LIKE A PALM TREE IN A HURRICANE:
A DUAL CASE STUDY OF DIGITAL TEXT IN THE INCLUSIVE CLASSROOM

A Dissertation

by

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This dissertation meets the standards for scope and quality of
Texas A&M University-Corpus Christi and is hereby approved.

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ABSTRACT

This qualitative dual case study with a cross-case comparison explored the attitudes,

beliefs, and intentions of teachers regarding the implementation and use of digital text in the

inclusive classroom. Grounded in Harris, Mishra, and Koehler's (2009) framework of

Technological, Pedagogical, Content Knowledge (TPACK) and Rose and Meyer's (2002)

framework of Universal Design for Learning (UDL) as a blueprint for designing inclusive

classrooms that provide materials and methods, the purpose of this study was to identify how two

teachers in inclusive classrooms located in South Texas, describe their experiences using digital

text for students with learning disabilities. This purpose was also driven by the rationale that

teachers are now required to provide curriculum and instructional delivery in accessible format

to meet the learning needs of a diverse group of students.

The findings indicated that both participants experienced challenges and struggles

integrating digital text into the inclusive classroom. Their individual responses to the challenges

and struggles affected their ability to implement UDL principles into their lesson design, and

maintain the relationship between their TPACK components. The findings also indicated that a

strong collaborative relationship between general education and special education teachers

provided a solid foundation for the delivery of sound instruction that maintained balance

between the TPACK components and created opportunities for learning that engaged and

motivated a diverse population of students.

The implications of this study raises questions about the ways in which special education

and general education teachers are trained both professionally and academically to facilitate a

collaborative relationship within the inclusive classroom. Furthermore, this study raises the

question about the role of campus and district administrators in bringing together a collaborative

relationship between general education and special education teachers.

DEDICATION

"For I know the plans I have for you declares the Lord, plans to prosper you and not harm you, plans to give you hope and a future" Jeremiah 29:11 NIV

To my Lord Jesus Christ who leads me, guides me, forgives me and provides for me every day. This dissertation is dedicated to two special women in my family. To my late grandmother, Mildred Marie Smith, whose drive and determination continues to impresses me. Graduating from college in 1964 at the age of 60, she modeled that it is never too late to follow your dreams. To my late mother, Kathleen Kermmoade, who taught me to believe in myself and to be strong in all aspects of my life. You may not be here with me in person, but you are here every day in my heart. I am who I am today because of the confidence and love my mother showed me as a young woman.

To my biggest cheerleader and husband Miles R. Stanley, thank you for supporting me, having patience with me, and keeping me going when times were rough. You are my strength, my support and the love of my life. Also to my son Bryce, thank you for supporting me and checking up on me in these last few weeks to, make sure mom was ok. I appreciate the time both of you gave me to continue my education and my dream. I hope I have made you both proud to call me your wife and mother.

Lastly, to my church family and educational colleagues, whose encouragement, support, strength, and prayers upheld me and kept my head above water. I appreciate your belief in my ability and the support you gave me on the many sleep deprived days. I hope I can repay the friendships you have gifted to me these years.

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Your beautifully messy complicated story matters – Tell it!
- Kelly Rae Roberts (2013)

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CHAPTER 1: INTRODUCTION

The bell rings and students begin to enter the classroom, one by one. They are high

fiving and talking with each other, sharing stories that happened since they last saw each other.

They eventually sit down at their desks and begin to work, or at least try to get started. The

warm-up activity on the board states, "Read page 24 and be able to summarize and discuss. You

have 10 minutes." Most students start working, but one boy starts to doodle perhaps to hide the

panic he suddenly feels from the instruction on the board. As much as he tries, the words on the

page do not make sense to him. He simply does not understand Page 24 might as well be in a

foreign language or be a blank page and it would have the same effect on the boy. It is as if he

wants to ask, "What is on page 24?" in his utter confusion. Except he does not, instead, he

slumps down, feeling defeated by the encrypted page 24, shrinking lower in his chair as if to

make himself invisible so the teacher will not notice him.

Background and Setting

A snapshot of today's public education classroom depicts a diverse student population,

filled with various social, economic, and language backgrounds. In addition, distinct populations

of students with learning, physical, and cognitive disabilities are included (Stahl et al., 2010).

Educating students with disabilities became a focus of public education in 1975 with the passage

of PL 94-142, the Education for All Handicapped Children Act (EAHCA). Children with

disabilities were given the right to a Free Appropriate Public Education (FAPE) in the "Least

Restrictive Environment (LRE)… to ensure that all students with disabilities had access to

special education and related services designed to meet their unique needs" (Karger, 2005, p. 5).

This approach brought awareness to the concept that special education students require specific,

specialized instruction based on individual student strengths and weaknesses as outlined in

federal laws and guidelines. The law was reauthorized several times; in 1990, it was renamed the Individuals with Disabilities Education Act (IDEA).

In 1997, the reauthorization of IDEA made attempts to address the problems found in the 1990 authorization of IDEA. This was the first time Congress included access to the general curriculum in IDEA (Individuals with Disabilities Education Act [