With this study, two upper elementary teachers each from four elementary schools across one small urban school district were chosen to participate in interviews and develop three participant-generated reflections. Participants shared their lesson plans and examples of student work for analysis. Some examples of data selected from these data are show in Table 3.6
Table 3.6

*Document Data by Source, Participant, and Codes*

<table>
<thead>
<tr>
<th>Journal Entry</th>
<th>Text</th>
<th>Participant</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>#2</td>
<td>This time I decided to ask the students how they wanted to review. We had a class discussion a few days before the review was going to take place. I simply explained to them what we needed to review and asked them how they wanted to do it. These are the responses I got: Kahoot, Review Baseball, Online games, Create our own online games using Kahoot or something similar, I-pads to do scavenger hunt with pictures or QR codes.</td>
<td>Bridgette Johnson</td>
<td>Student Choice; Student Driven; Digital Tools</td>
</tr>
<tr>
<td>#1</td>
<td>Digital tools are highly valued by our school district and it is expected that we use them in our daily lesson plans. Although technology can sometimes become overwhelming, I have discovered that when it is used correctly it enhances my instruction.</td>
<td>Stephanie Lancaster</td>
<td>Digital tools; Lesson Plans; Overwhelmed; Tech Improves Instruction</td>
</tr>
<tr>
<td>#3</td>
<td>I believe that personalized digital learning environments can truly enhance the instruction that occurs in the classroom. However, it should be used meaningfully and not added just to show the use of technology. When I first developed lesson plans using digital formats I would think of ways to use it in the framework; whether it should be used in the opening, mini-lesson, work session, or closing. Now, I feel that my lessons flow naturally using digital resources.</td>
<td>Stephanie Lancaster</td>
<td>Tech Improves Instruction; Digital Tools; Planning Digital Tools as Natural Fit</td>
</tr>
<tr>
<td>#2</td>
<td>We are having the kids create a Google Presentation for their “Dream Vacation on a $1000 Budget.” They have a whole host of decisions to make, calculations to produce, and ideas to share. It is hysterical watching them go from a round trip ticket in Barcelona to catching a bus in Richmond, VA.</td>
<td>Kristin Chambers</td>
<td>Google apps; Digital Tools; Student Choice; Student Driven</td>
</tr>
</tbody>
</table>
Data Analysis Processes and Procedures

The data in this qualitative, multi-case design study were analyzed through multiple analytical methods. In addition to analyzing data at the end of the data collection period, the researcher constantly reflected on the data throughout the collection period in order to inform and adjust the questions and conversations during the interviews, as well as the prompts for the participant-generated reflections.

The researcher used the constant comparative method of data analysis to analyze multiple data sources, including interview transcriptions, participant-generated journal reflections, as well as documents related to the purpose of the study. According to Corbin and Strauss (2015):

In doing constant comparison, data are broken down into manageable pieces with each piece compared for similarities and differences. Data that are similar in nature (referring to something conceptually similar but not necessarily a repeat of the same action or incident) are grouped together under the same conceptual heading. Through further analysis, concepts are grouped together by the researcher to form categories (sometimes referred to as themes). (p. 7)

Inductive analysis was used to compare similarities and differences so that concepts could be grouped together to form categories or themes (Corbin & Strauss, 2015). When looking for themes within the data, the researcher used “descriptions of the case and themes of the case as well as cross-case themes” (Creswell, 2013, p. 105). Through the use of within case analysis, the researcher framed the analysis by looking at each individual case (eight in total) as a separate entity, analyzing the data of the individuals first and then the within school cases. Within each case, comparisons were made. Once comparisons within each case were made, cross-case thematic analyses were conducted and assertions and interpretations of the meaning of the cases were made (Creswell, 2013).
Trustworthiness

With case study research, it is important to discuss the trustworthiness of the data collected and the findings reported. Lincoln and Guba (1985) argued that ensuring credibility is one of the most important factors in establishing trustworthiness. In fact, Lincoln and Guba (1985) chose the word “trustworthiness” to indicate the credibility or believability of a researcher’s findings from the research process. Maykut and Morehouse (1994) discussed the issue of trustworthiness by asking the questions, “To what extent can we place confidence in the outcomes of the study? Do we believe what the researcher has reported? (p. 145). It was determined that some of the ways researchers can ensure the trustworthiness of their research were to triangulate the data by using multiple methods to collect data, build an audit trail, collaborate with a team of researchers, and use member checks (Lincoln & Guba, 1985; Maykut & Morehouse, 1994).

It was critical for this study to be credible, valid, reliable, and trustworthy. In fact, many steps were taken to ensure the trustworthiness of the research. To begin, the case study received approval from the Institutional Review Board with the Cobalt County School District as well as the university associated with the study. All research processes and procedures abided by the moral provisions of these professional organizations. Additionally, the researcher frequently reflected on scholarly work on validity, reliability, and ethics to ensure the trustworthiness of the study.

In this study of teacher sense-making around personalizing instruction in digital learning environments, the researcher decided to employ the use of triangulation, member checks, a researcher reflective journal and debriefing with peers to ensure the trustworthiness of the data.
Through triangulation, researchers make use of multiple sources, methods, investigators, and theories to provide confirming evidence (Erlandson, Harris, Skipper, & Allen, 1993; Glense & Peshkin, 1992; Lincoln & Guba, 1985; Merriam, 2009; Patton, 1980). Moreover, Creswell (2013) stated that triangulation:

Involves corroborating evidence from different sources to shed light on a theme or perspective. When qualitative researchers locate evidence to document a code or theme in different sources of data, they are triangulating information and providing validity to their findings. (p. 251)

To triangulate the data, the researcher used interviews, participant generated reflective journals, and document analysis. By using these multiple modes of data, the researcher was able to ensure the validity and reliability of the findings.

When a researcher solicits participant perceptions of the credibility of the findings, it is called member checking (Erlandson et al., 1993; Glense & Peshkin, 1992; Lincoln & Guba, 1985; Merriam, 2009; Miles & Huberman, 1994). With member checking, “the researcher takes collected data, analyses, interpretations, and findings back to the participants to that they can judge the credibility of the account” (Creswell, 2013, p. 252). According to Lincoln and Guba (1985), “member checking is the most critical technique for establishing credibility (p. 314). In this study, the researcher used verbal member checks at the commencement of the second face-to-face interview. By allowing the participants to reflect on the collected data, analyses, and interpretations of the data, the teacher participants were able to add and/or omit responses, as well as to clarify any misinformation or misinterpretations of their comments. With almost three months passing in between the initial and follow-up interviews, the member checking process also served as a reminder to the teacher participants of the purpose of the study and the conversations had on the topic during the initial interview.
This process of member checking ensured that the conclusions drawn from the participant interview data were credible and trustworthy.

In addition to triangulation and member checking, the use of peer debriefing was used to increase the trustworthiness of the data. Merriam (2009) described peer debriefing as, “discussions with colleagues regarding the process of study, the congruency of emerging findings with raw data, and tentative interpretations (p. 229). Although there was only one principle researcher for the purpose of this study, peer debriefing was used by employing the expertise of the doctoral committee members, as well as the researcher’s small writing group, to develop and critique the data interpretation collaboratively and to ensure the credibility of the findings.

**Limitations of the Study**

In most qualitative research, generalizability in the statistical sense is limited by the use of small, purposeful samples (Yin, 2009). In this study, looking only at upper elementary teachers was another limitation. Additionally, the researcher was an employee of the school district in which data were collected. This factor may have limited the perceptions shared by the interviewed teachers that may have otherwise been shared with a researcher with no affiliation to the research site.

Another limitation to the study was its timing and length. This study lasted four months and was conducted during the spring semester. All of the upper elementary students at the four of the participating elementary schools were required to administer the new state standardized assessment to their students towards the end of the spring semester. This timing and length of the study may have limited the diversity of teacher experiences explored through the study.
CHAPTER 4

FINDINGS

The purpose of this study was to understand how elementary school teachers make sense of personalizing instructional practices in digital learning environments. Through interviews, participant-generated reflections, and documents, the study sought to answer the following research question: How do elementary school teachers make sense of personalizing instructional practices through digital means?

The participants in this study included eight upper elementary school teachers across four elementary schools within the Cobalt County School District. The four elementary schools selected for this study were representative of the demographics of the Cobalt County School District. Additionally, the four elementary schools selected participated in a one-to-one technology initiative. A qualitative case study design was used in which each participant was interviewed twice for approximately two hours. The researcher also collected participant generated journal reflections and various documents including lesson plans and student products. The constant comparative analysis method was employed to analyze data. As codes and categories emerged, the researcher gained clarity on sense-making while also uncovering several overarching themes.

The chapter begins with an overview of the context of the school district, a description of each school site, followed by a description of each participant. The chapter concludes with the presentation of the individual case findings from the four participating elementary schools and a cross-case analysis of the data obtained from the Cobalt County School District.
School System

Cobalt County (pseudonym) is small urban county located in northeast Georgia with an estimated 120,000 residents. During the 2014 – 2015 school year, the Cobalt County School District operated 21 schools: 14 elementary schools, 4 middle schools, 2 high schools, and a career academy. The Cobalt County School System served more than 13,000 students of which 7,197 students were at the elementary level. The school system student population of Cobalt County was 51% African American, 23% Hispanic, 20% White, 7% Multi-racial, and 2% Asian. The school district employed 1,038 teachers of which 755 held advanced degrees. The average number of years of experience of teachers was 12 years. In the Cobalt County School District, 78.1% of the students received free/and or reduced lunch pricing for the 2014-2015 school year.

During the 2014 – 2015 school year, the Cobalt County School District was a pilot district for digital learning environments in which all students in grades three through nine were provided a one-to-one digital tool (netbook, chromebook, or laptop) to use while at school. Additionally, students whose parents completed a training program were allowed to take the digital tools home each night. Students in 10th – 12th grades were encouraged to bring their own device (BYOD) to school and were provided access to Internet connection. All students in the Cobalt County School District were provided a free school district email address through Google.

Schools and Participant Profiles

Mt. Willow Elementary

Mt. Willow Elementary School (pseudonym) is a public elementary school in Cobalt County, Georgia serving grades Pre-K through 5th. Mt. Willow Elementary School is 1 of 14 elementary schools in Cobalt County. The school has 584 students and the demographic make up
consists of 50% African American students, 34% White students, 8% Hispanic students, and 6% Multi-racial students. The Mt. Willow Elementary School staff includes 52 highly qualified teachers of which 37 hold advanced degrees. The average number of years of teaching experience at Mt. Willow Elementary School is 11 years. At Mt. Willow Elementary School, 60.2% of the students receive free and/or reduced priced lunch based on their family’s income. The school boasts an innovative digital learning environment and provides all students in grades 3-5 with devices to support their learning outside of school. Table 4.1 provides an overview of the participating teachers from Mt. Willow Elementary School.

Table 4.1

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Years of Teaching Experience</th>
<th>Highest Degree Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridgette Johnson</td>
<td>4th/5th Grades Gifted</td>
<td>12 years</td>
<td>Ed.S. Children’s Literature Studies</td>
</tr>
<tr>
<td>Kristin Chambers</td>
<td>4th Grade General Education</td>
<td>18 years</td>
<td>M.A. Early Childhood Education</td>
</tr>
</tbody>
</table>

**Bridgette Johnson.** Bridgette Johnson was 12-year veteran teacher collaborating in both fourth and fifth grades and supporting students of the gifted program. Bridgette had completed her Bachelor’s degree in Middle Grades Education and her Master’s and Specialist’s Degree in Children’s Literature. She taught all 12 years in the Cobalt County School District, but gained experience in several different positions. For seven years, Bridgette was a sixth grade Language Arts teacher at one of the middle schools. During this time, Bridgette had the opportunity to work with students of all backgrounds and ability levels including students with disabilities,
students in the English as a Second Oral Language (ESOL) Program, and gifted students. For the following four years of her career, Bridgette taught fourth and fifth grade gifted students at Mt. Willow Elementary School. However, during the 2014-2015 school year, Bridgette taught fourth grade reading and math and also served gifted students in kindergarten as well.

**Kristin Chambers.** Kristin Chambers was an 18-year veteran teacher at Mt. Willow Elementary School with a Master’s degree in Early Childhood Education. During the 2014-2015 school year and two years prior, Kristin taught 4th grade general education. Prior to being a fourth grade teacher, Kristin spent 10 years as a resource or Early Intervention Program (EIP) teacher for students in kindergarten through fifth grades and 5 years as a second grade teacher. Kristin taught for 2 years in a neighboring county prior to teaching in the Cobalt County School District for 16 years.

**South Brookside Elementary School**

South Brookside Elementary School is a public elementary school in northeast Georgia serving grades Pre-K through 5. South Brookside Elementary School was built in 1923 and is 1 of 14 elementary schools in Cobalt County, Georgia. The school has 536 students and the demographic make-up consists of 44% White students, 40% African American students, 5% Hispanic students, 7% Asian students, and 4% Multi-racial students. South Brookside Elementary School has 43 highly qualified teachers with 33 having advanced degrees and an average of 11 years of teaching experience. Of the students at South Brookside Elementary School, 56.5% received free and/or reduced lunch pricing based on their family’s income. South Brookside Elementary School also claims an innovative digital learning environment and provides 1-1 technology and take-home devices to all students in grades 3-5. Table 4.2 provides a detailed overview of the teacher participants from South Brookside Elementary School.
Table 4.2

*Overview of South Brookside Elementary School Participant Profiles*

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Years of Teaching Experience</th>
<th>Highest Degree Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catherine Howard</td>
<td>1st/4th Grades Gifted</td>
<td>2 years</td>
<td>M.A.T. Early Childhood Education &amp; Special Education</td>
</tr>
<tr>
<td>Rebecca LeBlanc</td>
<td>4th Grade EIP</td>
<td>17 years</td>
<td>B.A. Early Childhood Education</td>
</tr>
</tbody>
</table>

**Catherine Howard.** Catherine Howard (pseudonym) was collaborative teacher of the gifted in both first and fourth grades at South Brookside Elementary School. Catherine had an undergraduate degree in Fine Arts, a dual Master’s degree in Early Childhood Education and Special Education, and an endorsement in Gifted Education. The 2014 – 2015 school year was her second year teaching. She had only been teaching for two years, both in the fourth grade and first grade gifted education in the Cobalt County School District

**Rebecca LeBlanc.** Rebecca LeBlanc (pseudonym) was a fourth grade teacher Early Intervention Program (EIP) teacher at South Brookside Elementary School. Rebecca was a 17-year veteran teacher with 11 of those years working in the Cobalt County School District. She had 7 years of teaching experience in upper elementary grades and 10 years of experience in grades kindergarten through third. Rebecca had a Bachelor’s degree in Early Childhood Education, an endorsement in Gifted Education, and was certified in kindergarten – 12th grades in Art Education with her undergraduate degree in Early Childhood Education. During the 2014 – 2015 school year, Rebecca worked specifically with fourth grade students who struggled academically in the content areas of Reading and/or Math.
**T. J. Johns Elementary**

T. J. Johns Elementary School is a public elementary school in Cobalt County, Georgia serving grades Pre-K through 5th. T. J. Johns Elementary School was built in 2009 and is 1 of 14 elementary schools in Cobalt County. The school has 561 students and the demographic make-up consists of 64% Hispanic students, 27% African American students, 6% White students, 2% Multi-racial students and 1% Asian students. T. J. Johns Elementary School has 49 highly qualified teachers, 37 of which hold advanced degrees, and an average of 9 years of teaching experience. At T. J. Johns Elementary School, 95.7% of the student body received free/and or reduced price lunch for the 2014-2015 school year. The school also provided all students in grades 3-5 with take-home devices and innovative digital learning environments. Table 4.3 depicts an overview of the participants from T. J. Johns Elementary School on Elementary School.

Table 4.3

*Overview of T. J. Johns Elementary School Participant Profiles*

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Years of Teaching Experience</th>
<th>Highest Degree Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bethany Albritton</td>
<td>4th Grade General Education</td>
<td>1 year</td>
<td>B.A. Early Childhood Education</td>
</tr>
<tr>
<td>Stephanie Lancaster</td>
<td>4th/5th Grades ESOL</td>
<td>8 years</td>
<td>M.S.W. Social Work</td>
</tr>
</tbody>
</table>

**Bethany Albritton.** Bethany Albritton (pseudonym) was a fourth grade teacher and had recently graduated with her undergraduate degree in Early Childhood Education. The 2014 – 2015 school year was her second year teaching. While she had only been teaching for two years, both in the fourth grade, Bethany had also completed her student teaching in the Spring 2014 in
the Cobalt County School District prior to being hired at T. J. Johns Elementary School.

**Stephanie Lancaster.** Stephanie Lancaster (pseudonym) was an English to Speakers of Other Languages (ESOL) teacher with eight years of teaching experience. During the 2014–2015 school year, she collaborated in both fourth and fifth grades. During this time, Stephanie worked along with the fourth and fifth grade teachers to serve students who were learning the English language. Each school day, Stephanie would work with fourth grade students for two 55-minute segments and with fifth grade students twice a day for 55-minute segments. During these segments, Stephanie would “push in” to the general education classroom to support ESOL students during reading and math instruction.

**Downs O’Brien Elementary School**

Downs O’Brien Elementary School is a public elementary school in northeast Georgia serving grades Pre-K through 5th. Downs O’Brien Elementary School is 1 of 14 elementary schools in Cobalt County, Georgia. The school has 578 students and the demographic make-up consists of 46% African American students, 9% White students, 40% Hispanic students, and 5% Multi-racial students. Downs O’Brien staffs 53 teachers of which 21 have advanced degrees and an average of 16 years of experience. Of the student population, 87.3% received free or reduce price lunch for the 2014-2015 school year. The school provided all students with one-to-one digital access at school, as well as a take home device. Table 4.4 illustrates an overview of the participating teachers from Downs O’Brien Elementary School.
Table 4.4

Overview of Downs O’Brien Elementary School Participant Profiles

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Years of Teaching Experience</th>
<th>Highest Degree Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patricia Lange</td>
<td>5th Grade General Education</td>
<td>10 years</td>
<td>M.A. Reading and Literacy</td>
</tr>
<tr>
<td>Tracey Kirsch</td>
<td>4th Grade General Education</td>
<td>6 years</td>
<td>M.A. Instructional Technology</td>
</tr>
</tbody>
</table>

**Patricia Lange.** Patricia Lange was a fifth grade general education teacher with 10 years of teaching experience. Patricia had a Bachelor’s degree in Early Childhood Education and a Master’s degree in Reading and Literacy. She taught all 10 years in the Cobalt County School District; 5 years as a second grade general education teacher and 5 years as a fifth grade general education teacher.

**Tracey Kirsch.** Tracey Kirsch was a fourth grade general education teacher with six years of teaching experience. She had a Bachelor’s degree in Early Childhood Education, a Master’s degree in Instructional Technology, and was certified as a Media Specialist in grades kindergarten–12th. Tracey’s experience varied among several age levels and positions including Pre-kindergarten general education, Pre-kindergarten Special Education, second grade general education, second through fifth grade science specials teacher, and fourth grade general education. At the time of the study, Tracey had been teaching in the Cobalt County School District for three years and had completed two and a half years of teaching upper elementary grades.
Within-Case Analysis

In analyzing the collected data during each individual teacher’s interview and open-ended journal responses, five unique findings emerged from each school case and the overall research question was answered. The five unique findings included: a) collective understanding of personalized learning, b) planning and preparation practices within a personalized digital learning environment, c) common instructional practices with personalized digital learning environments, d) supports and resources for implementation, and e) reflecting on successes and challenges.

While the constructed knowledge of personalized learning of each school case varied some, similarities among all four cases were determined. A genuine understanding of each school case’s understanding of personalizing instructional practices in digital learning environments emerged.

Case #1: Mt. Willow Elementary School

Both the initial and follow-up individual interviews with Bridgette Johnson and Kristin Chambers were held on-site at Mt. Willow Elementary School within their respective classrooms. Despite having taught all day, both teachers appeared to be genuinely excited to participate in the study and willing to share their experiences with personalized learning and digital tools. Both the initial and follow-up individual interviews lasted about one hour in length.

Finding 1: Collective Understandings of Personalized Learning

“Personalizing instruction varies from topic to topic, student to student, and even day to day. There are so many variables that affect instruction and its delivery model.” – Bridgette

At the start of both the initial and follow-up interviews, Bridgette and Kristin were asked to describe their understanding of personalized learning and how it looked in their classrooms at Mt. Willow Elementary School. As the participants shared their understanding of personalized
learning, four findings emerged from the interviews and documents including: (a) personalizing for students’ needs, (b) personalizing learning through interests and choice (c) personalized learning as student-driven and student-centered, and (d) personalized learning as differentiation.

**Personalizing for Students’ Needs**

“It’s finding out what they need and what’s the best way for us to get the information to them.” – Kristin

At Mt. Willow Elementary School, an emphasis on identifying the learning needs of students to personalize instruction was evident. In fact, Bridgette described her understanding of personalized learning as, “I think it is when you tailor what you do in your class to meet the needs of your students.” Kristin agreed that, “personalized learning is giving students what they need” and then giving “them [the students] material on that level.” Furthermore, Bridgette reflected on students’ needs as including the learning strengths and weaknesses of students. She questioned, “What are their strengths? Is it more language arts? Is it more math? Do we need to spend some time really working on certain skills that they can improve?” Kristin further explained that to personalize learning, “you’ve got a group of kids who need this skill, but you may have one or two students who need another skill, or you may have one student who just needs some – a specific skill. So you’re trying to pinpoint those things” in order to give “students what they need at their level.” Identifying the learning strengths and weaknesses of the students is an integral part in personalizing learning and providing students with instruction based on those needs.

Both participants indicated that to personalize learning, students’ instructional needs are determined through assessing the students in various ways. Bridgette reflected on how she used “pretest scores” and then determined the students’ learning needs based “on their strengths and their weaknesses.” Bridgette continued, “We talk about our strengths and weaknesses. And so
that helps me adjust my instruction.” In an effort to determine her students’ instructional needs, Kristin asserted, “I’m just observing and listening to the conversations. I’m going ‘okay,’ I’ve got to go back and grab this child and this child and this child because something’s gotten lost along the way.” From this information, Kristin personalizes her students’ learning experiences.

Results from interviews and journal reflections indicated that both teachers from Mt. Willow Elementary School would agree that personalized learning was providing instruction and materials to students based on their needs. Additionally, the participants from Mt. Willow Elementary School also believed that using information about students’ needs gathered from variety of assessment strategies was necessary to personalize instruction and lessons for students.

In the following sections, the findings discuss additional characteristics of personalized learning and elaborate on how teachers at Mt. Willow Elementary School used student information to deliver personalized instruction.

**Personalized Learning Through Interests and Choice**

“You differentiate your teaching, your projects, what they’re doing in class, not only to meet their needs but to also meet their interests” – Bridgette

In addition to addressing the learning needs of students, Kristin and Bridgette recognized that personalized learning should also include the opportunity for students to have their learning experiences tailored to their interests and be provided some choice in their own learning. Kristen shared in her initial interview that personalized learning also “allows us to tap into those [student] interests.” In a journal reflection, she also related the importance of allowing for student choice when personalizing learning for students as it pertained to her own learning. Kristin asserted, that to personalize learning, “I attempt to present options available to my students and let them make some choices about their education. I hate being told that I have to do something a certain way. Let me choose; I am a happy camper.”
Bridgette confirmed that personalized learning may also “be through interests where they [the students] get a lot of choice.” For example, she stated, “personalized learning can be where they have a menu of items and they get to choose what they do.” Bridgette further explained, “One of my goals as a teacher is to make learning enjoyable for my kids and keep them engaged” and so, “I try to give them a lot of choice. I ask them, “We’ve got to review. How do you guys want to do it?” Both Bridgette and Kristin recognized that in providing choice to personalize learning for the students, that learning could become more enjoyable and may increase student engagement.

**Personalized Learning as Student - Driven and Student - Centered**

“It makes them more in control of their own learning.” – Bridgette

In describing the shift in teaching practices that personalized learning encouraged in their classrooms, both Kristen and Bridgette agreed that the learning and instruction in a personalized learning environment was much more student-centered and student-driven. Bridgette described her understanding of her role in a personalized learning environment as, “There used to be a whole lot of me standing in front of the classroom. And now there’s a whole lot more of it being student-driven or student-centered.” In sharing her thoughts on personalized learning being student-driven, Kristin agreed that:

This allows my independent students to just run with it. I touch base with them and they are off to the races. Those that need a little push can get that and be off. And those that need more direct instruction can get that from the adults in the room or other students.

Both teachers shared that they believed personalized learning involves students being responsible for making informed decisions about their own learning and requiring less direction from the teacher.
Bridgette and Kristin both viewed teachers more as facilitators to the curriculum and less as the sole providers of knowledge in a personalized learning environment. In fact, Kristen shared that personalized learning has removed, “the teacher as the all knowing entity” and that “I learn from the kids, too.” Bridgette further explained that when she personalizes the learning experiences for her students, her students become “the planners and creators” and that “even though it was choice, I feel like I guided them.” Additionally, Bridgette believed that with personalized learning students should be “completely in control” and she, “wanted it be completely them. I think that was part of the experience.” With students being at the center and in control of their own learning, Bridgette stated, “I’m not just the one standing up in the room” and that personalized learning has allowed the classroom to be “less teacher-centered for sure.”

**Personalized Learning as Differentiation**

“Well, you differentiate your teaching, your projects, what they’re doing in class” – Bridgette

The words ‘personalize’ and ‘differentiate’ have very similar meanings when you search their definitions in a dictionary. Likewise, when asked to define personalized learning both teachers from Mt. Willow Elementary School indicated that they believed it was similar to differentiation. Kristin explained, “Personalized learning is giving students what they need at their level. I look at is as differentiation.” In fact, when asked how personalized learning looked in their classrooms, both teachers oftentimes used the terms interchangeably. Bridgette shared, “Personalized learning has a lot to do with differentiation. It has a lot to do with finding the interest of your students in your class and playing on those interests and moving forward with that, but at their own level or their own pace.” For example, Bridgette described, “I need to differentiate for various learners. I know my students. I know who they get along with and which standards they struggle and excel. I like to base my center groups on those key ideas.”
She agreed that to personalize learning for students, teachers must differentiate the instruction as well as the students’ work.

When discussing how she personalized learning, Kristin shared that she personalized learning in reading class using technology and, “links to things that maybe are differentiated a little bit” and using “leveled texts that is kind of circle, triangle, square...the ability grouping kind of thing.” Bridgette stated:

It would be best if you could do it [differentiate] for every student, and I think that’s the end goal…but usually it’s groups of students. It could be through interest where they get a lot of choice or it could be a tiered lesson.

Regardless of how personalized learning looked in their classrooms, both teachers believed that personalized learning and differentiation were similar and involved tailoring instruction based on the students’ needs and interests.

**Finding 2: Planning and Preparation Practices Within a Personalized Digital Learning Environment**

In both the initial and follow-up interviews, Bridgette and Kristin shared their planning and preparation practices for personalizing learning through the digital learning environment for their students at Mt. Willow Elementary School. As the participants shared their experiences and perspectives with planning and preparing to personalize learning for their students, two major findings emerged from the interviews and documents including: a) components considered while planning for personalized learning and b) the planning process for personalized learning.

**Components Considered While Planning for Personalized Learning**

“So, I look to see where we need to be headed. Then I have to consider the prerequisite skills needed to even start the journey.” – Kristin

Throughout the interview and journaling process, Bridgette and Kristin discussed several components they considered while planning to personalize learning for the students in their
classrooms at Mt. Willow Elementary School. The similar components considered by the two teachers when planning a personalized digital learning environment included the curriculum and standards, student needs and assessment data, student interest and choice, small group instruction, and digital tools. Finally, the teachers shared the process in which they used the various components while planning for personalized digital learning environments for their students.

**Curriculum and standards.** Both teachers at Mt. Willow Elementary School agreed that the state curriculum and grade level standards play an important role when they are planning their personalized instruction for students. The curriculum and standards tell the teachers what the students need to learn, know, and be able to do to meet the grade level expectations. Kristin shared, “When it comes down to actual planning, my first step is the curriculum guide. So, I look to see where we need to be headed.” The curriculum guide explains the various grade level standards by content that teachers are expected to teach students. Bridgette agreed that when she planned her personalized lessons, she considered “the curriculum guide and the Common Core standards in the unit of study. I think to myself, ‘How am I going to transform my students into experts on the standard I am teaching?’”

While the curriculum and grade level standards are an integral part of the planning process, these guides are not the only entities considered. Bridgette shared, “I look at the curriculum. We don’t always follow the standards completely, but I do look at the curriculum.” Both teachers agreed that understanding students’ prior knowledge and skills are also important factors to consider when planning for a personalized digital learning environment. Kristin noted:
So, I look to see where we need to be headed. Then I have to consider the prerequisite skills needed to even start the journey. For example, double digit multiplication. Do all my students have enough number sense to grasp the concept of place value, let alone multiplication? Through observations, discussions, and assessments, I pretty much know who is going to struggle with multiple digit multiplication and who is going to grasp that concept quickly.

While the state curriculum and grade level standards are an important factor of the planning process, both teachers determined that understanding the learning needs of their students was also imperative.

**Student needs and assessment data.** When planning for a personalized digital learning environment for their students, both teachers at Mt. Willow Elementary School shared the requisite to consider their students’ individual learning needs as a major component to the planning process. In fact, Kristin expressed the necessity to determine the students needs because, “you’re sitting there going ‘I’ve got 25 kids ranging from here to here – from the lowest of the low to the highest of the high.’” With so many needs in one classroom, Kristin admitted that planning personalized instruction is a challenge. However, Kristin explained, “If you don’t, you’re not truly getting them where they are and getting them where they need to be.” Bridgette asserted that considering students’ needs when planning to personalize instruction is essential as “when I just teach the standards, that’s the basics.”

Both teachers at Mt. Willow Elementary described planning personalized learning as a much more detailed process involving the collection of data on student learning. Bridgette and Kristin shared their approaches to collecting data on the learning needs of their students and then how they used this information to personalize learning for their students. Kristin shared that she assessed her students’ understanding mostly through “conversations with them and lots of observations.” Additionally, Kristin also shared, “I review benchmark scores” and “I also review math post test scores from the units of study...I choose the standards that the majority of the
students need to review.” From the data, conversations, and observations, she was able to
determine which students needed additional support or extension of the curriculum and then used
this information when planning her instruction.

Using student academic needs’ data informed the teachers on how they should approach
personalizing the curriculum and their instruction for students. Bridgette considered her students’
strengths and weaknesses when planning for personalized instruction. Bridgette stated:

I do look at the curriculum, and I think of their levels. I think, ‘What are their strengths?
Is it more language arts? Is it more math? Do we need to spend time really working on
certain skills they can improve?’ So, I think of that, too. I think that all goes into it.

However, her approach to collecting and analyzing the data varied some from Kristin in that she
allowed her students to analyze their own data. Bridgette explained, “We take a pre-test and then
I take the top 15 kids that scored the best on the pre-test. Then, we analyze our pre-test…with the
students.” After analyzing the information with her students Bridgette described, “we look at the
questions and we talk about our strengths and weaknesses. And so that helps me adjust my
instruction.” Bridgette detailed how her students played a vital role in determining their learning
needs by sharing:

As a class we talk about it and then individually, they may send me an email on what –
what do they think their strength is with this unit and [wherever] their weaknesses they
need to work on. And so from there, I can build lessons and personalize learning through
that.

Furthermore, Bridgette indicated that she attempted to use this data collection and analysis
process with her students for every unit in her curriculum. Once the students have analyzed their
own data and determined their learning needs, Bridgette is able to utilize information about her
students “strengths and weaknesses that they reflected upon and move forward” with planning
and preparing personalized lessons for her students.
Despite having slightly varied approaches to collecting and analyzing student data, both teachers from Mt. Willow Elementary School agreed that the use of students’ learning data was a critical component of the planning process when personalizing learning for students. This analysis of student data allowed for the teachers to gain a better understanding of each student’s individual learning needs. Kristin shared that personalized learning is not just planning to place “kids into groups based on their academic needs, but then also taking those academic needs and breaking it down to every individual student.”

**Student interest and choice.** The teachers at Mt. Willow Elementary School also shared when planning to personalize learning for students that in addition to the curriculum and students’ needs information, it is also important to consider how and what the students like to learn as well. Kristin shared that including ways to increase student engagement is also a factor during her planning process. She asserted, “During this process, I am also looking into ways to teach, remediate, and extend, all at the same time, without using old textbooks and worksheets. Can I get the concept across in a more authentic way?” Bridgette explained that when she planned, she also considered ways to increase student engagement and motivation; further, she elaborated, “Not only do we have to look at where they’re weak or where they’re strong, we have to look at where their interest lies.”

When planning personalized lessons, Bridgette shared how she collected information on her students’ interests and how best to provide choice to her students. She stated, “I could do a survey, and at the beginning of the year, we do spend some time really getting to know each other.” Bridgette further described how she planned for her students using the interest data collected on her students. Bridgette stated, “I take into account their interests and what keeps them engaged” and “I just know my kids….I build a good rapport with them at the beginning of
the year. We talk about what they do on the weekend and their interests and hobbies.”

Additionally, Bridgette shared that often she will ask her students how they want to learn or review a particular topic. In her second journal reflection, Bridgette wrote:

Reviewing can be really boring….The best compliment I can get is for a student to tell me that I make learning fun. So, not only do I need to make sure my students really ‘get’ the standards, I want them to have fun doing it. I asked the students how they wanted to review. We had a class discussion a few days before the review was going to take place. I simply explained to them what we need to review and asked them how they wanted to do it.

With her students’ interests and choices, students’ academic needs, and the curriculum in mind, Bridgette thoughtfully planned personalized lessons for her students.

Kristin also shared the importance of knowing her students’ interests and learning styles when planning for a personalized digital learning environment. She asserted:

I also look at students learning styles. Some students will work best with another student, some with an adult, and others don’t want to talk to a human at all, and yet others will need all of the above.

Furthermore, when planning her reading instruction, Kristin shared the importance of allowing students’ some choice in their reading material. She detailed how she provided choice to her students during their reading groups and that, “I presented two books…they chose.” Both Kristin and Bridgette used the knowledge of their students’ interests in conjunction with their students’ learning needs and the curriculum when planning their personalized instruction for their students.

**Small group instruction.** Both participants from Mt. Willow Elementary discussed that planning for small group instruction to personalize learning for students was important. The teachers at Mt. Willow Elementary School shared that having many students in a classroom can be a challenge. However, implementing a small group instruction model was the best way to personalize learning and address the needs of all of their students. Kristin shared:
Having 29 kids by yourself is – it’s hard. Because you still have to do some one-on-one stuff, but it may be more three-on-one as opposed to – because there just aren’t enough hours in the day…You do the best you can.

Kristin believed that planning small group instruction was necessary to “get those [students] down into small numbers so we’re hitting a lot more one-one-one to try and figure out where the gaps are” and while “each of those areas may be scaffold differently for each student or groups of students… I try to have us all heading in the same direction.” Bridgette also affirmed that when she plans her small, personalized groups, “I need to differentiate for various learners. I know my students. I know who they get along with and which standards they struggle and excel. I like to base my center groups on those key ideas.” Despite having different teaching roles at Mt. Willow Elementary School, both Kristin and Bridgette found planning for small group instruction to be a valuable means to personalize learning for their students.

When asked how she plans, Kristin shared that she primarily plans for small group instruction for her students based on their ability-level or skill-level. She stated:

“I’ve got this one, this one, and this one who do not need me to do any of this review…So there is extension and remediation. So it varies across the board based on the kid’s needs…There are some one-on-one…you’ve got small group… sometime ability-based learning.”

She also shared that she often times plans for students to work in groups based on their ability and other times based on the skills needed for them to master a particular standard or part of the curriculum. For example, Kristin discussed her leveled reading groups:

We have leveled a text that is kind of circle, triangle, square – that ability grouping kind of thing. But each person knows that okay, when I see that, I need to go to the circle or I need to go to triangle, or this week I want you to bump up to square and try to give them material that they need on that level.

From these assorted student groups, Kristin plans personalized lessons for the small groups based on their ability level or skills needed to master a particular concept or standard. Bridgette shared
a similar vision of how she plans for her small group instruction:

It look like centers that – where we rotate through where if you went to one center, it may be differentiated in that your work maybe a little harder than if I went to the same center. So, it’s kind of like differentiated centers.

Bridgette concluded that she plans small group lessons where “kids are working on different projects that I’ve assigned that are at different levels.” Both teachers at Mt. Willow Elementary agreed that planning for small group instruction to personalize learning was the best way for them to meet the learning needs of their students.

**Digital tools.** Planning for the use of digital tools to personalize learning in the classroom was determined as essential at Mt. Willow Elementary School as Kristin shared, “technology is used all day, every day” as “we are fortunate to have the one-to-one technology, so they [students] all have their laptops and they’re all doing their netbooks.” Both teachers at Mt. Willow Elementary believed that the use of technology has transformed planning for personalized learning, making the planning and implementation process easier for teachers and resources more accessible to students. Kristin voiced, “Technology has allowed us to quickly make learning more accessible, more specific.” Just as the students are using digital tools for learning, teachers are also using digital tools to plan and implement lessons for their students. Bridgette shared, “I do feel like I am constantly combing the Internet for new things.”

Both participants from Mt. Willow Elementary School shared the effects of the access to technology and digital resources on their planning process. Kristin stated:

Prior to all of this, you sat in your room and you wrote out what you were going to do and you figured it out and you put it in your lesson plan book and nobody looked at it…now, I can be sitting at home on the back porch on a Saturday afternoon, shoot an email to somebody going ‘What are we going on Monday for this, this, and this?’ And the next thing you know, we’re having a full conversation to be able to plan and not having to sit in a room together to do that.”
Bridgette shared that by planning with technology, she is also able to collaborate more easily and share ideas with other teachers. Kristin stated, “I’m more avid and more out there with sharing with everything.” Kristin also agreed that collaboratively planning lessons with other teachers was much easier through the use of technology. She shared:

Collaboration is a whole lot easier…we can come up with lesson plans and link in the different worksheets or websites or anything along those lines that we find to go along with it and then we can pick and choose.

Both teachers felt that using technology for the purpose of collaboratively planning was a strength for Mt. Willow Elementary School. Kristin asserted, “We’re doing a really good job collaborating within our buildings with the technology.” However, with the access to the technology, both teachers wished to have more collaboration for planning across buildings within the school district.

Kristin also shared how her lesson plans were also digital and accessible to teachers, students, and parents through a website. She stated:

One of the things I do is my website and every week we have everything, any presentation that we do, any PowerPoint, any Smartboard, anything along those lines is connected on that so that way the kids can access it.

Kristin discussed how planning with digital tools and sharing her lessons through her website has “made it more accessible” and that “you don’t have to tote the world home with you.” Kristin explained how she no longer had to carry around teacher edition books for each content area and that many of the resources for planning were now digital. She stated, “It’s freed us up to where I just – I got my computer and I can access it anywhere and I can sit at the beach and create vocabulary cards.” Kristin chose to use a website because, “This technology stuff does help get us organized, and once it is organized, it is much easier to review and remember.” Furthermore, Kristin explained, “We can archive this stuff from year to year…saving lesson plans and ideas.
The database just keeps building.” With a growing database and access to lesson plans and digital resources, both Kristin and Bridgette felt that the planning process and collaboration amongst teachers was becoming much more manageable.

Bridgette and Kristin both shared that allowing students to use digital tools during their personalized small group instruction, “lightened the load.” Both Mt. Willow Elementary School teachers agreed that because the students were engaged in learning through the digital tools, it made engaging in small group instruction with a group of students easier and more manageable. In fact, Bridgette admitted that she included in her lesson plans to use digital tools during the small group center time in her classroom for these reasons. She shared:

I think where we had centers, they were almost all technology based, so I had one center where they would review…So I feel like they were more technology based and I think I did that, one – because it would keep them engaged, and two – it was a little bit easier than having to create worksheets and things like that for me.

Kristin also believed that the use of technology was helpful in planning and managing personalized small group instruction. Kristin further explained:

Back in the day…I would do small groups, but yet management of those small groups sometimes would be – if I am working with a group of five and I have 20 kids who are supposed to be working on different things, things escalate.

Both Kristin and Bridgette revealed how using the digital devices during small group work time “freed” them from managing behavior and allowed them more time to focus on providing students with personalized instruction based on their various needs.

In addition to having to plan instruction based on the state curriculum and grade level standards, Bridgette and Kristin shared that with the implementation of using digital devices for learning that they also had to teach students various digital skills along the way. This required additional planning and instructional time. Bridgette expressed how many students “can’t type to save their life. Some of them can’t navigate Google Drive.” She continued that “Sometimes you
try to weave it in,” but other times certain digital skills or digital resources require more explicit instruction and practice. For example, Kristin shared, “We had to take a great deal of time teaching and exploring the format of the test, since we were taking the Milestones on our computers…we knew we needed some time to manipulate that environment.” When discussing having to teach the students certain digital skills including online testing taking, she went on to add, “sad that we had to take time to do such things, but such is life.”

**The Planning Process for Personalized Learning**

“There are so many variables that affect instruction and its delivery model, it is hard to give a standard formula, but there is a process or method to the madness.” – Kristin

It was determined that both Bridgette and Kristin considered similar components when planning for a personalized learning environment for their students. From the interviews and journal reflections, it was found that the curriculum and standards, student needs and assessment data, student interests and choice, small group instruction, and the role of technology were all key factors in the planning process for personalizing learning in digital learning environments. While the components considered in the planning process were similar, how the two teachers at Mt. Willow Elementary School approached the planning process did vary in some ways.

According to Kristin, the state curriculum was considered the first step in the planning process. Kristin shared that to begin their planning, she started with the curriculum and finding the standards that the students needed to learn for each specific unit. She asserted:

> When it comes down to actual planning, my first step, unfortunately, is the curriculum guide. I wish I could say that I look at each child’s needs first, but let’s face it. We just can’t do that anymore. So, I look to see where we need to be headed.

While Bridgette did not fully disagree with Kristin’s initial planning step, she did waiver some between beginning with the curriculum and also starting with the interests and needs of the students in mind. In her first journal reflection, Bridgette stated:
My process for planning any lesson, specifically a personalized digital lesson begins with the student. How do my learners learn the best? What are their strengths? How independent are they? What motivates them? What do they need to know and understand? Then I move to looking at the curriculum guide and the Common Core standards in the unit of study. I think to myself, ‘How am I going to transform my students into experts on the standard I am teaching?’

Here Bridgette articulated that she begins her lesson planning process with her students’ learning styles and strengths first. Then, she moves on to the curriculum. In her initial interview, she also stated, “And after I think of their interests and what keeps them engaged, I look at the curriculum.” However, in her second journal reflection, she explained her planning process with, “First, I spend time figuring out which standards to review.” Here she states that she began with the curriculum and standards in mind when planning for activities to review standards that were previously taught. While Bridgette may not always have used the curriculum as her initial step in planning process, she did see it as valuable for her to understand what the students “needed to know and understand” early on in the planning process.

Once the standards for the unit were identified, then Kristin shared, “I consider the prerequisite skills needed to even start that journey.” She used students’ formative assessment data and “observations and conversations” to make judgments about how to proceed with providing instruction to the students. After the standards were determined for Bridgette, her next step was also to consider the students’ learning needs. She, too, used formative assessment data including “pre-tests” to identify what the students already knew about the topic and then determined where they needed to go to meet grade level expectations. Bridgette felt that lesson plans, such as these, were the most personalized “in that I knew my students strengths and weaknesses.” Both teachers used the students’ needs information to determine which students required remediation or extension of the curriculum being covered within a unit of study.
Additionally, Bridgette and Kristin shared that the formative assessment data was used to inform the teachers of which students should be placed together in small groups according to their academic needs for a more personalized approach to instruction.

Following the use of formative assessment data to determine their students’ learning needs, Bridgette and Kristin exhibited varying opinions and options as to what should come next in the planning process for personalized learning. Kristin’s described a possible next step in the planning process was to design her instruction to create small groups with personalized instruction and lessons. She shared:

At that point, I have to start looking at the resources available; including people…Some students will work best with another student, some with an adult, and others don’t want to talk to a human at all, and yet others will need all of the above and then some.

While Kristin believed her next step in the process was to form small groups or centers for personalized learning, Bridgette preferred to identify which digital tools and resources would be used in the lesson, then create her groups for personalized instruction. She stated, “Finally, I investigate digital tools I am interested in using and differentiate for my learners.” Bridgette also shared that when she considers digital tools for her instruction, it is important to her to find “digital tools that could fit into the classroom. I wanted digital tools that would motivate and engage my students.”

Subsequent planning for digital tools and technology resources, Bridgette would then plan small groups and centers to personalized learning for her students. Bridgette shared that she planned for students to “break in to groups and focus on the standards that we needed to review.” Kristin would first create her small groups or centers and then would consider in what format she wanted to present the information for her students. She would consider what resources were available including “manipulatives and technology.” Kristin also shared that during this part of
her planning process, she also took into consideration her students learning styles and allow them “to make choices” in their learning. She shared:

Once I have an idea of who needs what type of scaffolding, what projects, activities, assignments, worksheets, etc. we will be attempting within a week, I think about how I am going to get this information to the students in the best possible way. I post everything we do on my website.

During this phase of her planning process, Kristin searched for digital tools and electronic resources that would connect with the students’ interests and learning styles in each respective group and provide them with choice. Kristin shared, “Technology has allowed me to present multiple options to my students.”

The final step of the planning process was reflection. Both Bridgette and Kristin shared their reflection practices and how their reflections inform their planning processes. Bridgette voiced:

As the students are learning, I think about what is going well and what I could do differently next time. Upon reflection, I might share my lesson with a colleague and talk about what worked or what didn’t and gain insight from them about what I could do next time.

Kristin also shared that after implementing a lesson she planned, she would reflect on the lesson. During the reflection phase of the planning process, she would think back on her instruction and consider “tweaking things and learning from – okay, you know what? That one didn’t work. Let’s modify that. Let’s tweak this.” She then would spend time figuring out how to make the instruction more engaging and personalized, and then the process would begin again.

While the teachers from Mt. Willow Elementary School provided a process order for how they personalized learning in digital learning environments for their students, both Bridgette and Kristin expressed uncertainty with how and when technology fit in to the planning process. Kristin questioned, “Sometimes its like ‘Am I using the iPad because we have them or is it
because it makes the task – which is coming first? The technology or the task?” While both teachers shared the need to begin their planning process with identifying the curriculum and standards, they both indicated that there were also times in which they planned lessons around a particular digital resource or digital tool. Bridgette explained:

Sometimes, I have to say this, but it’s the other way around. I really want to use this today, which – example, Kahoot. So, how am I going to do that? And that may be a backwards way of planning, but sometimes I do it that way.

Bridgette described an instance where she planned her instruction around a digital tool and her students’ interests and then considered the curriculum and students’ needs. She stated, “My kids love the competition aspect of the online Kahoot game.” Additionally, she added, “My students love working on their net-books and I knew this was a great activity to review fraction standards.” Here Bridgette started with the knowledge of a digital tool, Kahoot, and her students’ interests of online competition and using their netbooks for learning. Bridgette went on to say, “For my final step of planning, I needed to differentiate for various learners,” and she further explained:

I also was able to create different Kahoot games based on ability. Some of my students are experts when it comes to adding, subtracting and multiplying fractions. I was able to really push my high students and challenge them while playing an advanced Kahoot game.

Both Bridgette and Kristin shared that there were times in their planning when they would design their personalized instruction and small groups around a digital tool. However, they also both indicated the need to begin with the curriculum and students’ needs as initial steps in the planning process as well.
Finding 3: Common Instructional Practices with Personalized Digital Learning Environments

In both the initial and follow-up interviews, both teachers from Mt. Willow Elementary School shared their common instructional practices with personalizing learning through the digital learning environment for their students. As the participants shared their daily instructional practices, experiences, and perspectives with implementing personalized digital learning environments for their students, three findings emerged from the interviews and documents including: a) small group instruction, b) student driven learning, and c) digital tools for personalized instruction.

Small Group Instruction

“Organized chaos is the best description for my classroom. At any given moment, you may see students working independently, with a partner or in small groups.” – Kristin

Throughout the interviews and journal reflections, both Bridgette and Kristin described their classroom instructional practices with personalizing learning in digital learning environments. The Mt. Willow Elementary School teachers discussed that on a daily basis students worked in differentiated, small groups, and centers. Bridgette explained that to meet the needs of her students, she would differentiate her instruction and assignments for her various learners. She shared, “I know my students. I know who they get along with and which standards they struggle and excel. I like to base my center groups on those key ideas.” Student groupings in both of the teachers’ classrooms at Mt. Willow Elementary School were determined by using a variety of student data including students’ assessment data, student interest and learning style information, and student choice. Kristin confirmed that in her math class, she and her co-teacher “break our kids into smaller groups” and each teacher takes a group to deliver small group instruction based on their academic learning needs, interests, and learning style. She further
explained:

Those that have pretty much mastered the concepts, they’re going this way. We’ve got another group going over here. We’ve got another group going – but we get those down into small numbers so we’re hitting a lot more one-on-one to try to figure out where the gaps are.

Bridgette also confirmed a majority of her instruction takes place in small groups and differentiated centers. She explained, “It can look like centers that – where we rotate through….it may be differentiated in that your work may be a little harder that if I went to the same center. So it’s kind of like differentiated centers.”

Kristin emphasized that while some students are working with their hands, other students were engaged in learning on their digital devices for research or working on computer programs to practice a skill that was previously taught. Kristin also explained that she often used technology through her classroom website as a means to organize the small groups’ reading instruction and student assignments. She specified:

We have leveled texts that is a kind of circle, triangle, square, that ability grouping kind of thing…each person knows that okay, when I see that, I need to go to the circle or I need to go to triangle, or this week I want you to bump up to square and give them material that they need on that level.

To access their leveled reading material, the students were able to access the website through their school issued digital devices.

Bridgette confirmed the use of technology and online digital programs as a major component in her small group instruction as well, stating:

I have created different kinds of Kahoot quizzes based on student levels. So I would be in charge of Kahoot quiz so when they rotated around their centers, when their group came to me I would know what skills they needed to work on and I would pull up the correct Kahoot quiz.

Furthermore, Bridgette described how allowing students to used their digital devices “keeps them more engaged.” She stated, “I know that every kid loves Kahoot, so I’m going to
start off with a Kahoot because that’s going to get them engaged.” Additionally, Bridgette stated that she also often used “different games that they can play based on the skill they need to work on, on the computer” as a way to keep the students motivated and excited about their work within their small groups. More specifically, Bridgette sent a variety of games to the students in her small groups based on their “weaknesses on the fraction standards.” She then created several Kahoot games based on her students varying abilities. Bridgette stated, “some of my students are experts when it comes to adding, subtracting and multiplying fractions. I was able to really push my high students and challenge them while playing an advanced Kahoot game.”

While types of resources varied from classroom to classroom, both teachers at Mt. Willow Elementary School used student digital devices and digital tools as a means to provide personalized instruction, differentiate students’ work in the small group setting, and engage students in their learning.

**Student-Driven Learning through Interests and Choice**

“It’s just more personalized, more student centered.” – Bridgette

A common instructional practice that both Kristin and Bridgette employed was allowing students to “make some choices about their own education” in order to personalize their learning experiences. Bridgette acknowledged, “It seems like lessons that were personalized and geared towards their interests were a success.” For example, she shared:

We were looking at real world issues and it was when Ebola had just really – all over the news, read articles. And so my students decided that they wanted to write and direct and star in a movie, like a – it was supposed to be a documentary but there was a little narrative in there. And so that’s what we did.

Bridgette explained that she allowed the students to take control of the direction of the project. They “brainstormed a whole list and the minute the move idea, they were like ‘Yes.’” Throughout this student-driven project, the students in Bridgette’s class used various digital tools including
Movie Maker, iPads, and their netbooks to research information about the Ebola epidemic. Bridgette felt that this type of learning experience was “authentic” and “real world.” She also felt that “it was differentiated because every kid had a different role. They did what they were comfortable with.”

Kristin shared that she also preferred to present learning experiences that were “more open ended, choice driven, project based.” She did indicate that she wasn’t able to do as many of these types of projects as she liked, but that this type of teaching was “more in line with her philosophy.” As an example of this type of instructional practice, Kristin shared that she had, “the students create a Google presentation for their Dream Vacation on a $1000 Budget.” With this project, the students had “a whole host of decisions to make, calculations to produce, and ideas to share.” With this project, the students were able to learn about budgeting and calculating travel costs from “a round trip ticket to Barcelona to catching a bus in Richmond, Virginia.” Furthermore, Kristin offered insight into other student driven projects that involved students making “Teach It” videos for Math. The students were able to choose a math skill and “develop a lesson to teach that skill” to the students who would be moving up into their grade level the following school year. Kristin further detailed, “We try to do as many projects as possible and having the technology at our finger tips greatly improves the quality and quantity of these projects.”

**Digital Tools to Personalize Instruction**

“*Technology has allowed me to present multiple options to my students.*” – Kristin

While a variety of activities and instructional strategies were used within their small group instruction each day, both Kristin and Bridgette noted using digital tools and resources for assessment, instructional tools, and the production of student work. Furthermore, the teachers
indicated that the students used their digital devices often and that “technology was used daily” in their classrooms. Bridgette shared that she tried to incorporate technology often in her instruction because, “I feel like they are engaged a lot more and they love their computers.”

Kristin also agreed the use of technology has “made us connected, productive, and at times creative.”

One digital tool often used by the teachers at Mt. Willow Elementary School was the use of digital assessment programs that provided instruction to students and student assessment data to teachers. Kristin shared that she often used computer programs that monitored student academic progress in her small group instruction. She shared:

I have five kids over here and these five over here are working on some kind of hands-on writing something…and these five over here are on their computers doing Ten Marks or SuccessMaker or something like that and these five over here are researching.

Computer programs like Ten Marks and SuccessMaker adjust to the performance level of the students. They also provide teachers with a comprehensive report of how the students are performing in particular subject areas like math and reading. Bridgette also discussed her use of digital websites that would assess students’ knowledge. She shared her frequent use of digital tools called Kahoot and NearPod. Kahoot is a competitive and interactive digital website that allows teachers to create quizzes. Students are able to select multiple-choice answers from their computers and the highest achieving scorers are projected onto the main screen in front of the classroom to generate competition and excitement. The students’ responses are also shared with the teacher. In addition, Bridgette explained that NearPod was also an interactive “assessment tool” similar to Kahoot for students “except for you can insert your whole lesson into it.” She further detailed, “you can have a few slides about common denominators and then you can insert a question and al the kids answer and you see all their answers.” This provides the teacher with
feedback about how students are learning throughout a lesson. With NearPod, the students “are really engaged” and it can be differentiated for a variety of learners.

Kristin shared how she used digital tools for delivering instruction to the students. She explained that she shared websites, links, videos, songs, and games through her classroom website and the students’ accessed this information from their school issued digital devices. Furthermore, Kristin stated that when she is providing instruction to her students that she presented “all options that could include a few websites, a few worksheets, and an activity to do with a partner or with a teacher.” Kristin asserted, “One nice thing was having all those sites, links, etc.” on her classroom website. Kristin further explained, “All I had to do was point the kids to the week we were discussing a certain topic and go from there.” Bridgette also used digital tools to deliver instruction in her classroom. Bridgette shared about an “authentic and personalized” lesson in which she used digital tools for her students called Mystery Skype. She explained:

Basically what you do is Skype call another class, and I usually try to set it up – if we’re fourth grade, I try to set it up with another fourth grade class. We don’t know where they are and they don’t know where we are and we have to ask them yes or no questions. Usually it’s 10 questions to figure out where they are. It incorporates map skills. It incorporates teamwork because the class has to work together. We learned a lot about our geography, not only of Georgia, but of the whole United States. Map skill. We learned a lot about Georgia just in case they asked us for facts.

Bridgette went on to share that they spent several weeks preparing for this Mystery Skype by researching online about map skills. She also detailed that “I divided them into groups, and they all have different roles.” One of the roles included Googlers, which were responsible for accessing Google for information during the Skype session. Additional student jobs that Bridgette shared included “map masters that were in charge of maps” and “somebody photographing or videoing the whole thing.” Furthermore, the students also “rotated through
questions and answers. So when they asked us a question, there was somebody in charge of answering.” Bridgette explained that they used digital tools and this Mystery Skype experience to use map skills, time zones, and Georgia studies. Both Bridgette and Kristin used a variety of digital tools to provide instruction to their students through websites, songs, games, and applications.

In addition to assessment and instruction, Bridgette shared she used digital tools to allow her students to create products that reflected their learning on a given topic. For example, she shared about a grant proposal she drafted for her school to receive a 3-D printer. She explained that she allowed her students to select a problem they were having at school in which they could use a 3-D printer to develop a product that may impact the problem. The students brainstormed and voted on what problem they wanted to investigate further and they narrowed it down to the school water fountains being gross and germy and students not wanting to drink from them. Then, the students started thinking about how they could use a 3-D printer to create something that would impact their identified problem. After she received the funding for the 3-D printer, Bridgette detailed:

We have our 3-D printer. And so this past week, my students learned how to use Tinkercad and they all designed their own spout or contraption that they could put on the end of the water fountain. And they had to persuade the class to pick theirs, why, so we incorporated persuasion, and then they voted on the top three. Because we talked about how in real life if you’re part of a company doing a proposal, not everybody get chosen…So the top three were chosen and today, we started printing them. So we printed the first one this morning. It takes awhile. It’s like a 45-minute thing to print a little one. And we’re going to print the rest and we’re going to try them out and talk about how – why they work, why they don’t, what we could do differently next time.

Bridgette and Kristin both used digital tools in various ways in their classrooms. Kristin shared that her students often created digital products such as presentations and videos to teach other students about concepts they were studying in their classrooms. For example, Kristin detailed “In
years past, during our weather unit, the culminating project was a written weather report. Now, we can write the report, record it over a green screen.” Then, students are able to share their weather report and the knowledge they have gained from the weather unit virtually with others all over the world. Kristin shared that “or ability to share, collaborate, and document” through digital tools has transformed the way teachers provide instruction. Kristin felt, “we can create, share and learn from people all over the world, not just our own backyard.” This has increased the students’ abilities to generate and to create innovative and unique products that reflect their learning and problem solving capabilities.

**Finding 4: Supports and Resources for Implementation**

Throughout the initial and follow up interviews and journal reflections, Bridgette and Kristin shared various supports and resources for implementing personalizing learning through the digital learning environment for their students at Mt. Willow Elementary School. As the participants shared their experiences and perspectives on the use of supports and resources to personalize learning for their students through a digital learning environment, three major findings emerged from the interviews and documents including: a) role of the media specialist and instructional technologist specialist, b) professional learning opportunities, and c) teacher needs to improve implementation.

**Role of the Media Specialist and Instructional Technology Specialist**

At Mt. Willow Elementary School, there was a media specialist assigned to a building. Additionally, there was one instructional technology specialist who was assigned to serve Mt. Willow Elementary School teachers and several other schools. The instructional technology specialist was required to split their time amongst all of their assigned schools to support teachers with the use of technology in the classroom. The teachers from Mt. Willow Elementary
School found the media specialist and the instructional technology specialist to be very helpful and supportive with implementing use of digital devices for personalized learning.

Both Kristin and Bridgette found the media specialist at Mt. Willow Elementary School to be very knowledgeable of personalized digital learning and was also easily accessible to teachers when needed. Kristin explained that the media specialist worked collaboratively with the teachers and was very supportive in helping teachers to implement digital tools and skills in the classroom. She stated that during their collaboration, he often would share a new digital tool or say, “here is a new program” for teachers to try in their classrooms. Bridgette agreed that the media specialist was a great resource for using digital tools in the classroom. She stated, “he’s a superstar” and “I steal stuff from his blog.” Furthermore, Kristin discussed a digital skills “scope and sequence” that was being developed by the media specialist at Mt. Willow Elementary School to ensure that students learned and achieved certain digital skills from one grade level to the next so that teachers were informed of the progressive technology skills students should possess.

Bridgette desired to have an instructional technology specialist at each school so the teachers would have more support with implementing the use of digital tools in the classroom. Bridgette described her collaborative partnership with the instructional technology specialist assigned to their school. She shared that she worked alongside the instructional technology specialist to write “a grant proposal for Donor’s Choose” for a 3-D printer for the students to design and create products. With the collaboration between Bridgette and the IC, the project was funded. According to Bridgette, the instructional technology specialist was flexible and willing to help as he was “only supposed to be here one and a half or two days a week” but that “if you say you need him, he will fit you in and he just bounces back between all the schools.” She felt
that she used the “tech person” and that he was instrumental “with the 3-D printer.” Furthermore, Bridgette confirmed that the instructional technology specialist assigned to Mt Willow Elementary would “come and teach lessons” to her students and also meet with her to “go over ideas” for ways to incorporate technology into her instruction. Bridgette wished that “other teachers would embrace the use of technology more in the classroom.” She felt that is a instructional technology specialist were assigned to one building that it would help teachers to feel more comfortable with using digital tools. She asserted, “Right now our tech experts are pulled in so many directions, it is hard.” This has created some resistance from teachers to try using innovative digital tools in the classroom.

**Professional Learning Opportunities**

When asked about the professional learning opportunities offered to teachers on personalized digital learning environments, both Kristin and Bridgette indicated that they had not had any formal training at Mt. Willow Elementary School or through their school district. In fact, Bridgette confirmed, “I have not taken a class on personalized digital learning environments this school year.” Throughout the interviews and journal reflections, the teachers from Mt. Willow Elementary School shared that much of their professional learning was self-initiated through researching websites, blogs, and scouring Twitter for innovative digital tools. Bridgette shared the need to continue to learn about digital tools in education. She shared, “Technology keeps changing. What was cool this school year will be outdated next year and something will replace it. Therefore, I need to keep learning.”

Bridgette indicated that a majority of the professional learning on personalized digital learning environments she had was through her own Internet search and research of digital tools through her own desire and initiative. Bridgette shared that in addition to web searches, she also
liked to “participate in tech discussions on Twitter and read technology blogs when I have the
time to get new ideas.” Thus, much of the teacher’s professional learning was teacher initiated.
Bridgette exemplified the idea of teaching initiated professional learning. She shared, “I have
made a conscious effort to learn about using technology in the classroom.” For example,
Bridgette stated:

I love infographics, but I do not know how to create one. One of my goals this summer is
to explore various websites like Canva.com to aid my teaching. I also want to investigate
technology to incorporate into my lessons. For example, I just stumbled upon a QR code
generator that allows you to attach a voice recording to the QR code. I need to brainstorm
ways to incorporate this amazing tool!

Bridgette felt that a teacher’s initiative played a large role in staying abreast of various digital
tools and how to implement them in the classroom.

In addition to their own research on digital tools, Bridgette and Kristin indicated that they
also were able to attend several technology conferences as well. When asked about her
professional learning experiences on personalized digital learning, Kristin shared that she
attended “lots of conferences.” For example, she attended the Google Summit in Atlanta. She
explained that she “went there, learned a whole lot of cool stuff” and then she was responsible
for “bringing that back and redelivering” the information on personalized learning and
technology to the staff at Mt. Willow Elementary School.

Bridgette confirmed how she also attends technology conferences as a way to stay up to
date with innovative technologies to implement in the classroom. She shared, “I make an effort
to attend at least one technology conference each school year and I am on the tech team at my
school to deliver professional learning to other teachers.” In addition to the Google Summit,
Kristin also shared the opportunity of attending the International Society for Technology in
Education (ISTE) Convention. Kristin described her experience with attending the districts
“Summer Institute” where she was able to see “what other teachers were doing in their classrooms.” Kristin shared that her use of her classroom website to shared documents, resources, and materials with her students and parents was an idea inspired by one of her professional learning sessions. She stated, “It was one idea from that meeting or that class that sparked something else.” Both Kristin and Bridgette shared that they were a part of Mt. Willow Elementary School’s technology team. Part of this responsibility included redelivering any information they learned at the conferences with other teachers in the building. Bridgette stated, “I have gone out of my way to attend technology conferences” and then shared, “my knowledge with other teachers through individual conferences or professional learning.”

**Teacher Needs to Improve Implementation**

When discussing the resources and supports for teachers in implementing personalized learning in digital learning environments, both Kristin and Bridgette identified several teacher needs for better implementation within their classrooms. The most commonly identified teacher needs found were: a) time to research, plan, and implement the use of innovative and engaging digital tools to personalize learning, b) vertical alignment of digital skills for students by grade level, and c) collaborative planning across the district by grade level and content areas.

First, both Kristin and Bridgette desired more time to research and plan innovative, engaging, and personalized lessons. However, they did not feel that this was a possibility. Kristin asserted, “Time is a major factor that comes into play.” She described feeling frustrated because much her “most creative ideas” had to be “cut short due to time restrictions.” She wished for more time to plan and implement the innovative use of digital tools to personalize learning for her students in the classroom. She detailed the desire to have “time for me to explore and for me to gain the knowledge and time for me to digest that knowledge so that I can put it in kid terms.”
Another desire identified by Bridgette and Kristin was the vertical alignment of tech
skills for students by grade level. Bridgette shared her desire for the school district to develop
“technology standards” by grade level. She explained that with a vertical alignment of
technology standards each grade level would have certain digital skills the students should
master. For example, Bridgette asserted, “By the end of kindergarten, this is what they
learn…this is what they should be able to do.” Kristin agreed with having grade level technology
standards to ensure that students in each grade level gained “experience and exposure” to using
technology for learning. She explained how students’ digital skills experiences vary and having a
curriculum with grade level standards would help to level the playing field as “you have some
kids who have been able to do that since infancy and others who are learning it today.”

Kristin also desired the opportunity to plan collaboratively with teachers in her grade
level across the county to get ideas on how to personalize learning and use digital tools in the
classroom. She stated, “I would like to be able to sit and talk with teachers” at another school in
the school district and talk about “what’s working out there.” She wanted to be able to ask other
teachers, “What are you doing? Oh, we’re doing this over here” to gain ideas on how to improve
her personalized digital learning environments in her classroom. She further explained that at one
professional development she had attended, she had to sit with teachers from another school and
discuss practices that were working in your classroom. Kristin indicated, “I learned more from
that 30 minutes than I did the whole six hours we were sitting there.” She went on to describe her
desire to have the opportunity to “talk and to play with things” and “be able to have
conversations with colleagues” to bounce around ideas for using digital tools for instruction in
her classroom.
Finding 5: Reflecting on Successes and Challenges

Both teachers from Mt. Willow Elementary shared their successes and challenges with personalizing learning through the digital learning environment for their students. As the participants discussed their positive and challenging experiences and struggles with planning, preparing, and implementing personalized learning for their students, three major findings emerged from the successes with personalized digital learning environments including a) increased collaboration and connections b) increased student motivation and engagement, and c) increased access to information. Additionally, the teachers from Mt. Willow Elementary School also discussed the challenges with personalized digital learning environments. From these discussions, four findings emerged including: a) pressure to use digital tools, b) too much screen time, c) when technology fails, and d) student misuse of technology.

Successes with Personalized Digital Learning Environments

“Collaboration is a whole lot easier.” – Kristin

When discussing their positive experiences and successes with implementing personalized digital learning environments, Bridgette and Kristin reflected on how the collaborative planning process had gotten much easier among the teachers with the access to digital tools. Kristin stated, “Prior to all of this you sat in your room and you wrote out what you were going to do and you figured it out and you put it in your lesson plan book and nobody looked at it.” She also explained how she now has the capability to be sitting at home and work through email and other digital programs to collaboratively plan lessons for her students. She said, “And the next thing you know we’re having a full conversation to be able to plan and not having to sit in a room together.” Kristin detailed, “We can put the lesson plans and link in different worksheets or websites” into the digital lesson plan. She also described how any of the
teachers and administrators could access the lesson plans. She explained, “I’ve got my computer and I can access it anywhere.”

Bridgette also felt that the access to digital tools had improved the ability for her to collaborate with other teachers. Bridgette explained how she felt, “more comfortable now sharing with others and teaching other teachers about what you do to personalize digital instruction.” She went on to explain how she was more “avid and more out there” to make connections with other teachers and to share and receive ideas. In fact, toward the end of the school year Bridgette explained how she felt comfortable presenting and sharing information with teachers at her school.

In addition to being able to collaborate and connect with other teachers, Kristin and Bridgette also agreed that the use of personalizing instruction through a digital learning environment increased student engagement and motivation. Bridgette reflected, “I think where the digital learning comes in is more than keep them engaged.” Kristin shared that when she asked her students to write, they were more motivated and engaged in producing their writing because it is through the use of technology. She explained that prior to having digital devices, having students write about their weekends using paper and pencil was a “laborious task.” However, with digital tools students are producing “a paragraph within 15 minutes.” Furthermore, Kristin asserted that, “They’re completing the assignment and to a better quality.”

Bridgette also believed that the use of digital tools to personalize instruction had positively impacted her students’ motivation and engagement. She asserted, “I think it definitely engages all kids a lot more than just pencil and paper and other things we could do.” Bridgette described, “They are definitely motivated. When I got thank you letters at the end of the year, it was all about you incorporated technology or we always used the computer.” Bridgette felt that
the learning activities that were personalized and used digital tools were among her students favorites. She stated, “They were definitely motivated by it and eager.”

Along with collaboration, motivation, and engagement, the teachers of Mt. Willow Elementary Schools also deemed the students’ increased access to digital resources as a success of personalized digital learning environments. Kristen believed that through the use of their digital tools, students had “access to so much information.” She explained how prior to the one-to-one digital devices, the students used books and “a textbook is just going to have this much.” However, the Internet provides numerous digital resources and access to research for students. For example, Kristin described how students used to have to go to a book like an encyclopedia for research. But, now they can “YouTube and you can watch a video on the Battle of Lexington, a reenactment of the Battle of Lexington.” She believed that the access to the one-to-one digital tools has made it “a lot easier to get into that information.”

**Challenges with Personalized Digital Learning Environments**

“You better be using technology. That’s what they are looking for.” - Bridgette

Throughout the interviews and journal reflections, Bridgette and Kristin highlight a few challenges they had with implementing personalized digital learning environments. To begin, both teachers from Mt. Willow Elementary School felt some pressure to use technology in the classroom at different times. When district level coaches and administrators would conduct observations in classrooms, they felt that their students should be using their digital devices for instructional purposes. In fact, Bridgette conferred:

I will tell you when those walk-through people come and we know they’re coming, we make sure we’re using technology just because we know they’re going to be here, not because it’s the best thing for our students on that day.
Bridgette expressed worry, “I feel like they’re going to mark us down for not using it when we probably used it the day before.” Bridgette also explained that she also felt that her principal was a “big proponent” of personalized digital learning and so his love for it “kind of trickles down.” But, she also asserted that she desired not wanting to use technology “every single day” and the students become apathetic or so sick of the technology that they are no longer engaged by anything else.

While Kristin did not feel she was “forced to use” the digital devices everyday, she did indicate that “there are very few times that you won’t see a kid on their computer in here.” She did share that the message from the administration during district observations was, “It would be really nice if the computers were actually in use at that time.” However, Kristin never felt pressure to use digital tools in her classroom. Toward the end of the school year, there was a feeling of less pressure to use technology to personalize instruction all day everyday. Bridgette confirmed:

I do not feel that way anymore but I think the reason I don’t feel that way is because they have seen me do so much technology. They know. They know and trust me and they know I’m going to do that. But if they didn’t know me or trust me or realize that I do that, then I would feel stressed.

Kristin, too, felt that her administration trusted her and knew that she was using digital tools to personalize her instruction for students.

In addition to feeling the pressure to use technology for personalizing instruction, the teachers at Mt. Willow Elementary School also expressed a concern with too much screen time for students. Bridgette asserted, “I do worry about overuse. Or too much screen time for them.” This stems from the notion that technology is used “all day every day” and that the students are “on their computers most of the day” shared by Kristin. Additionally, Kristen shared concerns, as she believed that technology could not replace a teacher. She questioned, “Are we ever going to
be replaced by a computer solely? I can’t foresee that in my lifetime.” Bridgette agreed and believed that, “I just think we need to watch how much screen time and how much we use it.” Both teachers discussed seeking a balance between face-to-face and hands-on learning activities and the use of digital tools to personalize learning for their students.

Another challenge discussed by Bridgette and Kristen was when the technology failed. The students at Mt. Willow Elementary School were allowed to take home their school issued digital devices. However, some of the issues that Bridgette was having with this were “those days when some kids leave their computers at home or they’re dead.” The teachers discussed how frustrating it was because they oftentimes would plan lessons involving the students using their digital devices. If the technology was broken, unavailable, or if the Internet was not working then the teacher was forced to come up with a backup plan. Bridgette stressed, “There are kids that come where their battery does not work and they’re not lying and I have to make sure I have backup plans.” Furthermore, Bridgette continued, “So I feel like that is one tweak I’ve had to make is to make sure I always have backup.” Both teachers propounded that having to have a back up plan sometimes felt like more work.

Another challenge of the students’ one-to-one digital access to personalize learning was found to be the students’ misuse of the technology and the difficulty teachers had with being able to monitor the students. Bridgette discussed a situation where the students were using Padlet Wall, a digital site where students could post digital sticky notes to type their responses to a question and all of the students’ work shows up on the teachers’ screen in the front of the classroom. Bridgette described “They were supposed to write their names and then an answer. Well, a lot of the them used nicknames.” She furthered detailed that during this lesson one of the students began writing unkind things about another student under his or her nickname and other
students begin to respond and join in stating “Oh, I agree, I agree.” Bridgette struggled because she was unable to figure out which students were misusing the digital tool. She explained that she had to stop the lesson and told the students that what they were doing was bullying and if they could not use the tools properly then they would lose them in her classroom. She detailed, “the whole lesson turned into a bullying lesson and we didn’t use technology for a whole week.”

Kristin described similar situations with students misusing the digital tools. She shared how one of the female students began emailing one of the boys in her classroom. Kristin explained, “one of our boys opened up his email and there were 10 messages from a lovely little girl in the room who wanted to let him know that she liked him.” Additionally, students were able to bypass filters that had been set to protect students during their searches on their digital devices. Kristin shared that the access to digital tools has been “a blessing and curse.” While technology has opened doors for students to the world, it has also “opened doors into areas that some of our babies are not developmentally ready to go into.” Both teachers shared that the students’ access and use to digital tools was success, but sometimes could also be a challenge.

**Case #2: South Brookside Elementary School**

Both the initial individual interviews with Catherine Howard and Rebecca Le Blanc were held on-site at South Brookside Elementary School. Catherine’s initial and follow up interviews were held in a conference room at the front of the classroom. Rebecca’s initial interview was in her classrooms following the school day. Despite having taught all day, both teachers appeared to be genuinely excited to participate in the study and willing to share their experiences with personalized learning and digital tools. Rebecca’s follow up interview was held at an off site location following the end of teacher post-planning. This was because Rebecca Le Blanc’s family was relocating to another school district, and she was no longer an employee of the
Finding 1: Collective Understandings of Personalized Learning

“The activities and the lessons are tailored more for the child’s needs more than based on more rigid standards.” – Rebecca

At the start of both the initial and follow-up interviews, Rebecca and Catherine were asked to describe their understanding of personalized learning and how it looked in their classrooms at South Brookside Elementary School. As the participants expressed their understanding of personalized learning, two findings emerged from the interviews and documents including: a) personalizing for students’ academic needs and b) personalized learning through student choice.

Personalizing for Students’ Academic Needs

At South Brookside Elementary School, there was a clear emphasis on identifying the learning needs of students to personalize instruction. Both Rebecca and Catherine expressed their beliefs about personalized learning. Rebecca indicated that she felt personalized learning was when “the activities and the lessons are tailored more for the child’s needs more than based on more rigid standards. And also where the student can go through the curriculum at a pace that’s more for their learning style.” Catherine agreed that personalized learning was “differentiated lessons” and adjusting “the pacing of it” for students. Furthermore, Catherine shared that personalized learning to her was using “the standard we have to teach and then thinking how – what – and especially in my case, how to extend.” Both Catherine and Rebecca shared those understandings based on their students’ needs. Rebecca confirmed that to personalize learning, students would be “working at different paces, working on different levels.” To address the
students needs to personalize learning, Rebecca stated that she was “accelerating the curriculum or extending the curriculum or you’re maybe slowing it down a little and reviewing.”

In discussing their understandings of personalized learning, both teachers at South Brookside Elementary School agreed that using data was part of the process to personalize learning for the students. To determine the students’ needs and personalize learning for students, both Rebecca and Catherine explored the use of pre- and post-assessments. Rebecca indicated the use of assessment to personalize as well stating “You give a pre-test and you can see the student already knows how to do a lot of things, why go over those again if you can go on and move ahead and push along?” Furthermore, Catherine agreed in using “pre-test scores” as a way to personalize for her students. She stated, “I try to think about the students’ strengths and where they are and where they need to be pushed.” Results from interviews and journal reflections indicated that both teachers from South Brookside Elementary School agreed that personalized learning was providing instruction and materials to students based on their needs. Additionally, the participants from South Brookside Elementary School also believed that using students’ needs information gathered from pre- and post-test assessments was necessary to personalize instruction and lessons for students.

In the following sections, the findings illustrate additional characteristics of personalized learning and elaborate on how teachers at Mt. Willow Elementary School used student needs information to deliver personalized instruction for students.

**Personalized Learning Through Student Choice**

Both teachers from South Brookside Elementary School considered student choice to be an important consideration for personalizing learning for their students. Rebecca articulated, “Personalized learning to me is structuring the curriculum so that its more tailored to the type of
learner the child is, and giving the student choices and more buy-in. “Furthermore, she saw personalized learning as “a way to make them more involved in their own learning.” Catherine agreed that she often would personalize her students’ activities by providing them with “more choice” by choosing “their own topic based on the standards.” Furthermore, Catherine also allowed choice through letting her students select which “digital media program” they wanted to use to reflect their own learning.

Rebecca shared another important consideration of student choice in personalizing the learning environment for her students. She stated that “I have several who like to just kind of work by themselves, and I have others who need to work in small group because they have a hard time focusing.” Thus, Rebecca not only personalized through student choice with “different activities they could choose” but also with her students’ learning groups. Regardless of how personalized learning looked in their classrooms, both teachers believed that personalized learning involved tailoring instruction based on the students’ needs and interests.

**Finding 2: Planning and Preparation Practices Within a Personalized Digital Learning Environment**

*All of my lesson plans begin with a Georgia Curriculum Standard. I break down the standard into key vocabulary and think about the learning outcomes for the students.* – Rebecca

In both the initial and follow-up interviews, Catherine and Rebecca revealed their planning and preparation practices for personalizing learning through the digital learning environment for their students at South Brookside Elementary School. As the participants shared their experiences and perspectives with planning and preparing to personalize learning for their students, two major findings emerged from the interviews and documents including: a) components considered while planning for personalized learning and b) the planning process for personalized learning.
Components Considered While Planning for Personalized Learning

Throughout the interview and journaling process, Catherine and Rebecca discussed several components they considered while planning to personalize learning for the students in their classrooms at South Brookside Elementary School. The similar components considered by the two teachers when planning a personalized digital learning environment included curriculum and standards, student needs and assessment data, small group instruction, and digital tools. Finally, the teachers emphasized the process in which they used the various components while planning for personalized digital learning environments for their students.

Curriculum and standards. Both teachers from South Brookside Elementary School indicated the importance of using the state curriculum and standards as a part of the planning and preparation to personalize learning for students. Catherine shared that when she plans for personalized instruction, “I think of the standards we have to teach.” In fact, both Catherine and Rebecca agreed that the state curriculum and standards are the first component that they consider when they plan for personalized instruction. Rebecca stated she plans for personalized learning “through the curriculum” and that “all of my lessons start with a Georgia Curriculum Standard.” During this process, Rebecca explained that she breaks down the curriculum and standards she is preparing to teach “into key vocabulary” and then thinks about the “learning outcomes for the students.” Regardless of how the two teachers at South Brookside Elementary School Elementary use the curriculum while planning for their personalized instruction, both determined that the curriculum and standards are a key component of the planning and preparation process.

Student needs and assessment data. An important component of the planning process for personalized learning is to assess students’ knowledge to determine their learning needs. This data informs the teacher what the students need to learn in order to meet grade level standards.
Catherine explained her process for personalized learning and that she used her students “pre-test scores” for each unit and “goes from there.” Furthermore, she considered her students’ strengths and weaknesses to determine “where they are and where they need to be pushed.” Catherine clarified, “I take that into consideration when I’m coming up with lesson plans.”

Rebecca also used “pre- and post-tests” to monitor her students understanding and to determine what the students need to be learning next. She suggested that if a student already knew much of the content, “why go over those again if you can go on and move ahead and push them along?” An additional assessment strategy she used to inform her instruction was to “ask questions” and have conversations with her students to “try to find where they student is and how we can push them.” In addition to “formative and summative assessments,” Catherine also used “observations” and conversations with her students to assess their understanding and considered this information when she planned her personalized instruction.

**Personalized learning through small group instruction.** Both teachers at South Brookside Elementary School were specialized area teachers serving students with specific learning needs who qualified for their services. Due to their respective positions, both Catherine and Rebecca deemed small, flexible groups for personalized instruction to be an important component. Catherine argued that forming small groups for her instruction was imperative as she had “a small number of students” who performed significantly higher than other students in her classroom. She detailed, “I have a co-teacher and we split the group, so I have 1 group that has 12 students in it.” Planning for small group instruction, Catherine stated, “I feel like it’s easy for me to personalize for them because they’re such a small group and they can really challenge each other.” Rebecca indicated that “small group instruction” was used to address her students “different levels of leveled texts or activities based on where they are in the stage of learning.”
Catherine also noted using small group instruction in her classroom. She detailed that her personalized learning groups were fluid and that “each group changes slightly” based on student performance data. Catherine imparted, “sometimes we have kids joining the extension group or enrichment group” based on their assessment data. Catherine further detailed that the students within each small group are “often doing the same thing together” and that their lessons and activities are designed based on the group’s learning needs. Students are placed into groups and the personalized instruction varies by each group’s learning needs.

**Digital tools.** Another important component in planning and preparing for personalized digital learning at South Brookside Elementary School was the use of digital tools. Rebecca stated that after she identified the standards she needed to teach and assessed her students’ strengths and weaknesses; Rebecca then tried to find “digital resources that will help the students reach those learning goals.” In fact, she said, “My best source is just searching the internet.” Catherine also used digital tools to plan and prepare for her personalized instruction. She shared:

During planning, I researched online, characteristics of trustworthy websites then made a list to share with my students. I then researched further to find examples of “good” and “bad” websites. I added the URL’s for 6 different websites to a Google Document then shared the document with my students. This document would be used later during implementation.

Catherine shared that much of her students’ work is digital. She shared that when she plans, “I do think about if I have something that everybody needs to fill out” or if her students need to access a resource to complete an activity. She furthered, “I’ll sit and think –’okay, do I need to print this or can I just share it as a Google Doc? So it makes me think a little bit more about how I get the information to them.” Catherine mentioned that while planning she would often search for digital tools and sites to personalize her students’ learning. For example, she detailed, “I’m just able to find websites for simple machines and put it on a Google Doc for the students who
are researching simple machines.” Catherine also confirmed that digital tools was an essential component for her planning as many of her students, “use their computers every day because a lot of their research is online.” Rebecca shared her process for planning with digital tools in mind. In her initial reflection, she wrote:

We follow a mandated structure for planning lessons. Each lesson must incorporate and opening (starting the lesson to get the kids excited about what they are doing or to get them thinking), a mini lesson (the actual instruction), the work session (a time for the students to practice the new skill and the closing (an activity at the end to assess what the students learned). I try to incorporate some type of digital activity into one of these areas each day. For example, I might have an interactive game projected on the board as the opener. During the mini lesson, I could show an instructional video from Khan Academy. The work session might include an assignment using Google Presentation to create a report or research project. Finally, the closing could include an activity like Wordle so students can reflect on what they know.

While they used technology in different ways within their classrooms, both Catherine and Rebecca found that digital tools were a necessary component in personalizing learning for students.

**The Planning Process for Personalized Learning**

It was determined that both Catherine and Rebecca considered similar components when planning for a personalized learning environment for their students. From the interviews and journal reflections, it was found that the commonly used components considered while planning at South Brookside Elementary School included curriculum and standards, student needs and assessment data, personalizing through small, flexible groups, and digital tools. All three of the components were key factors for both Catherine and Rebecca in the lesson planning process for personalizing learning in digital learning environments for students within their respective classrooms. While the components considered in the planning process were similar, how the two teachers at South Brookside Elementary School approached the planning process did vary in some ways.
Rebecca believed that her first step in planning for a personalized digital learning environment was to identify the standards she wanted to teach her students. She indicated, “All of my lesson plans begin with a Georgia Curriculum Standard.” The standards direct the teacher on what the students should know, understand, and be able to do by content and grade level. Rebecca indicated this was her first step in her planning process. Catherine agreed that when she plans and prepares for personalized instruction, she starts with “a particular standard.”

The next step in the planning process, according to Catherine was to consider “if we have a pre-test – looking at that. If there is a group that we feel is ready based on their pre-test scores” then she would personalize and extend the instruction for those students.

After Catherine completed her analysis of her student needs data, she began to consider which digital tools she could use to implement personalized instruction. She wrote:

During planning, I researched online characteristics of trustworthy websites then made a list to share with my students. I then researched further to find examples of “good” and “bad” websites. I added the URL’s for 6 different websites to a Google Document then shared the document with my students. This document would be used later during implementation.

Rebecca’s next step in the planning process was also to identify the digital tools she wanted to use in her lessons. She wrote, “I then try to find digital resources that will help the students reach those learning goals. My best source is just searching the Internet.” Rebecca explained that she found it was “easy for me to think about how I incorporate technology” into her planning process for personalized digital learning.

Following identifying digital tools, Catherine plans her personalized instruction by separating her students into small groups. Specifically, planned her small group instruction “by separating the students into the 6 different groups.” Rebecca also followed planning her technology with forming her small groups based on her students’ academic needs. She asserted
that she had “kids struggling with the underlying concepts” and “needed a little outside help.” Once her students’ needs were identified, Rebecca found a digital tool, Xtra math, which “is a timed, individualized math fact practice that helps kids build essential skills they'll need to move on to more advanced math concepts.” From this information, Rebecca was able to form her student grouping and then planned “small group work with those needing the background work to help them with the strategies.” Both teachers at South Brookside Elementary School shared that they used their curriculum, assessment data, and digital tools to form their small group instruction.

Finding 3: Common Instructional Practices with Personalized Digital Learning Environments

“I think about how I grew up and how people talk about the old days where it was very much this is the lecture, this is what we’re doing today, you all do the same worksheet and then we move on. And I feel like now that’s not the way we teach.” – Catherine

In both the initial and follow-up interviews and journal reflections, both teachers from South Brookside Elementary School shared their common instructional practices with personalizing learning through the digital learning environment for their students. As the participants shared their daily instructional practices, experiences, and perspectives with implementing personalized digital learning environments for their students, three findings emerged from the interviews and documents including: a) differentiation and b) digital tools for personalized instruction.

Differentiation

Both Rebecca and Catherine believed that one common instructional practice they used to personalize instruction for their students was through differentiation of the content, the learning process, and the product that is developed to reflect the students’ learning. Rebecca shared:
Every lesson plan has to include some type of differentiation where you’ve either – you’re showing how you’re accelerating the curriculum or extending the curriculum or you’re maybe slowing it down a little and reviewing, maybe previewing the curriculum with students. And then allowing children to move at a pace that’s more of their own level.

The teachers at South Brookside Elementary School felt that differentiation could be approached several ways including student needs, student choice, and pacing.

Rebecca discussed that she used “differentiated lessons” and altered “the pacing” of the learning for her various learners. Rebecca described how she would tailor the lessons and activities based on her students’ needs rather than “rigid standards.” Furthermore, she explained that she also used differentiation as an instructional practice “where the student can go through their curriculum at a pace that’s more for their learning style.” As an example, Rebecca explained, “I use Google Classroom and I put the activities in these kinds of levels.” Rebecca detailed:

“They call it NAPE, N-A-P-E. The first level is novice. So if you finish the activities at this level, you’re considered a novice in this area. And then if you move, then you can on to the next more difficult level and if you finish that, you’re now an apprentice in that particular standard. And then the third level is practitioner and the fourth is expert. And some students never make it past a practitioner level, but a practitioner level is meeting the standard.

Rebecca continued to discuss how she differentiated based on the pacing needs of her students and that all of the students begin at the novice stage, unless that “based on their pre-tests” some students “get to move ahead” to the next level.

In addition to adjusting the pace of the lesson or learning activity, both Catherine and Rebecca indicated that they differentiated through evaluating their students’ specific learning needs and then tailored the activities to the groups of students. Rebecca agreed that, “a lot of times it would be students working at different paces, working on different levels.” She further explained, “The standards and everything would be the same for everyone “ but the students
would have different activities to complete based on their academic needs and pacing. For example, Catherine detailed, “As we go through a unit, and particularly math, the students are catching on quickly. Sometimes we have kids joining the extension and enrichment group. Just based on the work they’re doing in class.” Students are allowed to move in and out of differentiated small groups based on their understanding and performance on their standards.

Catherine further explained:

   Sticking with math, this higher-level group, I would start with the math- a particular math standard and so if they’ve mastered everything, sometimes [I’ll] take it a little bit further with them on that particular standard.

This extension of a particular math standard is just one example of how Catherine and Rebecca personalized learning for their students through differentiated activities and groups.

   Finally, another way the teachers at South Brookside Elementary School chose to differentiate the learning for their students was through providing choice to students. When describing the personalized instructional practices in her classroom, Rebecca said:

   You would see students having different activities, different choices of activities. There would be some whole group instruction and some small group instruction. Some maybe rotations in centers where they have different things to choose from and then different levels.

Rebecca focused on providing different activities for her students to choose from to enhance their learning. Catherine also used differentiated activities for students to choose to complete to reflect their learning. She shared, “they have a menu and they have to complete three activities” such as “a tic-tac-toe or there might be a basket and it has different folders with different things that they can try.” Both teachers at South Brookside Elementary School used differentiation strategies in their small groups to personalize learning for their students.
Digital Tools for Personalized Instruction

Both of the teachers at South Brookside Elementary School believed that the use of digital tools to personalize learning was essential. Catherine shared that she used a variety of online resources to support her students. She explained:

For instance, through email and the use of Screencast-O-Matic, I provided guidance for an assignment I was unable to be present to explain. The students were able to watch the instructions, discuss together then work independently or with a small group to complete the assignment.

Rebecca shared that she also uses many digital tools to support her students and personalize the instruction for them. Rebecca wrote in a journal response:

I might have an interactive game projected on the board as the opener. During the mini lesson, I could show an instructional video from Khan Academy. The work session might include an assignment using Google Presentation to create a report or research project. Finally, the closing could include an activity like Wordle so students can reflect on what they know.

Catherine believed personalized digital learning to be “beneficial” and supportive the learning of students. For example, she “was able to quickly respond to student work while they worked on a Google product such as doc or slides.” Catherine felt that the use of the digital tool allowed her to provide quick feedback to a student and helped to improve the student’s work.

Other digital tools for instructional purposes that the teachers at South Brookside Elementary School used for personalizing instruction included apps, movies, emails, and websites. Rebecca shared that she used technology for instruction every day. She stated that “99% of the people in the building put all their lesson plans on Google slides,” and we can “embed links” as well as videos and digital games into the Google slides. The slides are shared with the students and are projected on the screen in the front of the classroom each day. Additionally, Rebecca shared, “I send them movies and I send them emails,” and “I send them websites they can go to just kind of get a head.” Catherine used a Google application called
Google Classroom for presenting information to her students. This application allowed for her students’ digital materials needed for learning to be organized in one central location.

Rebecca explained how some of her students who struggled with reading and sentence structure often used a digital tool called Google Read and Write to generate their stories or written responses. Catherine described the app as:

“It’s kind of like an app or something. It’s embedded into the Google Drive and they can go on there and it will interpret text for them as they type. They can speak and it’ll type what they’re speaking.”

Furthermore, the students can “use it to read back what they’ve typed so they can hear. If they type something out, it’ll read it back to them.”

Furthermore, student often use digital tools to generate a final product to reflect their learning on a particular standards. Rebecca discussed, “We have done everything from typing and writing papers on just basic word processing, all the way to creating big presentations with lots of video and bells and whistles.” In both cases, students are manipulating technology to generate a product that was reflective of their understanding.

**Finding 4: Supports and Resources for Implementation**

“Another great source for digital tools and resources are our Media Specialist and our Instructional Technology support person. Both are up to date on all of the latest Apps, sites, and tools that are most useful for classroom instruction.” – Rebecca

Throughout the initial and follow up interviews and journal reflections, Rebecca and Catherine shared various supports and resources for implementing personalizing learning through the digital learning environment for their students at South Brookside Elementary School. As the participants shared their experiences and perspectives on the use of supports and resources to personalize learning for their students through a digital learning environment, three major findings emerged from the interviews and documents including: a) role of the media
specialist and instructional technology specialist, b) professional learning opportunities, and c) teacher needs to improve implementation.

**Role of Media Specialist and Instructional Technology Specialist**

Both teachers from South Brookside Elementary School indicated how valuable of a resource the media specialist and the instructional technology specialist were at their school. In fact, Rebecca wrote in her initial journal entry:

> Another great source for digital tools and resources are our Media Specialist and our Instructional Technology support person. Both are up to date on all of the latest Apps, sites, and tools that are most useful for classroom instruction.

With the new implementation of one-to-one technology for their students, Rebecca and Catherine indicated feeling some pressure to incorporate digital tools into their instructional practices. In fact, Rebecca shared that her biggest change in her teaching practice with the implementation of personalized digital learning environments is “how to incorporate the technology.” To help with this change, Rebecca shared that she worked closely with the media specialist housed at South Brookside Elementary School and the Instructional Technology specialist that was assigned to the school a few days each week. One of the roles of the media specialist and instructional technology specialist is to collaborate and support the teachers in making sense of how to implement new digital tools into the classrooms.

Rebecca discussed the support of the media specialist at South Brookside Elementary School. Oftentimes, the teachers and students will work closely with the media specialist on special project using digital tools. Rebecca indicated, “Our media specialist is fantastic.” Catherine seconded this notion stating, “He keeps up with all the new programs.” She continued, “He always does, a couple of times a year, different professional learning with us on new innovative things that we can use these computers for.” Catherine agreed sharing, “He’ll teach all
of us about some of the new programs.” For example, the media specialist works closely with our teachers and “they do a lot of Skyping with authors and experts in different fields.” For instance, she stated, “The fifth graders, they have to do these career portfolios and they Skype a lot with people who are professional in different fields.” Furthermore, Catherine shared that the media specialist would “lead discussions” and “offer some kind of session where he’s teaching us about something digitally.” Catherine and Rebecca indicated that their media specialist played a vital role in their professional development on implementing personalized digital learning.

Rebecca indicated that another support or resource for the implementation of digital tools in the classroom is the instructional technology specialist. She summarized, “He’s a resource in the building and then he will also do professional learning.” Rebecca also shared that oftentimes the teachers will be shown a digital tool by the instructional technology specialist that is “really engaging for the kids and we really want to try it.” However, the instructional technology specialist is not as easily accessible as the media specialist as the “tech person” only “comes every Wednesday.” She further explained, “e’s very willing to help, sometimes I think we forget he’s up there and then he can only come on Wednesdays.” Catherine agreed, “He’s here at least once a week to help out. And there have been a couple of times during staff meeting where he has presented new software that’s come out.” Rebecca talked about how there were many times that she and other teachers wanted to seek the support of the instructional technology specialist, but its not on the correct day of the week and by the time they see him again, she said “it’s too late.” Unfortunately, Rebecca stated, “We forget that we have that resource” due to the inconsistent schedule and lack of easy accessibility. While Rebecca and Catherine felt the instructional technology specialist was a support for implementing digital tools to personalize instruction, but they also felt his lack of accessibility made it difficult fully tap into his expertise.
Rebecca felt that the teachers at South Brookside Elementary School had great support and access to resources for digital tools for implementation, but that “time is a factor.” Both Rebecca and Catherine indicated that if supported was needed from the media specialist or the instructional technology specialist that it was important to “get on his schedule and find the time to do it.” With the implementation of one-to-one technology for students and a push for implementing personalized learning through digital means for teachers, the media specialist and instructional technology specialist were in high demand and not always easy to schedule.

**Professional Learning Opportunities**

Both of the teachers at South Brookside Elementary School indicated that they had not had any formal professional learning on how to implement personalized digital learning within their classrooms. However, both Catherine and Rebecca indicated that most of their learning on personalized digital learning environments came from the sharing of their media specialist and instructional technology specialist, collaboration with other teachers, and initiating their own learning and discovering new tools by playing with them.

Catherine shared that “during our staff meetings, we usually have something to talk about digitally” and that “our media specialist will often do that.” She indicated that most of the informal show-and-tell type professional learning came from the media specialist housed at South Brookside Elementary School. She shared that in addition to sharing new digital tools at faculty meetings, the media specialist at South Brookside Elementary School would also often include updates or “messages” about innovative technologies in the school’s daily newsletter sent out each day by the main office. She stated that the media specialist at her elementary school “does send us emails and lets us know try this or maybe just an introduction to a new tool.” While she hadn’t had any formal training on personalized learning with an emphasis on using
digital tools, Catherine did reflect, “I’ve had it piecemeal with things like staff meetings or stuff.” Due to this, Catherine indicated feeling somewhat supported with her own implementation.

Both Catherine and Rebecca felt that they learned a great deal about how to implement digital tools to personalize their instructional practices by collaborating and sharing ideas with other teachers within their school. In fact, Catherine shared that she often worked closely with another teacher who had earned a degree in technology and “ask questions sometimes” or would go to her for support on how to use a particular digital tool. Rebecca agreed that oftentimes she would work closely with other teachers to implement new digital tools in the classroom. She shared about a writing and feedback tool that another teacher used and how she worked with the teacher to implement the tool in her classroom. Additionally, Rebecca shared that she acquired many ideas from other teachers outside of her school building as well. She stated, “I use a lot of other teachers’ websites to get good ideas from and digital resources and digital activities and digital record keeping ideas, spreadsheets, all kinds of things.” With digital access, teacher collaboration is no longer limited by physical location and can now span the Internet.

Other ways teachers at South Brookside Elementary School engaged in learning about personalized learning with digital tools was self-initiated. Catherine stated, “Sometimes I’ll hear something and it’ll really stand out to me and so as soon as I can, I’ll just go to it and check it out and see if its useful.” Rebecca felt that they were provided the digital devices and had to figure out how to use them for instructional purposes. She shared a desire to have enough time to “try it” herself before wanting to implement a new tool in her classroom. But she also reflected that, “you learn from our mistakes.” Catherine said that after she heard about a new digital tool, she would try to “play with it a little bit” but only when she had the opportunity to think about it. She
also shared, “And so some of the stuff I never even tried because I feel overwhelmed by it with
the amount out there” while not having enough time to discover the tool for herself. Catherine
also stated, “there’s no end to the amount of resources out there. And so I think teachers spend a
lot of time looking for online resources.” When she did have the opportunity, she shared, “I’m
always of course thinking ‘okay, how can I use this, is this going to be helpful?’” Then, she
would spend time trying to figure out the digital tool and how to best use it with her student to
personalize their learning. Catherine felt, “And so I learned by trying.”

**Teacher Needs to Improve Implementation**

When discussing the resources and supports for teachers in implementing personalized
learning in digital learning environments, both Catherine and Rebecca identified two teacher
needs for better implementation within their classrooms. The most commonly identified teacher
needs found were: a) time to research, plan, and implement the use of innovative and engaging
digital tools to personalize learning and b) a scope and sequence of digital skills for students by
grade level.

Rebecca often discussed not feeling as if she had enough time to devote learning about
new and innovative digital tools to implement in her classroom. She shared, “there’s no time. I
just make notes of everything” and then “later if there is time” she would attempt to review some
of the tools she learned about. She indicated that she desired the opportunity to “find the time” to
research “the best tools out there” and then plan on how she could use them for her instruction to
personalize learning for her students. Catherine also noted throughout her interviews that she
desired “time to play with different programs” to figure out which ones were best for
personalizing instruction for her students and their specific learning needs.
In addition to more time to investigate digital tools and to plan for personalized instruction, Catherine also noted, “I would like to see…a digital learning scope and sequence for the students. And maybe for the teachers as well.” She felt strongly with the push for the use of digital tools in education, students needed to have mastered certain digital skills by each grade level. Catherine shared:

I think it would be great if we had something set up when you’re in kindergarten, you do these lessons and then you move on. So really everybody’s on the same page because I think it’s very clear who used to having a computer at home and who’s not.

She believed that by starting students in kindergarten and teaching new specified and developmentally appropriate digital skills each year, students would be more technologically aware and prepared. Ideally, there would be less “misuse” of the digital tools. Catherine referenced the use of “common sense media” and various digital citizenship and skills lessons that students need to acquire and know how to do with technology.

**Finding 5: Reflecting on Successes and Challenges**

Both teachers from South Brookside Elementary School shared their successes and challenges with personalizing learning through the digital learning environment for their students. As the participants discussed their successful and most challenging experiences with planning, preparing, and implementing personalized learning for their students, two major findings emerged from the successes with personalized digital learning environments including:

a) increased student motivation and engagement and b) increased access to information.

Additionally, the teachers from South Brookside Elementary School also discussed the challenges with personalized digital learning environments. From these discussions, three findings emerged including: a) pressure to use digital tools, b) when technology fails, and c) student misuse of technology.
Successes With Personalized Digital Learning Environments

*Overall I have been very pleased with the success of personalized digital learning environments and effect it has on student motivation.* – Rebecca

When discussing their positive experiences and successes with implementing personalized digital learning environments, Rebecca and Catherine shared that they felt that students were much more engaged and motivated throughout the learning process. Rebecca stated, “It’s very motivating. The children like computers. They like different websites. They like the games.” Catherine agreed and felt that her students “have fun” while learning with digital tools and that the students “get excited a lot of the times.” Both Rebecca and Catherine believed this to be success with implementing personalized digital learning because they felt that if students were focused, motivated, and engaged then they were learning.

Rebecca shared that at first, she had not bought into using digital tools to personalize learning for students. However, after watching the media specialist deliver a lesson using digital tools with her students and how excited and engaged they were with learning, it encouraged her to try to implement the use of other digital tools into her classroom as well. She shared, “I think they are a lot more engaged and there’s a lot more buy in to what they’re doing.” Rebecca continued that it was important for students to be excited about what they are learning and that “Digital tools are so engaging,” and it’s almost as if the students don’t even know they are learning.

In addition to an increase in motivation and engagement, the use of personalized digital learning has increased the access to information and research for students and teachers. In a journal reflection, Rebecca wrote:
Let’s face it, we are in a modern world where everyone has a device and those devices are rapidly becoming a dominant force in our social culture. Why not use them for educational purposes as well? Students feel empowered by access to people and information on a global scale.

Rebecca and Catherine felt that the using digital tools in their classrooms have increased the students’ access to the world around them and the information they can learn from the world. Catherine went onto say, “It’s opened up the world to them, literally, so they can find information they want.” Rebecca also shared, “The world seems to be shrinking and technology seems to be making it shrink very rapidly. You can Skype with somebody in Washington State as long as you get the time zone thing right.” With technology you can have a conversation with “people all over the country.” Catherine also noted that with technology today, if you do not know something or cannot remember a piece of information, then “we’ll say ‘oh, well look it up.’ We’ll just look it up on our phone real quick. We have access to information so fast.” The access to digital tools in to personalize learning experiences for students has made the world much more accessible at the touch of their fingertips.

Challenges With Personalized Digital Learning Environments

“I think I have a love/hate relationship with it.” – Catherine

Throughout the interviews and journal reflections, Catherine and Rebecca shared challenges they had with implementing personalized digital learning environments. Both of the teachers discussed how they spent a significant amount time preparing personalized lessons for their students that involved using innovative digital tools and then the technology wouldn’t work properly. Catherine and Rebecca expressed frustration when the technology did not work properly or when the Internet went out. Rebecca shared her biggest frustration was “when the technology doesn’t work or the students left their computer at home - or their charger at home.” She struggled with how to keep those students learning when the technology was not readily
available. Rebecca further explained, “I’ll give them something else to do, but they’re not able to continue whatever we’re working on because they just don’t have it.” This caused a source of disturbance, as the teachers felt like they were have to plan two lessons in the event the technology failed.

Additionally, both teachers at South Brookside Elementary School indicated some pressure to use technology. In her first journal entry, Rebecca shared, “Our school system has paid a lot of money for the students to have one to one devices so it is expected they are used regularly.” Catherine also indicated that the pressure to use technology was a struggle for her. She shared, “I don’t like that it’s – it’s like ‘Okay, make sure you have the technology piece,’ because I think sometimes it’s just not appropriate.” Furthermore, Rebecca indicated that when she was planning, she planned her lessons “thinking about technology because I feel like we are required to. I plan knowing that I need to try my best to put it in there somewhere because it’s expected.” Catherine agreed with Rebecca “I know it’s an expectation.” However, she also stated “but I’ve never felt like somebody’s watching over my shoulder.” While both teachers indicated the pressure to incorporate digital tools to personalize instruction, they also shared that they did not feel like they would get into trouble if they had a lesson that did not include technology.

Case #3: T. J. Johns Elementary School

Both the initial and follow-up individual interviews with Bethany Albritton and Stephanie Lancaster were held on-site at T. J. Johns Elementary School within their respective classrooms. Despite having taught all day, both teachers appeared to be genuinely excited to participate in the study.
**Finding 1: Collective Understandings of Personalized Learning**

“My definition of personalized learning is adapting whatever work you have for them, the content, adapting that for the students to access the delivery, perhaps adapting that as well for the student. Just differentiation.” - Stephanie

At the start of both the initial and follow-up interviews, Stephanie and Bethany were asked to describe their understanding of personalized learning and how it looked in their classrooms at T. J. Johns Elementary School. As the participants shared their understanding of personalized learning, two findings emerged from the interviews and documents including: (a) personalizing for students’ needs and b) personalized learning as differentiation.

**Personalizing for Students’ Needs**

At T. J. Johns Elementary School, an emphasis on identifying the learning needs of students to personalize instruction was evident. Stephanie shared, “Personalized learning to me is making the content accessible to students at whatever level individually so that they can access the content.” Bethany defined personalized learning as “getting to know each student and seeing what they need and kind of presenting it to them in the way that benefits them.” Both teachers felt that it was vital to take the time to get to know their students as learners.

Stephanie and Bethany indicated that to personalize learning, students’ instructional needs are determined through assessing the students in various ways. Bethany suggested that through conversations and observations, she took the time to get know her students and assess their “language skills and things they need to work on” in order for her to personalize learning for them. Furthermore, she indicated the need to ask her students “what they feel strong in, what they thought they need to work on.” Bethany believed that it was vital to understand her students’ academic strengths and weaknesses in order to provide them with instruction that was
tailored to their needs. To understand her students’ academic learning needs, Stephanie proposed using assessment data to determine her students’ strengths, weaknesses, and proficiency levels. She shared, “So we look at reading, speaking, listening, and writing” and “I also look at their Lexile level or their PM Benchmark level.” Bethany also agreed that using student information data gave her a better idea about how to personalize instruction and teach her students.

**Personalized Learning as Differentiation**

Both Bethany and Stephanie felt that personalized learning was similar to differentiation. In fact, when asked to define personalized learning Stephanie’s response was “just differentiation.” Bethany also described personalized learning using the word “differentiated” where “students were working on the same thing, but they can have their own individual assignment…we’ll be doing the same assignment, but it is differentiated.” Both teachers from T. J. Johns Elementary School felt that personalized learning was similar to differentiation and oftentimes involved putting the students into groups based on their academic strengths and weaknesses.

When discussing what personalized learning looked like in her class, she responded that she would “Differentiate the work in order for them to master the standard.” Bethany gave an example of what personalized learning looked like in her class involving three groups: high, medium, and low. She shared:

If we’re writing about one of our most recent standards, they would read two passages and compare and contrast them. So maybe for my lowest group, they might have sentence starters, things like that, already typed in their Google doc. Whereas my extended group, maybe they have some extension questions on their document too.” So there might be three different documents. They might look a little different but they’re all the same assignment.

Additionally, Stephanie also explained personalized learning in her room through student grouping based on their academic performance on various assessments. Stephanie described,
“My students are in groups based on their reading levels and also based on how they did on the DORF assessment.” She continued to share that the students were put into reading groups based on their comprehension and fluency skills using a variety of other assessments. Stephanie shared:

We use SRI- Scholastic Reading Inventory. We use PM Benchmarks. We do post-tests…we have reading tests as well, Study Island. So if we can shoot out a quick assessment to them on Study Island. Or even the Google Docs that they turn in to me…If certain students aren’t grasping something then I can regroup them.

Both Bethany and Stephanie described personalized learning similar to differentiation. Furthermore, they also indicated that in their classrooms, personalized learning also looked like small group instruction based on a variety of assessment.

**Finding 2: Planning and Preparation Practices Within a Personalized Digital Learning Environment**

In both the initial and follow-up interviews, Bethany and Stephanie shared their planning and preparation practices for personalizing learning through the digital learning environment for their students at T. J. Johns Elementary School. As the participants shared their experiences and perspectives with planning and preparing to personalize learning for their students, two major findings emerged from the interviews and documents including: a) components considered while planning for personalized learning and b) the planning process for personalized learning.

**Components Considered While Planning for Personalized Learning**

Throughout the interview and journaling process, Bethany and Stephanie discussed several components they considered while planning to personalize learning for the students in their classrooms at T. J. Johns Elementary School. The similar components considered by the two teachers when planning a personalized digital learning environment included the curriculum and standards, student needs and assessment data, small group instruction, and digital tools.

Finally, the teachers shared the process in which they used the various components while
planning for personalized digital learning environments for their students.

Curriculum and standards. When discussing how they plan their lessons for personalized instruction, both Bethany and Stephanie indicated that they started with the curriculum and content standards. Stephanie felt it was important that she based her instructional planning off of the curriculum. She stated:

Its all standards based. We break down the standard together. We look at what needs to be addressed and I try to make sure that my students are being taught the same standards no matter what proficiency level they’re at.

Stephanie further suggested that her responsibility was to personalize learning for her students “in order for them to master the standards.” In her first journal reflection, Bethany explained what she used to plan her personalized instruction for her students, and elaborated:

The focus of this quarter for reading is that students will integrate information from two texts in order to write knowledgeably about a topic. My classroom utilizes Google Classroom, so while planning this unit I intended to assign a personalized digital assignment for each student through this format.

While she does not explicitly state using the curriculum and standards to plan, Stephanie does reference “the focus of the quarter is integrate information from two texts in order to write knowledgeably about a topic” which is an English Language Arts standard for her grade level.

Student needs and assessment data. Both Stephanie and Bethany indicated that using student assessment data to plan for their personalized instruction was essential. Using the student needs data helped them to make informed decisions about how to best personalize the learning for their students. Stephanie shared that one of the steps she takes to plan her instruction is to begin with her “students’ proficiency levels” and determine the students’ “reading, speaking, listening, and writing” skills. Additionally, Stephanie also uses the students Lexile reading level and their PM Benchmark reading level to determine her small group instruction. Stephanie implied that this data informs her of students’ strengths and weaknesses and where to begin.
Bethany also used various assessment data to inform her instructional planning. She shared that to form her small reading groups that she used “DIBELS, so I have some fluency groups.” Furthermore, Bethany indicated that she used the SRI (Scholastic Reading Inventory) assessment to determine her students’ level of comprehension on grade level text. Based on this information, Bethany would plan her small group reading instruction based on those students’ needs. She also shared “In math, we use pre-tests and post-tests to kind of form those groups.”

She further explained that she entered all of her students’ scores into an electronic document and it would generate her students into groups. Bethany explained:

> It tells me which kids are exceeding, progressing, meeting, and it groups them rather than me sitting out and looking at the scores and making my own list. It already does that for me. That’s also what I use to make those groups in math.

Despite using different forms of data, both Bethany and Stephanie believed that using data was a necessary component to inform their personalized instruction.

**Small group instruction.** Planning out and forming small groups for instruction based on their strengths and weaknesses was an important component to the teachers at T. J. Johns Elementary School. Both Bethany and Stephanie discussed thoughtfully planning out their groups using various forms of assessment data. When explaining how she plans and what she considered when forming her small group instruction, Bethany shared:

> I do a lot of small groups. I’m lucky to have a lot of collaboration in my classroom, so most of the time this year I’ve had at least four adults in my room most of the day. I can split them into groups, kind of according to their abilities.

Bethany further detailed that with having four adults in her classroom, she planned to have multiple small groups and each adult would assume the role of delivering direct instruction to a small group based on their needs. In addition to forming small groups, Bethany also planned three leveled versions of an assignment for the small groups. She explained that she would plan a
“middle of the line” version of an assignment first for the on grade level students. Then, she would “make a copy of it” and make changes to it for an extension group or high achieving group. Last, she would make another copy of the “middle of the line” version and would “add a word bank or some kind of manipulative that they can use, some kind of tool” and would provide this to a below level group that needed additional support.

Stephanie shared also discussed small group instruction as an important component for planning personalized learning. She shared that while personalized learning can be designed for individual students, she generally planned for groups of students. Stephanie stated:

For some students, it is personalized one-to-one. Like it’s personalized just for that student. That student is gonna have a completely separate literacy menu than all of the other kids. But in reality, in what I truly do, I group my students based on sort of proficiency level or reading level or even a math pre-test. I group them and personalize the learning environment for that group.”

Furthermore, Stephanie indicated that she often considers what type of teaching she will do for each lesson in her small groups. She said, “It might be parallel teaching, team teaching, station teaching,” but that each lesson would be delivered in a small group environment.

**Digital tools.** When discussing the important components of planning for personalized learning in digital learning environments, both teachers at T. J. Johns Elementary School indicated that digital tools were of the upmost importance. Bethany believed that her lesson planning process had “gotten more simple” because she used her own technology and digital tools when developing her plans. In fact, when Bethany planned her instruction, she planned by creating a Google presentation that she used with her students to deliver instruction. Bethany also said, “I just put the link in my plans and you can click it and see everything that I do…my plans are more rich because you can see everything I am doing.” She felt that using digital tools in her planning was important not only for her students to use, but also for her lesson plans. By
using a digital platform like Google Presentation for her lesson plan document, Bethany was able to use that planning document for her instruction as well.

Stephanie also indicated that while she planned, she also considered how she could integrate technology into her lesson. She said, “We are one-to-one so because I teach 4th and 5th grades, I have the luxury that all my students have netbooks.” While planning for personalized digital learning, Stephanie said, “You’re constantly in the back of your head thinking about how you’re gonna use a digital tool and embed it into your lesson.” Furthermore, Stephanie also indicated that while planning she tried to “embed technology” into all parts of her lesson framework. For example, while planning she would think, “How can I use a digital tool to do this opening so that my kids will get what they need from the opening?” Stephanie indicated that throughout her planning process she constantly thought about how to best incorporate technology into her personalized instruction.

The Planning Process

It was determined that both Bethany and Stephanie considered similar components when planning for a personalized learning environment for their students. From the interviews and journal reflections, it was found that the commonly used components considered while planning at T. J. Johns Elementary School included curriculum and standards, student needs and assessment data, personalizing through small, flexible groups, and digital tools. These four components were key factors for both Bethany and Stephanie in their planning process for personalizing learning in digital learning environments. While the components considered in the planning process were similar, how the two teachers at T. J. Johns Elementary approached the planning process did vary in some ways.
Both Bethany and Stephanie agreed that the first step in their planning process was to identify the curriculum and standards that they were to teach for that unit. In fact, Stephanie said, “Everything is standards-based instruction.” All instructional decisions are centered on the standards that students are expected to know, understand, and be able to do. In fact, Stephanie clarified, “I try to make sure that my students are all being taught the same standards no matter what proficiency level they’re at.” The development of the students’ small groups for personalized instruction is also based on the curriculum.

After the standards had been identified, a next step in the planning process was to identify the students’ needs based on various assessments. Bethany indicated using various assessments to determine her students’ strengths and weaknesses. She then would use this data to form her small groups for personalized instruction. For example, in Reading, Bethany used fluency and comprehension data from various assessments to form special groups based on their reading needs. Stephanie also used her “students’ proficiency levels” and Lexile reading level and PM Benchmark reading levels to determine her students comprehension and fluency needs to form her small groups for personalized instruction. Both Stephanie and Bethany suggested that the use of student needs information supported their planning for a more personalized learning experience for their students.

Once the students’ needs were determined, then Stephanie and Bethany thought about what digital tools to include in their lessons to personalize instruction for their students. At the beginning of the implementation of one-to-one digital tools with the students, both Bethany and Stephanie felt like they had to include a digital tool throughout every part of their framework due to school district expectations. However, Stephanie indicated that, over time, the use of the digital tools became more of a “natural fit” in the lesson planning process.
Finding 3: Common Instructional Practices with Personalized Digital Learning Environments

“I can comment with them through technology easily. It's made it a lot easier for conferencing and things like that.” – Bethany

In both the initial and follow-up interviews, both teachers from T. J. Johns Elementary School shared their common instructional practices with personalizing learning through the digital learning environment for their students. As the participants shared their daily instructional practices, experiences, and perspectives with implementing personalized digital learning environments for their students, three findings emerged from the interviews and documents including: a) small group instruction, b) providing feedback, and c) digital tools for personalized instruction.

Small Group Instruction

Throughout the interviews and journal reflections, both Bethany and Stephanie described their classroom instructional practices with personalizing learning in digital learning environments. The teachers at T. J. Johns Elementary School discussed that on a daily basis students worked in small, flexible groups that were differentiated based on their students’ abilities. Bethany explained that to meet the needs of her various learners, she used all of the adults that worked in her classroom to form small groups. She described her classroom:

I do a lot of groups, small groups. I'm lucky to have a lot of collaboration in my classroom, so most of the time this year I've had at least four adults in my room most of the day. So that really helps. I can split them into groups, kind of according to their abilities

Stephanie also used small group instruction to promote personalized learning for her students. She said, “In my classroom, it looks like lots of small groups, leveled direct instruction - it’s reading - based on their reading levels.” Stephanie further explained how she used assessment
data to form and change those groups based on her students’ changing learning needs. She clarified, “So if we can shoot out a quick assessment to them…certain students aren’t grasping something then I can regroup them. They’re really flexible groups.”

In addition to placing students into small, flexible groups based on their strengths and weaknesses, Bethany and Stephanie explained how they differentiate the work for their students within their respective groups. After she has placed the students into their four small groups for personalized instruction, Bethany explained, “I make the menus for the two higher groups and my [collaborative teacher]…will do the two lower groups. And that's just so that we can kind of focus more on what they need.” While each group has a different reading menu to complete, all of the students in the classroom are working on the same standards or topic. Stephanie also shared how she provided instruction to her small groups. She explained:

I assigned each leveled reading group a Padlet Wall and topic. The lowest reading group (group A) described the characters, the next highest group (group B) described the setting, the next group (group C) described the events, and the highest group (group D) determined the theme. The assignments were purposeful and personalized to meet the needs of each reading group.

Both teachers at T. J. Johns Elementary School indicated that using small, flexible groups to personalize instruction for students based on their strengths and weaknesses was a critical component of their common instructional practices. Furthermore, both Bethany and Stephanie believed that it was vital for them to differentiate the assignments based on a common standard and their learning needs for each respective group.

**Providing Feedback**

Throughout the interviews and journal reflections, the teachers at T. J. Johns Elementary indicated that “providing feedback” to students was an important instructional practice they employed in their classrooms each day. Stephanie explained that this was a rewarding
instructional practice because the students have instant information on the areas they have performed well and in what areas they need to improve. She shared, “I feel like it makes them get rewarded or even corrects their thinking instantly.” Stephanie explained what providing feedback looked like in her classroom. She enlightened:

As the students were working on their Google Doc I was able to provide immediate feedback using the comments application. The students really enjoyed this lesson and loved the ability to share their thoughts. More importantly, they loved getting my comments and replying to them in the Google Doc.

Additionally, “So if I’m on that student’s shared screen that shared Google Doc, I’m able to make immediate feedback and I can have multiple documents up on my screen and feeding back to multiple kids at one time whereas paper/pencil, I’m kind of having to float around.” Bethany also provided feedback to her students. She explained, “It looks crazy because I’m sitting here on my computer, but I’m actually conferencing with kids all over.”

Stephanie appreciated the possibility of providing feedback to her students and found it “rewarding” to “watch them change their thinking on that Google Doc and their response.” Furthermore, Stephanie believed that providing feedback to her students allowed her to support her students’ growth through working through their misunderstandings and misconceptions.

Both Stephanie and Bethany indicated that the use of digital tools makes providing immediate feedback to their students possible. Bethany shared, “I can comment with them through technology easily. It’s made it a lot easier for conferencing.” Stephanie agreed that the access to digital tools made it possible to provide feedback that was instantaneous and immediate for students. Stephanie shared, “The quickness and the instantaneous response and feedback of working with the digital tool is a big plus of technology,” and she further detailed:

I might type a comment to a student and it would pop up on their computer and they would - their eyes would light up because they're getting that instant feedback. So right then, you're like, ‘Okay, this is - this is working for this student.’
Stephanie asserted how “powerful” providing feedback was to her students and to see them take corrective action to their own work based on the feedback provided.

Digital Tools

Both of the teachers at T. J. Johns Elementary School believed that the use of digital tools to personalize learning was essential. Stephanie shared, “I do use the computer a lot. I use technology. I use Google Classroom.” Stephanie explained the Google Classroom like this:

Google Classroom is a new app that Google started this year and I’m able to post assignments and announcements onto a webpage. The students have a code. They log into the code. They click on the app, put in the code, and are automatically filtered into my Google Classroom on the web space. And then it will list assignments that are due and it allows them to just click on…I can link anything…Google docs, another webpage, I could attach PDFs, pictures, anything I want. And it will automatically generate those things for them.

Bethany also indicated that she used Google Classroom with her students and was able to upload any assignments or documents that they needed for their instruction. She stated, “I just post it on our page and everybody's got access.” Both teachers indicated that the use of Google Classroom helped them to save paper copies and to keep organized.

Stephanie indicated that she preferred to use digital tools that were an extension of Google Apps. These digital apps included Google Classroom, Google Docs, Google Presentation, and Read and Write for Google. When discussing how she personalizes learning for her students she explained how she used Google Read and Write. It is an extension of Google that allowed students to use the app when they are accessing a “webpage, a PDF, or Google Doc.” When discussing her use of the Google Read and Write application, Stephanie further detailed:
They’ll see a little icon that pops up…And what it allows them to do – it has different functions. It has text-to-speech so it will read the document to them. Speech-to-text – they can talk into a microphone and it can type for them. It has word prediction so as they’re typing, a predictor will kind of throw out a couple words they think might come next. It has these highlighting tools, where you can highlight words and pull out the vocabulary list that it automatically generates a picture for, a definition for, and then allows a student to go back and type in other notes. It creates an automatic Google Doc of that. It also has a fact-finder so if they highlight a word and click fact-finder, it will open up a Google search for that word automatically and it also has a dictionary and picture dictionary so if they highlight a word and click dictionary/picture dictionary, a definition or picture will pop up.

Stephanie used Google and Read and Write to personalize learning for her students’ needs. This application provided students who struggle with reading or writing, an opportunity still engage with texts online while having digital support while they were reading or drafting their own writing.

Bethany and Stephanie both shared that they used digital tools to personalized instruction including various digital teaching and assessment programs that allowed students to practice various content concepts and provided them feedback on their performance. These tools included programs such as Successmaker, Ticket to Read, Pairdeck, and Math in the Fast Lane. These digital assessment tools informed the teachers of how their students were performing on particular standards and concepts. These digital tools would also adjust the question levels based on the students’ performance. Stephanie indicated that she really enjoyed using Pairdeck in her class as an assessment instrument. Stephanie explained:

Pairdeck is a Google app that allows you to make slides and it’s really a neat formative assessment tool because the slides…what the kid sees is different from what you see, which is your dashboard. So all the kids will see up on the board will be a question you might ask. So it embeds your assessment into the slides. So if the student sees a multiple-choice question that pops up, it will just have the question on the board. They’ll see their choices and when they click on their choice, it shows me what the students are answering. So, it’s really helpful because you can do those quick formative assessments as you’re teaching and going along. You can add quick slides, thumbs up/down. It’s really awesome.
Bethany shared that she enjoyed using various digital assessment tools. She felt that not only did they provide her with information on how her students were progressing, but that “it’s fun for them” and that “their hunger” for technology has made it a successful instructional tool.

**Finding 4: Supports and Resources for Implementation**

Throughout the initial and follow up interviews and journal reflections, Stephanie and Bethany shared various supports and resources for implementing personalizing learning through the digital learning environment for their students at T. J. Johns Elementary School. As the participants shared their experiences and perspectives on the use of supports and resources to personalize learning for their students through a digital learning environment, three major findings emerged from the interviews and documents including: a) role of the media specialist and instructional technologist specialist, b) professional learning opportunities, and c) teacher needs to improve implementation.

**Professional Learning Opportunities**

Both of the teachers at T. J. Johns Elementary School indicated that they had not had any formal professional learning on how to implement personalized digital learning within their classrooms. However, both Stephanie and Bethany indicated that most of their learning on personalized digital learning environments came from collaboration with other teachers, initiating their own learning and discovering new tools by playing with them, and the sharing of their media specialist and instructional technology specialist.

Both Bethany and Stephanie shared that they did not have much formal professional development on personalized learning with digital tools at their school. However, they both shared that they collaborated with teachers within their school and outside their school to discover new digital tools to implement into their classrooms. Bethany shared that at faculty
meetings and planning times, “we do share outs” where teachers shared with everyone various
digital tools that they tried and found successful. She also shared she often collaborates with her
teammates to discover different tools. She worked closely with a teammate who shared “Padlet”
with the entire faculty. Additionally, Bethany also stated, “If anyone finds a good site, we email
it out to the whole school.” While this is not really formal professional learning, both Bethany
and Stephanie indicated that this “sharing out” and collaboration was helpful for implementing
digital tools in their classrooms.

In addition to collaborating with others within the building and outside of the building,
Bethany and Stephanie indicated that much of their learning has come through their own
initiation of learning. Bethany stated, “I’m one of those people that I like to just get on
something and play with it and figure it out.” Stephanie mirrored that initiative:

I kinda just took it and ran with it the best I could. But, my personality is the type where
if I’m doing the best thing I can for my students and I stumble and I fall through the
process, that’s okay. But, I do see some teachers who, from the beginning until now of
this new experience, still struggling because they’re afraid to fail.

With that kind of self-initiative, Bethany felt, “most of our digital tools that we use, we’ve just
kind of discovered or maybe heard from another teacher and shared out.” Stephanie also agreed
that most of her learning on personalized digital learning came from her own motivation. She
shared, “I’ve reached out for a lot of professional learning. Stephanie shared that she had a strong
desire to continue her own professional learning. She stated:

If I am trying to develop life-long learners in my classroom then I too have to be a life-
long learner. Showing your students that you strive to learn new things is a powerful
message for any teacher to share.

For example, Stephanie shared that she joined her schools’ “technology team” so that she could
learn more about using digital tools in her own classroom. Furthermore, she also joined a
technology Google Plus community that included other schools and she can “see other school’s
posting things.” From this, Stephanie uses ideas from these resources to try new technologies to personalize learning in her own classroom. However, she stressed, “But that’s a lot of teacher initiative on my part, reaching out to learn those things.”

Stephanie shared that she “reached out” to her principal to attend a technology conference, but that was not something that all of the teachers at her school had the opportunity to do. She expressed, “I’ve been lucky enough to go to EdTech Southern Summit. It was a Google for Education two-day summit where I got to learn a lot.” Part of her attending the conference required for her to return to the school and redeliver some of the digital tools that she learned about while there. Stephanie shared, “I redelivered what I learned at the Google Summit.” Further more she expressed that we had to opportunity to go to “each grade level, showing them Read and Write for Google, which helps me really learn that technology as well.”

**Role of the Media Specialist and Instructional Technology Specialist**

Throughout the interviews and journal reflections Bethany and Stephanie referenced their instructional technology specialist as a possible resource for implementing digital tools in their classrooms. To start, Stephanie shared, “The instructional technology specialists send out a monthly technology newsletter. It goes out to everybody, to the whole county with great resources and digital tools that you could use.” She often would use this email to gain ideas for innovative digital tools and then research and play with the tools to figure them out.

Stephanie indicated, “I think the instructional technologists have a huge role right now.” While she felt that they were an important component to implementing personalized digital learning environments, she expressed, “I think how they are used, building by building, is different.” While they felt that the role of the instructional technology specialist was instrumental, Stephanie and Bethany felt that they hadn’t had much professional learning in their
school with their instructional technology specialist. Stephanie shared, “His role is looked at differently than at other schools.” Both teachers felt that they had not had much formal professional learning on digital tools and desired to have that collaboration with the instructional technology specialist at their building.

Bethany did share that when the instructional technology specialist was available, “He’s always sharing something new to make our life easier.” For example, she detailed, “He helped us set up our data folder for math and showed us how to really benefit from that, seeing how it groups the kids for us.” With this digital data folder, Bethany was able to input her students’ assessment data and then it would generate the students into her small groups for personalized instruction. Bethany indicated that this tool was instrumental in supporting her differentiation and planning her small groups.

**Teacher Needs to Improve Implementation**

When discussing the resources and supports for teachers in implementing personalized learning in digital learning environments, both Bethany and Stephanie identified several teacher needs for better implementation within their classrooms. The most commonly identified teacher needs found were: a) time to research, plan, and implement the use of innovative and engaging digital tools to personalize learning and b) professional learning.

One of the major needs identified by the teachers was time. Both Stephanie and Bethany desired more time to research, collaborate, discover, and plan with digital tools to personalize instruction for their students. Stephanie suggested:

I think we need to have more time to play with digital tools and get to know one digital tool. Not time out of our extra time like…time embedded into what we already…our 40-hour workweek. So, we’re proud of being a school district that has the most professional learning days embedded into the calendar, let’s make them effective. And provide teachers with the time to learn about these digital tools.
Moreover, Stephanie vocalized, “I also feel that it should be communicated to all teachers that we should take the time, and be supplied the time, to explore digital learning environments at our own pace.” Bethany and Stephanie not only desired more time to attend professional learning trainings, but to also meet with other teachers to collaborate and plan personalized instruction with digital tools.

In addition to time, both teachers at T. J. Johns Elementary School wanted more professional learning on digital tools to implement in their classrooms to personalize learning for their students. In her final journal reflection, Stephanie wrote:

Our school district is fortunate enough to have technology resources for every student and I appreciate the work that has been done to get those for our classrooms. Now we need to streamline expectations and best practices so that every teacher understands our mission and goal for creating personalized digital learning environments.

Stephanie also explained how beneficial having the opportunity to EdTech had been for her and she felt “if everybody could have gone to that” or had attended a professional learning training on the best digital tools to implement for personalized learning, “it would have been awesome.” While they felt they were both motivated to research digital tools on their own and also seek collaboration with others in their building, both Bethany and Stephanie desired more formal professional learning. Bethany shared, “We are doing the best we can, but I would love to have some training on how I could use it in math more and just what else is out there.” Stephanie agreed, wishing someone would ask, “Hey, what professional learning do you need? We’re gonna supply that to you so that you can get what you need.” In her final reflection, Stephanie shared her desire for professional learning on the school district’s expectations and “exact meaning of personalized digital learning environments.” Formal professional learning on personalizing instruction for students in digital learning environments was determined to be a great need by the teachers at T. J. Johns Elementary School.
Finding 5: Reflecting on Successes and Challenges

“I kinda just took it and ran with it the best I could. But, my personality is the type where if I’m doing the best thing I can for my students and I stumble and I fall through the process, that’s okay.” – Stephanie

Both teachers from T. J. Johns Elementary School shared their successes and challenges with personalizing learning through the digital learning environment for their students. As the participants discussed their positive and challenging experiences and struggles with planning, preparing, and implementing personalized learning for their students, three major findings emerged from the successes with personalized digital learning environments including a) increased communication, b) increased student motivation and engagement, and c) increased access to information. Additionally, the teachers from T. J. Johns Elementary School also discussed the challenges with personalized digital learning environments. From these discussions, three findings emerged including: a) pressure to use digital tools, b) too much screen time, and c) student misuse of technology.

Successes with Personalized Digital Learning Environments

When discussing their positive experiences and successes with implementing personalized digital learning environments, Bethany and Stephanie shared they felt that one positive result was the opened lines of communication between students, parents, and teachers. Both teachers from T. J. Johns Elementary School felt that the access to digital tools and one-to-one technology has allowed students, parents, and teachers to communicate regularly and more easily. Stephanie felt that the use of digital tools in her classroom had improved the communication with her students during her instructional time. She provided an example of how the communication between her and her students improved through the use of a digital tool:
I think having that digital tool and having him do it on a Google doc made it more successful because the communication is more seamless just like I’m talking back and forth to you right now whereas if I were working with another student, I might write a note on his paper and he responds back…it might be harder for him to write out what he is thinking on a piece of paper than it is for him to type it real fast. Our kids are in a digital age now. They can see they are misspelling a word. It’ll show them. I just feel like it opens up communication when you’re going through technology because my students are used to texting and communicating through technology so they open up more to me through technology.

Bethany also shared that the lines of communication between her and her students have opened up with the use of digital tools in her classroom. However, her example extended the lines of communication beyond instruction in a classroom. With digital tools, students are able to continue learning and gaining support and instruction even outside of the classroom. In fact, Bethany stated:

I’ll have some kids that will email me when they get home and said, ‘I forgot how to do this, can you remind me?’ And I think about those kids that don’t have that at home. And so they’re not getting that extra, I guess, communication with me.

Bethany was excited to be able to communicate with her students even when she was outside of the school in order to support their learning.

Furthermore, Bethany felt the lines of communication had improved between the teacher and the parents as well. Bethany explained:

I’ve even had parents email me from their kid’s email and say – I had one over the break to ask me about how to log into Brain Pop so they could get on there. So, it’s been really great, like I said, for that communication.”

Bethany was pleased with the open lines of communication with her students and parents. However, she also indicated that she worried about those students who did not have technology at home and felt that they were missing out on the extra communication with the teacher.

In addition to the improvement of communication between students, teachers, and parents, both teachers at T. J. Johns Elementary School felt that with the use of digital tools to personalize
instruction for students, the students are more engaged and motivated in their learning and their production of work. According to Stephanie, “I think that it’s positive to have digital resources and digital tools because sometimes it makes them more engaged with what you are teaching.” She also believed that with the use of digital tools, students are more excited about learning and “there is more excitement about completing whatever work.” Bethany agreed that with students more engaged in learning with digital tools, that “it’s like they just took ownership in it.” She also indicated, “I think they’ve gained confidence…they’re more engaged, to me.” Overall, Bethany and Stephanie witnessed a marked improvement in engagement and motivation in their students with the implementation of one-to-one digital tools and personalized learning.

Another success noted by the teachers at T. J. Johns Elementary School about the implementation of personalized digital learning environments is that it improved the students’ access to information and resources. Stephanie believed, “It is evolving the way we teach and the way they access information for their learning. With digital tools and one-to-one technology students are able to access a variety of websites and digital tools to support their learning in the school, as well as at home. For example, Bethany explained:

I have two boys who just moved from Mexico within the last two years and their vocabulary, they’ve come to me and said there’s just too many words in English. And so I’ve given them certain websites they can get on even at home…instead of having to make flashcards.

Not only did these boys have immediate access to a digital tool that would support their learning of the English Language, but also they can access these websites using a digital device anywhere. The learning did not have to stop once they left the classroom.

Challenges with Personalized Digital Learning Environments

Throughout the interviews and journal reflections, Bethany and Stephanie shared challenges they had with implementing personalized digital learning environments. Both of the
teachers discussed how they spent a significant amount time preparing personalized lessons for their students that involved using innovative digital tools. Bethany and Stephanie expressed feeling some pressure to integrate technology and digital tools into their lessons. Both shared that the teachers at their school had been encouraged to use the students’ personal learning devices for instruction. Stephanie questioned, “But when? All the time? Do I need to have it in every lesson?” She and Bethany seemed to struggle with finding a balance with using digital tools in their classroom.

Some pressure came from the integration of technology being something considered during an observation. Stephanie explained:

If they come in and they see that you’re not using a digital tool at that exact snapshot of time when they come to observe you, even you might have had it in your closing, then the teacher feels dinged. Or maybe their walkthrough form won’t be as great because they didn’t have a digital tool used. I don’t think there should be fear.

Bethany was sure to “pull in technology” into her lessons. She further indicated that, “Whether they have their computers out or not” she always has some digital tool up in the classroom. She expressed, “We always try to throw something in there.” Bethany also shared that one way that she takes the pressure off herself is to just use technology throughout her lesson. In fact, she said, “I use technology a lot. Everything I do is on Google Slides and videos and things. Stephanie asserted that she feels that many teachers feel this way. She voiced, “You shouldn’t expect to walk in and be like I need to see computers out on every single student’s desk. But, I feel like some teachers think that that’s what they expect us to do.” With teachers feeling “pressure” to use digital tools to personalize learning, teachers are having to plan lesson thinking about how, where, and how often they are using digital tools for instruction.

With teachers using digital tools often through out the instructional day, Bethany and Stephanie indicated some concern on the amount of screen time their students were having.
Bethany shared she often tried to find a balance between using a digital tool and having face-to-face time. When asked her feelings on digital tools for instruction, Bethany said, “I feel like its beneficial, though I still see the need for that personal just sitting in a group and reading a book together. So, I try to do a good balance of that.” Stephanie admitted that with feeling pressure to use digital tools in her classroom and that she thought about using technology throughout her planning process. She stated, “you’re constantly in the back of your head thinking about how you’re gonna use a digital tool and embed it into your lesson plans.” She did not like this feeling and confessed:

I have guilt sometimes when I go home if my kids have been…they did their opening on the computer, their mini lesson they were all looking at the computer, their work session I was having them do something on the computer, and their closing was through Google forms. That’s, to me, yeah that’s great and it’s all digital but is that what’s best for them? I don’t think so.

Furthermore, Stephanie and Bethany both indicated that they wanted more of a balanced approach to their personalized instructional practices. They did not want to feel that they had to incorporate technology. Stephanie admitted, “I think there needs to be more of a balance.”

**Case #4: Downs O’Brien Elementary School**

Both the initial and follow-up individual interviews with Patricia Lange and Tracey Kirsch were held on-site at Downs O’Brien Elementary School. Tracey’s initial interview was held in a small office near the front office after school She chose this room because it would be a quiet place for us to talk. Patricia’s initial interview was held in her classroom after school. Despite having taught all day, both teachers appeared to be genuinely excited to participate in the study. Follow up interviews occurred during post-planning and the students had been released for summer. Both follow up interviews were held in the teachers’ respective classrooms.
Finding 1: Collective Understandings of Personalized Learning

“I think personalized learning is learning on a kid’s level, to their interest level, and how they
learn and what they specifically need.” - Tracey

At the start of both the initial and follow-up interviews, Patricia and Tracey were asked to
describe their understanding of personalized learning and how it looked in their classrooms at
Downs O’Brien Elementary School. As the participants shared their understanding of
personalized learning, two findings emerged from the interviews and documents including: (a)
personalizing for students’ needs and (b) personalize learning through interest and choice.

Personalizing for Students’ Needs

At Downs O’Brien Elementary School, Tracey and Patricia indicated that they considered
students’ academic needs an important component of personalized learning. Tracey felt that
personalized learning was “taking the needs and the wants of a person and applying that to what
and how they are learning.” Patricia believed that when personalizing learning, students should,
“learn the standard by doing the work and trying to comprehend it and make sense of it in their
own way, at a level that is right for them.” Tracey also felt that it was important to consider the
“needs of the student, like where there are deficits” to personalize the learning experience. Both
teachers felt that it was vital to take the time to get to know their students as learners. Tracey
indicates that personalized learning was based on what students “specifically need” to learn.

Personalizing Learning Through Interests and Choice

In addition to addressing the learning needs of students, Tracey and Patricia believed that
personalized learning could also include providing students with the opportunity to some choice
in their own learning. In fact, Tracey indicated, “I think personalized learning is learning on a
kid’s level, to their interest level.” Furthermore, she felt that it was important to consider “where
are they really at that you want to enrich?” Patricia agreed with Tracey about providing choice to her students to “pique their interests.” Patricia discussed the importance in allowing her student choice in selecting books to read. She wanted to encourage her students to read and by allowing them the opportunity to choose their own texts, that the students would be more interested in reading. By providing students with choice in their learning and the development of products that reflect their learning, Tracey felt that she was personalizing the learning experiences for her students.

Finding 2: Planning and Preparation Practices Within a Personalized Digital Learning Environment

“My goal in this was to provide students with interesting and new choices in how they wanted to show their knowledge on the subject.” – Tracey

In both the initial and follow-up interviews, Tracey and Patricia shared their planning and preparation practices for personalizing learning through the digital learning environment for their students at Downs O’ Brien Elementary School. As the participants shared their experiences and perspectives with planning and preparing to personalize learning for their students, two major findings emerged from the interviews and documents including: a) components considered while planning for personalized learning and b) the planning process for personalized learning.

Components Considered While Planning for Personalized Learning

Tracey and Patricia determined the following components of the planning process when personalizing learning and using digital means for their students.

Curriculum and standards. Throughout the interviews and journal reflections, Patricia and Tracey indicated the importance of considering the curriculum and content standards when planning for a personalized digital learning environment. Both teachers indicated the importance
of identifying the standards that students need to learn in order for them to meet grade level expectations. Tracey indicated that “coming up with the standards” was an important component for her before planning personalized instruction for her students. Additionally, Patricia agreed that in her classroom everybody is “working from the same standards” and everyone is “working on fifth grade standards.” Both teachers shared the importance of using the curriculum and standards as an important component of planning for personalized learning.

**Student interest and choice.** Another important component of planning for personalized learning found by Tracey and Patricia was considering student interest and choice. Patricia shared, “It’s more about choice.” She indicated that when she plans for projects, she likes to provide her students with opportunities to choose their topics and the products that reflect their learning. Patricia discussed her planning using “choice boards” to provides students with the opportunity to choose from a variety of activities that are based on their standards. Patricia indicated that by providing the students with the choice of which activities they could complete, that her students were also more engaged in the learning. Tracey also shared that she also tries “to give them some type of choice.” Tracey felt that incorporating student interest and choice into her planning was an important component because “they’re more driven to research and stick with something that they choose and that they’re interested in.”

**Student needs and assessment data.** According to both teachers at Downs O’ Brien Elementary School, an essential component of the planning process was to consider students’ learning needs when planning for personalized learning. Tracey and Patricia indicated that using student assessment data to plan for personalized learning was essential in order to provide each student with instruction that is based on their strengths and weaknesses. Tracey shared that she planned by “looking at data, item analysis and figuring out which kids are having trouble with
which things or which things that they’re meeting, exceeding.” Using this information, Tracey felt that she was better able to design lessons and instruction for her students based on their learning needs. Patricia supported this idea and shared, “As I plan for instruction I try and think about all the different levels of learners in my class. I have a wide variety of learners in my room.” With the varying learners and individual needs in their classrooms, Patricia and Tracey felt that using student assessment data to inform their instruction was imperative.

**Small group instruction.** Both Tracey and Patricia believed that forming small groups based on their students’ specific learning needs was an important part of planning for personalized learning. Tracey explained that she used her student assessment data to determine her students’ needs. Using this data, she would then “place them in the small groups base on need.” Furthermore, she would determine the “highest need for a certain group of kids” and group those students together. Once she formed that small group together based on a certain skill needed, Tracey then found activities to address their needs to complete throughout the week. Patricia also described how forming small groups was an important planning component. She shared she would “lump them into groups.” Furthermore, she planned groups and specific activities based on learning needs. For example, “These kids could work on this project with these resources or this group could do that.” Regardless of how it looked in the classrooms, both Tracey and Patricia felt that forming small groups based on the students’ learning needs was an essential component of planning for personalized instruction.

**Digital tools.** Throughout the interviews and journal reflections, both teachers at Downs O’ Brien Elementary School found that digital tools were a necessary component of personalizing learning for students. Patricia shared, “During planning I try and find engaging sites that offer a wide range of learning objectives.” She also shared that she often planned her
instruction using digital assessment programs such as Successmaker, VMath, Get Waggle, and Learning Farm that would provide her with feedback on her students’ performances.

Additionally, the teachers at Downs O’ Brien Elementary School liked to include interactive digital tools that engaged students and motivated them. Tracey shared her use of tools including Mystery Skype, Kahoot, and Edmodo to engage students.

**The Planning Process for Personalized Learning**

It was determined that both Tracey and Patricia considered similar components when planning for a personalized learning environment for their students. From the interviews and journal reflections, it was found that the commonly used components considered while planning at Downs O’ Brien Elementary School included curriculum and standards, student interest and choice, student needs and assessment data, personalizing through small groups instruction, and digital tools. These components were key factors for both Tracey and Patricia in their planning process for personalizing learning in digital learning environments. While the components considered in the planning process were similar, how the two teachers at Downs O’ Brien Elementary School approached the planning process did vary in some ways. When discussing her planning process, Tracey indicated that she began with “coming up with the standards” that the students needed to learn based on the state curriculum. Next, she used her student needs assessment data to “determine what they need the most help on.” This process helped Tracey to “put them into a specific group” based on their individual needs.

As far as the use of digital tools to plan for personalized learning, Tracey shared the process varies. Sometime she plans her instruction thinking, “I want to use this technology…how can I plan it in a lesson? And then another way…I want to do a project – what resources would help my kids?” Patricia agreed, that the digital tools are “just embedded” in the lessons and
projects that she plans for her students. She further indicated that she rarely planned personalized lessons for student around a digital tool.

**Finding 3: Common Instructional Practices with Personalized Digital Learning**

**Environments**

“We have come a long way at integrating the digital devices into the majority of our lessons.”

- Patricia

In both the initial and follow-up interviews, both teachers from Downs O’Brien Elementary School shared their common instructional practices with personalizing learning through the digital learning environment for their students. As the participants shared their daily instructional practices, experiences, and perspectives with implementing personalized digital learning environments for their students, three findings emerged from the interviews and documents including: a) small group instruction, b) student choice and interests, and c) digital tools for personalized instruction.

**Small Groups**

Tracey and Patricia found value in using small group instruction to provide students with personalized instruction. They also used assessment data to form their small groups and to determine which skills they need to review with their students in the small groups. Tracey shared:

I’ve tried to find out what the skills need of my students are and so I’ve given a lot of comprehensive assessments to try to figure out what each kid needs to be learning to group them based on that.

After an assessment is given, the teachers then form their small group instruction. Tracey indicated, “I determine after an assessment…but place them in the small groups based on need – so the highest need for a certain group of kids, grouping them together.” Tracey shared that she
used the student needs assessment data to determine which skills were the highest need or were the biggest priority to address. Using this information, Tracey indicated that she puts her students “into a small group with me where we do guided instruction and then practice on their own and then more guided instruction.”

Patricia also shared using small group instruction to support the learning needs of her students. She stated, “I try to meet with every student at least twice a week.” While in her small groups, Patricia expressed that she “works directly with them” and “helps them get their individual instruction” that is based on results of the assessment data. Patricia also indicated “my groups fluctuate.” She shared that her groups are often changing based on what the students need and how they are performing, Patricia clarified, “It’s real flexible grouping.”

Student Choice and Interests

In addition to using small group instruction as a common instruction practice to personalize learning for students, Tracey and Patricia also indicated that providing students with choice was an essential component of their instruction. Tracey discussed her use of “genius hour” where all of her students are allowed to “come up with an idea, a question, a topic that they are really interested in.” The students generated a large list and then worked together as a class to “narrow it down to a specific question and it couldn’t be a Google-able question. It had to be something they had to research. And some took it farther to figure out like a problem that they needed to solve.” Tracey furthered described, “They were always engaged the entire time because it’s something that they picked.”

Another way Tracey and Patricia incorporated choice into their instructional practice was through the use of “choice boards.” Other ways that Patricia involved the use of choice into her classroom included allowing her students to select books to read based on their individual
interests. She employed the use of a “CAFÉ” style reading class and did not assign students specific books to read based on a reading level or skills level. She indicated that the “CAFÉ model was to promote students’ interests and engage them in reading. Furthermore, Patricia shared a lesson plan document in which she provided her students with the standards and the overall purpose of the writing assignment. However, she allowed her students’ choice in that they were able to select a “specific event that took place during the Civil Rights movement” and write an informational essay on that event. Overall, incorporating student choice and interests into their instructional practices was an important component determined by the teachers at Downs O’ Brien Elementary School.

**Digital Tools**

The use of digital tools was also considered to be a common instructional component at Downs O’ Brien Elementary School. Patricia and Tracey both indicated that their students used their one-to-one digital devices “daily.” Both teachers indicated that the students engaged in the writing process through Google docs. In fact, Patricia shared how her team had developed a digital revising and editing process through Google docs to support their students’ writing. Tracey also shared that she enjoyed using interactive digital tools in her class such as Kahoot and Mystery Skype to engage her students in learning.

Tracey and Patricia shared that there were certain digital programs that they were encouraged to use with their students in order to personalize learning. These digital programs were all considered assessment tools and would adjust the questions based on the students’ responses. The programs shared by the teachers at Downs O’ Brien Elementary School included: Successmaker, Learning Farm, and Get Waggle. Patricia shared, “we have implemented Waggle this year and that is supposed to be more individualized.” For example, she further detailed, “If
they’re struggling with something, it pushes them back a few levels on Get Waggle. Now, it doesn’t drop them a grade level. It just remediates, maybe asks it in a different way, or gives them more questions.” Patricia and Tracey both found value in these programs as they could access their students’ “real time data” and then could provide intervention or support to the student based on their needs.

**Finding 4: Supports and Resources for Implementation**

Throughout the initial and follow up interviews and journal reflections, Patricia and Tracey shared various supports and resources for implementing personalizing learning through the digital learning environment for their students at Downs O’Brien Elementary School. As the participants shared their experiences and perspectives on the use of supports and resources to personalize learning for their students through a digital learning environment, two major findings emerged from the interviews and documents including: a) professional learning opportunities and b) teacher needs to improve implementation.

**Professional Learning Opportunities**

Both of the teachers at Downs O’ Brien Elementary School indicated that they had not had much formal professional learning on how to implement personalized digital learning within their classrooms. Patricia indicated that she had not had “any on personalized learning.” However, both teachers shared that they had attended a few professional learning session using digital tools. Patricia and Tracey noted that one of the training sessions that they attended at their school included “60 Tech Tools in 60 Minutes.” Both teachers found the training to be “overwhelming” as it was “it was a lot of stuff at once.”

In addition to a school level training, both Patricia and Tracey learned through their own initiative. This included researching online for new technology or attending trainings outside of
the school on their own time. For example, Patricia attended the district’s Summer Institute professional development. Patricia stated, “I tried to take every single one of them having to do something with technology.” Tracey also chose to attend the Georgia Educational Technology Conference and had for three years. Tracey indicated that she preferred to continue her own learning at GETC each year because she was able to “personalize” her own learning and select which courses she wanted to learn more about to implement in her own classroom. Furthermore, Tracey made the decision to return to college. With technology being on the forefront of education, she shared, “I got my Master’s in Instructional Technology.” All of these activities were completed by the teacher’s initiative and motivation to learn more about how to best incorporate digital tools in the classroom.

**Teacher Needs to Improve Implementation**

The teachers at Downs O’ Brien Elementary School identified their needs to improve their implementation of personalized learning with digital tools. Patricia suggested:

I would really like to focus on one - one aspect. And I don't want - and I don't want it to be like Get Waggle or Success Maker. I don't want it to be a program where the kid sits down and does 30 minutes of computer time. I would like to find things out there that I can incorporate into my lessons, like Kahoot and Edmodo, little formative assessments.

Furthermore, the teachers indicated a desire to attend professional learning where the teachers walk away with a lesson ready to implement. Patricia voiced, “Let’s make the lesson plan. Give me the supplies to do it.” The teachers did not want to attend a professional development where they sat and listened for a couple hours, but wanted to develop lessons to implement in their classrooms. Patricia clarified, “I want to walk away with something like that with technology at a professional development.” Tracey agreed and expressed the desire to have “specific ideas that you can take away something ready to go.” While attending professional learning, the teachers at Downs O’ Brien Elementary School wanted to be able to take away a lesson or tool that they felt
comfortable implementing in their classrooms. This was an important factor to attending professional learning for the teachers at Downs O’ Brien Elementary School.

In addition to walking away with a lesson to implement in their classroom, the teachers at Downs O’ Brien Elementary School also desired the opportunity to collaborate with other teachers in their grade levels across the district. Patricia shared, “I like kind of small - I like it when we break into - maybe third, fourth, fifth” but even then she preferred to just meet with the teachers in one or two other schools for a small group.

**Finding 5: Reflecting on Successes and Challenges**

“If it’s done right and it’s a free-for-all, they learn research skills, they learn writing skills, they learn presentation skills.” - Tracey

Both teachers from Downs O’ Brien Elementary shared their successes and challenges with personalizing learning through the digital learning environment for their students. As the participants discussed their positive and challenging experiences and struggles with planning, preparing, and implementing personalized learning for their students, two major findings emerged from the successes with personalized digital learning environments including a) increased student motivation and engagement, and b) increased access to information.

Additionally, the teachers from Downs O’ Brien Elementary School also discussed the challenges with personalized digital learning environments. From these discussions, three findings emerged including: a) pressure to use digital tools, b) when technology fails, and c) student misuse of technology.

**Successes with Personalized Digital Learning Environments**

When discussing their positive experiences and successes with implementing personalized digital learning environments, Tracey and Patricia reflected on many successes they
had with implementing personalized digital learning environments in the classrooms. From the interviews and journal reflections, the teachers at Downs O’ Brien Elementary School found that the students were more engaged in their learning and more motivated to complete their work. Patricia supported, “I think they’re more motivated to do work.” and that “I do think they find school al little more interesting because of the computers.” Tracey agreed, “They’re definitely entranced by the computers. They love them. They love to be on them. They love to use them.” She also felt that when she personalized instruction and used digital tools with her students she knew that “they’re going to get more work done and do better work.” Patricia believed this was because, “the activities that we can provide them and just the practice itself has become more engaging to them. And they love making projects…It’s all Google Docs or Google Drawings or all that of stuff.” With the integration of digital tools to personalize learning, both teachers at Downs O’ Brien Elementary School reflected that they had seen “great growth” in their students’ engagement and motivation to complete assignments.

In addition to an increase in motivation and engagement, the teachers at Downs O’ Brien Elementary School also felt that the students access to resources and information was also a success as a result of the implementation of personalized digital learning environments.

**Challenges with Personalized Digital Learning Environments**

Throughout the interviews and journal reflections, Tracey and Patricia shared challenges they had with implementing personalized learning with digital tools. To begin, both teachers indicated that they felt pressure to use the digital tools in their classrooms. Patricia claimed, “No. It’s not a choice.” She felt strongly that she was supposed to incorporate using technology in her classroom “every single moment of the day.” Furthermore, she explained, “If they walk in and you aren’t not using it,” she worried that she would get “dinged for not using technology.”
Tracey also indicated feeling a sense of pressure for her students to be using their digital devices for instructional purposes. She admitted, “I feel like because they are there, I have to use them” and “I also feel that it’s kind of like I might get in trouble if I’m not.” Tracey indicated a great appreciation for the digital tools that were provided to her students, but explained that Tracey also felt that it was a “catch 22” because she has the “technology to incorporate it” but on the other hand, but also felt that she might get in trouble if an administrator “walked in” and her students were not using the digital devices. Both teachers at Downs O’ Brien Elementary School indicated the desire to find a balance of using the digital tools in their classrooms so that this work was meaningful and purposeful and did not feel forced upon them.

In addition to feeling pressure to implement personalized instruction with digital tools in their classrooms, both Tracey and Patricia shared a frustration when the technology failed or “the internet doesn’t work.” Tracey specified:

I think the most horrible thing is that when you try so hard to integrate technology into your lesson plan and that’s all the lesson plan centers around...like you have to have the technology and the internet goes out or a bunch of kids can’t get on the computers or a kid’s computer didn’t charge.

She further detailed how the school did not have many back-up computers in the event that students’ did not bring them to school or if their digital device was not working. Tracey also expressed that she felt the need to have a “back up lesson” prepared in the event that the technology failed. However, Tracey stated, “You can’t make a backup for every lesson plan.” She indicated that it would be time consuming and very frustrating. Patricia also felt the frustration of students’ forgetting their computers or the Internet going out. She shared, “if the internet is down” was a major issues because “your whole lesson is like the computer.”

Both Patricia and Tracey also indicated that it was difficult to monitor the students and what sites they were accessing. Patricia implied that oftentimes students would have “the
program pulled up, but not actually on it.” For example, she shared that instead of completing an assignment that she caught her students playing on “Minecraft” or getting on “things that you’re not supposed to be on.” Tracey felt that she was not able to monitor the students effectively.

**Cross-Case Analysis**

Following the analysis of each case, a cross-case analysis was conducted. Throughout the cross-case analysis, the researcher identified patterns within the overall data by considering the emergent codes and categories from each individual case. The researcher employed the constant comparative method to ascertain themes from the patterns and to cultivate generalizations about the data. The findings from the cross-case analysis are presented in the context of the related literature and in relation to the emergent categories and themes in Chapter 5.

Five themes were generated from the data. Each theme represented the processes or experiences that guided the elementary school teachers in their sense-making of personalized learning through digital means. The sub-sections include the following: Understanding, Collaborating, Preparing, Implementing, and Reflecting. Table 4.5 illustrates the research question, themes, and description of themes derived from data analysis.
Table 4.5

Research Question and Themes

How Do Elementary School Teachers Make Sense of Personalizing Instructional Practices Through Digital Means?

<table>
<thead>
<tr>
<th>Themes</th>
<th>Description</th>
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<tbody>
<tr>
<td>Understanding</td>
<td>Elementary school teachers make sense of personalizing instructional practices through digital means by using prior knowledge and making connections to their understanding of similar concepts.</td>
</tr>
<tr>
<td>Collaborating</td>
<td>Elementary school teachers make sense of personalizing instructional practices through digital means by collaborating with others and learning from other teachers and experts.</td>
</tr>
<tr>
<td>Preparing</td>
<td>Elementary school teachers make sense of personalizing instructional practices through digital means by thoughtfully preparing for and planning while considering the important components needed to personalize their instruction.</td>
</tr>
<tr>
<td>Implementing</td>
<td>Elementary school teachers make sense of personalizing instructional practices through digital means by implementing lessons with personalized instruction and digital tools.</td>
</tr>
<tr>
<td>Reflecting</td>
<td>Elementary school teachers make sense of personalizing instructional practices through digital means by reflecting on the successes and challenges of their implementation, as well as determining their needs to improve their implementation.</td>
</tr>
</tbody>
</table>

The findings are presented and discussed as 5 sub-sections. However, the cyclical connection between the findings is also significant as each may inform another. Figure 4.1
illustrates the cyclical process of sense-making and the findings of how elementary school teachers make sense of personalizing instructional practices through digital means.

Figure 4.1 Sense-making Process for Personalized Learning through Digital Means

**Understanding**

Each participant in the study made sense of personalizing their instructional practices through digital means by using their prior knowledge and making connections to their understanding with similar concepts. For instance, the participants in the study discussed their understanding of personalized learning as it pertained to “differentiation” and using small groups to provide instruction to students that was based on their individual learning needs. Furthermore, they also connected personalized learning with using student interests and providing choice as an additional way to personalize instruction for students.

**Collaborating**

How elementary school teachers make sense of personalizing instructional practices in digital learning environments was largely determined through their opportunities to work with and collaborate with other teachers and experts on the topic. The action of collaborating with
other teachers, media specialists, and instructional technology specialists provided support and new learning experiences for the participants. Furthermore, the teachers indicated that they also gained new knowledge on how to personalize learning for students through digital means by “share outs” in faculty meetings and through emails.

Preparing

There were several factors that influenced the preparing phase of the sense-making process for elementary teachers when constructing knowledge on personalized learning through digital means. For example, preparing required self-initiative to learn, planning lessons with digital tools to personalize students’ learning, searching for resources, using student needs assessment data to inform their planning, and attending professional development sessions or conferences were all examples provided on how teachers prepared in order to make sense of personalizing instructional practices in digital learning environments.

Implementing

How elementary school teachers make sense of personalizing instructional practices in digital learning environments was informed through implementing lessons and activities that were personalized and used digital tools for instruction. The participants discussed their use of small group instruction, formative assessment computer programs, interactive digital websites such as Kahoot, NearPod, Mystery Skype, and Edmodo, organizational sites such as Google Classroom and class webpages, intervention sites including Google Read and Write, and providing feedback through digital tools like Google Docs.

Reflecting

How elementary school teachers make sense of personalizing instructional practice in digital learning environments was determined through reflecting on their successes and
challenges throughout the sense-making cycle. Teachers were also able to identify their needs in order to improve their experiences with personalizing instruction through digital means.

**Case Summary**

After within-case and cross-case analysis, several themes were generated from the data; specifically, the researcher found that understanding, collaborating, preparing, implementing, and reflecting were actions shared by the participants that determine how elementary school teachers make sense of personalizing instructional practices in digital learning environments. Figure 4.1 illustrated the relationship among the findings while Table 4.5 summarized each finding. Overall, the teachers desired to learn more about how to implement personalized learning through a digital learning environment through collaborating with other teachers and experts, as well as preparing by attending professional learning sessions and conferences. Additionally, much of the willingness to build new knowledge came from the teachers reflecting on their own practices and the desire to have a greater understanding of personalized learning.

The final chapter relates the findings to the current literature on personalized digital learning environments and sense-making. Additionally, the chapter will make connections from the findings to present implications for future research, school leaders, and policy makers.
CHAPTER 5
DISCUSSION AND IMPLICATIONS

The purpose of this study was to understand how elementary school teachers make sense of personalizing instructional practices in digital learning environments. The following research question was used to guide the study: How do elementary school teachers make sense of personalizing instructional practices through digital means?

Summary of the Research Design

A sense-making process was used to understand how the elementary school teachers construct knowledge on personalizing instructional practices in digital learning environments. A sense-making lens was used to understand how teachers move from the chaos of a new initiative, to an organized understanding of the implications of initiatives in their classrooms and to action.

The qualitative multiple case studies began with the researcher contacting the building level principals at four elementary schools that were representative of the demographics of the Cobalt County School District. With each principal, the researcher discussed the purpose of the study and reputational sampling was used, as the researcher requested that each principal recommend two upper elementary teachers to participate in the study. From the principal recommendations, the researcher contacted the teacher participants to inform them of the purpose of the study and to gain their acceptance to participate in the study.

Data were collected through interviews, journal reflections, and documents and other artifacts. Within-case and cross-case analysis was used to examine the collected data. Using the constant comparative method, both the within-case and cross-case data was analyzed to
understand how elementary teachers made sense of personalizing instructional practice through digital means. Themes were generated to present and discuss the results of the data analysis.

A review of the literature was conducted prior to the commencement of the study to help group the researcher’s perspective. Initially, the review began with a focus on defining personalized learning. Next, the researcher reviewed literature on the use of technology for instruction. Finally, the review concluded with an overview of sense-making theory as a conceptual and theoretical framework. Each section of the literature review supported the research in the development of the current study.

Discussion

Drawing from the relevant literature, five themes emerged from the analysis of the four case studies of eight teachers are discussed in relation to the process teachers use to make sense of personalizing instructional practices through digital means.

Theme 1: Understanding - Elementary school teachers make sense of personalizing instructional practices through digital means by using prior knowledge and making connections to their understanding of similar concepts.

All participants demonstrated some prior knowledge or connection to understanding personalized learning and using digital tools for instructional purposes in the classroom. Sense-making is a continuous process of using prior knowledge, conversation, and evidence to understand unfamiliar situations or experiences that, in turn, leads to organized action. Teachers and others draw on their existing working knowledge to interpret new instructional approaches, often reconstructing policy messages in way that either reinforce preexisting practices or lead to incremental change (Coburn, 2001; Jennings, 1996; Shifter & Fosnot, 1993; Smith, 2000, Spillane, 1999; Spillane & Jennings, 1997). The participants in this study understood the
relationship to using student ability information to inform their personalized instruction for students. Several teachers connected their understanding of personalized learning to their prior knowledge of “differentiation.” In fact, Kristin from Mt. Willow Elementary School defined, “Personalized learning is giving students what they need at their level. I look at this as differentiation.” While there are similarities with differentiation, personalized learning is thought to be a student-centered teaching and learning model that acknowledges and accommodates the range of abilities, prior experiences, needs, interests and goals of each student with the objective of moving every student to a higher standard of achievement (Bray & McClaskey, 2015; Cavanaugh, 2014; Wolf, 2012).

Furthermore, all of the participants across the four school cases understood the connection between student ability and personalized learning; however, only three of the schools (Mt. Willow Elementary School, South Brookside Elementary School, and Downs O’ Brien Elementary School) identified student choice and interests as an important component of personalized learning. O’Donoghue (2010) agreed that personalized learning, “reflects learner’s interests, preferred approaches, abilities and choices, and tailored access to materials and content” (p. 33). Rebecca from South Brookside Elementary School shared, “Personalized learning to me is structuring the curriculum so that its more tailored to the type of learner the child is, and giving the student choices and more buy-in.”

In addition to student needs and student interests, the teachers at Mt. Willow Elementary School also identified student-driven and student-centered learning to be an important component for personalized learning. However, the other three cases did not mention student-driven learning as an important component of personalizing instruction through digital means. Personalized learning puts the student at the center, as they become active participants in
determining the direction of their learning (Looi et al., 2012; O'Donoghue, 2010; Project Tomorrow, 2012; U.S. Department of Education, 2010; Wolf, 2012). With student-driven learning, students are setting goals and making informed decisions about their learning to obtain their goals. In fact, Bridgette from Mt. Willow Elementary School believed that to personalize learning for students she had to allow her students to drive their own learning. She shared how she allowed the students to analyze their own assessment data, write goals, and then select activities to complete that were based on their individual needs. Throughout this process she identified herself as more of a “facilitator” and she spent “less time standing up in the front of the classroom.” In a personalized learning environment, there is a shift in instructional practices where teachers serve more as mentors and facilitators to provide authentic and reflective learning experiences for students, instead of being the sole provider of information (Bray & McClaskey, 2013; Wolf, 2012).

**Theme 2: Collaborating – Elementary school teachers make sense of personalizing instructional practices through digital means by collaborating with and learning from other teachers and experts.**

The participants across the four school cases indicated developing knowledge on personalizing learning and digital tools through collaborating with other teachers, media specialists, and instructional technology specialists. Three out of the four cases (Mt. Willow Elementary School, South Brookside Elementary School, and T. J. Johns Elementary School) indicated the important role of media specialists and/or instructional technology specialists as being a support or resource for collaborating on personalized learning in digital learning environments. This correlated with the new role of the media specialist to work with classroom teachers to integrate technology for teaching and learning (Cox, 2008).
Furthermore, the participants indicated constructing knowledge about personalizing instruction through digital means through working with the media specialist and/or instructional technology specialist. Additionally, the teachers gained understanding by collaborating with other teachers or experts within and outside of their buildings. Catherine from South Brookside Elementary School shared that she often worked closely with another teacher who had earned a degree in technology and “ask questions sometimes” or would go to her for support on how to use a particular digital tool. This allowed her to gain knowledge about how to use digital tools to personalize learning for her students. Meaningful professional learning, collaboration, and specialized supports are needed to improve the instructional practices of teachers when implementing personalized learning and the uses of technology (An & Reigeluth, 2012; Deed, Lesko, & Lovejoy, 2014).

Theme 3: Preparing – Elementary school teachers make sense of personalizing instructional practices through digital means by thoughtfully preparing for and planning, while considering important components needed to personalize instruction.

Sense-making refers to how those individuals “structure the unknown” and make decisions on how to move forward (Ancona, 2012, p. 3). There were several factors that influenced the preparing phase of the sense-making process for elementary teachers when constructing knowledge on personalized learning through digital means. For example, the findings indicated that motivation, planning lessons with digital tools to personalize students’ learning, searching for resources were some ways that the participants gained knowledge through preparation practices. Additionally, the participants also acknowledged using students’ needs assessment data to inform their planning, as well as attending professional development sessions or conferences to prepare for personalized instruction. To prepare for personalizing instruction
with digital tools in mind, Rebecca from South Brookside Elementary School shared:

We follow a mandated structure for planning lessons. Each lesson must incorporate an opening (starting the lesson to get the kids excited about what they are doing or to get them thinking), a mini lesson (the actual instruction), the work session (a time for the students to practice the new skill and the closing (an activity at the end to assess what the students learned). I try to incorporate some type of digital activity into one of these areas each day. For example, I might have an interactive game projected on the board as the opener. During the mini lesson, I could show an instructional video from Khan Academy. The work session might include an assignment using Google Presentation to create a report or research project. Finally, the closing could include an activity like Wordle so students can reflect on what they know.

From this framework, Rebecca was able to construct knowledge about how to best prepare and plan lessons that were personalized to the students’ needs and interests using technology.

Action is based on how people notice or select information from the environment, make meaning of that information, and then act on those interpretations, developing culture, social structures, and routines over time (Porac et al., 1989; Weick, 1995). In order to prepare, most of the teachers across all four case studies indicated the need to initiate their own learning and to search for information and tools to personalize learning through digital means. Many teachers consider technology tools as essential in their classroom since they know that incorporating technology into their core subject lesson increases student engagement and knowledge retention (Moeller & Reitzes, 2011). Bridgette from Mt. Willow Elementary School indicated, “Technology keeps changing. What was cool this school year will be outdated next year and something will replace it. Therefore, I need to keep learning.” Furthermore, she stated, “I have made a conscious effort to learn about using technology in the classroom.”
Theme 4: Implementing – Elementary school teachers make sense of personalizing instructional practices through digital means by implementing lesson with personalized instruction and digital tools.

All participants indicated that they constructed knowledge through implementing personalized instruction through digital means. During the implementation phase, teachers put into practice small group instruction designed based off of student needs assessment data. Stephanie from T. J. Johns Elementary School supported this notion through the implementation of personalizing learning with digital tools in her classroom. She said:

I kinda just took it and ran with it the best I could. But, my personality is the type where if I’m doing the best thing I can for my students and I stumble and I fall through the process, that’s okay.

Many sense-making theorists argue that school and classroom culture, structure, and routines, result, in part, from “micro-momentary actions” by teachers and other actors in the school (Porac, Thomas, & Baden-Fuller, 1989). Most of the teachers across cases used digital tools to remediate or to extend through small group instruction and using digital tools. Stephanie shared her implementation:

I do a lot of groups, small groups. I'm lucky to have a lot of collaboration in my classroom, so most of the time this year I've had at least four adults in my room most of the day. So that really helps. I can split them into groups, kind of according to their abilities

Stephanie further explained that her small group instruction was “leveled direct instruction” based on her students’ reading levels. Stephanie further explained how she used assessment data to form and change those groups based on her students’ changing learning needs. Stephanie also shared that her small group instruction can change. She stated, “So if we can shoot out a quick assessment to them… certain students aren’t grasping something then I can regroup them. They’re really flexible groups.” Tracey from Downs O’ Brien Elementary School also indicated
constructing knowledge about how to personalize learning for her students by putting her students “into a small group” with a teacher where they do “guided instruction and then practice on their own.” From the practice, the teacher reassess the students’ learning and then provides “more guided instruction” based on the students’ needs. The teacher is constantly constructing knowledge about the individualized learning needs of the students in the small group and how to best support their learning to understand a particular concept.

Theme 5: Reflecting - Elementary school teachers make sense of personalizing instructional practices through digital means by reflecting on the successes and challenges of their implementation, as well as determining their needs to improve their implementation.

Sense-making provides a cyclical process that can take teachers from the unknown to action (Coburn, 2001; Jennings, 1996; Shifter & Fosnot, 1993; Smith, 2000, Spillane, 1999; Spillane & Jennings, 1997). The participants constructed knowledge about personalizing learning and digital tools by reflecting on their understanding, collaborating, and implementing practices. Furthermore, through reflecting, teachers are able to identify their successes, challenges and needs to improve the implementation of personalized learning through digital means. Ancona (2012) believed that:

Sense-making often involves moving from the simple to the complex and back again. The move to the complex occurs as new information is collected and new actions are taken. Then as patterns are identified, and new information is labeled and categorized, the complex becomes simple once again, albeit with a higher level of understanding. (p. 4)

By reflecting, teachers were able to apply their new knowledge to their initial understanding of personalized learning to improve their practices. Bridgette from Mt. Willow Elementary School reflected on her practices:
To wrap up the school year, I asked my 4th grade spectrum students to reflect upon what we accomplished this year in our ELT class. We brainstormed a list of projects and activities we did throughout the school year. Through an open discussion and private emails students wrote to me, I discovered what students enjoyed and disliked. Most of my students absolutely loved writing and producing the Ebola movie. I was surprised when many said they wanted an even more active role in producing the movie. One wished she had been able to film or direct the movie. Another wanted to be an editor. Next year, though we may make a film on a different topic, I know to involve students even more in the process. I can take a step back and let them truly take ownership of the film.

Sense-making is considered an on-going process that considers how people notice events, what those events mean, and how created meaning for those events influence behaviors (Miles, 2012). Teachers are able to take their newly constructed knowledge and apply it to further implementations of personalized learning.

**Implications**

The research model used in this study allowed for teachers’ sense-making to be understood within their own school and the culture from which they were a part. Through interviews, journal reflections, and documents a deeper understanding of how the teachers made sense of personalizing instructional practices through digital means was discovered.

**Implications for Future Research**

There are many implications for future research given the findings of the current study. Currently, there is very little to no research on the implementation of personalized digital learning environments examining the sense-making process of teachers and how they construct knowledge about personalizing instructional practices through digital means. This study attempted to address this gap in the research and to add to the body of research on personalized learning in digital learning environments.

At the time of the present study, little research on personalized digital learning environments had been explored and no research involving how teachers make sense of
personalized learning was found. Perhaps using the findings from this study further research will provide a deeper understanding to teachers’ sense-making of personalized learning in digital learning environments.

Since the context of this study was conducted at the elementary school level, future research might include replicating the study with teachers at the middle grades and secondary levels of education. Future research might also consider extending the duration of the study or including a larger number of participants from each school case. Future research might also include the use of observations and shadowing in order to further extend the knowledge about personalized learning.

**Implications for School Leaders**

School leaders may find value in the findings regarding how teachers construct knowledge through collaborating and preparing for personalized learning. Allowing time for teachers to work together in co-constructing the meaning of how to personalize learning for students using digital tools may prove to be worthwhile. Furthermore, many teachers denoted the value in attending professional learning and conferences in order to gain a better understanding of personalized learning with digital tools. Additionally, all but one school indicated the significant role of the media specialist and instructional technology specialist played in supporting the implementation of personalized learning with digital tools. Ensuring that a media specialist and/or instructional technology specialist are readily available and equipped to work alongside teachers would be valuable.

It must be noted that school leadership and the climate of the school can greatly affect teachers’ desire and motivation towards constructing knowledge of a new initiative. All of the participants in the study denoted appreciation for the implementation of the digital tools in their
classrooms; however, they also indicated feeling some level of “pressure” or “expectation” to adopt the one-to-one technology in their classrooms to personalize learning for their students. Furthermore, many felt they may be in some way, penalized, if they were not using digital tools during classroom observations made by site and district administrators.

**Implications for Policymakers**

The need for personalized and innovative learning strategies to improve student motivation and achievement is widespread across the United States (Bray & McClaskey, 2015; U.S. Department of Education, 2010). Education reform has been on the national agenda in America for decades in an effort to improve student achievement (Johanningmeier & Richardson, 2008). One way this need is being addressed is through educational reforms including the creation of personalized digital learning environments for students. However, with this new initiative, there is still much unknown about how to implement and use digital devices effectively to personalize the learning experiences for students. The present study may inform policymakers on how teachers are making sense of the movement in their classrooms in order to help support the direction of the next National Education Technology Plan.

**Concluding Thoughts**

The purpose of this study was to understand how elementary teachers make sense of personalizing instructional practices in digital learning environments. The overall goal was to explore how elementary school teachers made sense and gave meaning to their experiences with personalizing instructional practices for their students using digital means. After 10 weeks of data collection at elementary schools in urban Northeast Georgia, the researcher found 5 influences that impact teacher sense-making, including understanding, collaborating, preparing, implementing, and reflecting.
While each finding influenced teacher sense-making separately, each action also influenced and informed one another. A teacher’s initial understanding served as the foundation of sense-making as it is based on a teacher’s prior knowledge and connections to similar concepts. Collaborating was determined to provide support and resources for teachers to build new knowledge in regard to their personalized instructional practices and uses for digital tools in their classrooms. Preparing was vital as it included teacher motivation to learn, seeking support and resources, and professional learning. The implementing phase is where teachers turned their understanding into action. Finally, reflecting practices were important for as it bridged initial understanding and new learning experiences for the construction of new knowledge.

These findings, while limited, revealed elementary school teachers’ sense-making of personalizing instructional practices through digital means. In this study, differentiated learning + individualized learning + digital means = personalized learning. Despite possible implications for future research, the intentions of this study were achieved and contribute, albeit on a small scale, to the body of knowledge about personalized learning, the digital learning environment, and sense-making. Additionally, the findings of this research pave the way for additional study of sense-making as elementary school teachers continue to implement personalized learning in digital learning environments in schools.
REFERENCES


Audiovisual Instruction, 13, 232 – 237.


APPENDICES

Appendix A: Semi-Structured Interview Protocol

**Purpose of the Study:** The overall purpose of this study is to understand how upper elementary school teachers make sense of how they personalize learning through digital means. This study seeks to understand the steps teachers take and adjustments they make to implement and maintain personalized learning within their classrooms as digital learning environments. Through such a study, the researcher hopes to uncover teacher successes, questions, and needed supports regarding instructional technology aimed at personalizing learning for students.

**Teaching Experience**

1. How many years have you been teaching?
2. How long have you been teaching in upper elementary grades?

**Personalized Learning**

1. Tell me what personalized learning is to you.
2. How do you personalize instruction for your students?
3. What steps do you take to personalize learning for your students?
4. What does personalized instruction look like in your classroom?
5. How often and in what ways do you personalize learning for your students?
6. How do you adjust your instruction to personalized learning for your students?

**Digital Tools**

1. What are your experiences with digital tools in your classroom?
2. How often do you utilize technology for instructional purposes with your students?
3. In what ways have (do) your students use(d) technology for learning?
4. Tell me about your experiences with using digital tools to personalize instruction for your students.
5. What successes have you had with personalized digital learning environments? Why do you think/what made this a success?
6. What are your thoughts and feelings on the use of technology to personalize learning for students?

Changes

1. Describe how your instructional practices changed with the 1-1 digital tools access in your classroom?
2. How has your planning and preparation for instruction changed with the implementation of personalized digital learning environments?

Professional Learning

1. What types of professional learning have you participated in for implementing personalized learning and digital learning environments?
2. What resources do you have access to personalize the instruction and practice for students in your classroom?
3. Tell me about your professional learning experiences with personalized digital learning environments.
4. What are your thoughts on your professional learning experiences with personalized digital learning environments?

Student Connection

1. What changes have you noticed with your students since your implementation of personalized instruction through digital means?
2. How has your students’ learning changed since your implementation of personalized instruction through digital means?
3. In what ways do you believe the one-to-one digital access been beneficial or harmful to your students?

Needs

1. Explain to me what you believe are your needs to improve the implementation of personalized digital learning in your classroom.
2. What resources or professional learning needs do you think would be beneficial to improve your implementation of personalized instruction through digital means?
1. Tell me what personalized learning is to you.

2. Tell me what personalized learning looks like in your classroom.

3. How is technology used in your classroom?

4. How do you use technology to personalize learning for your students?

5. What does it look like when you use technology to personalize learning for your students?

6. How have you adapted your instructional practices with the implementation of personalized learning through digital means?

7. Tell me about your professional learning experiences with personalized digital learning environments.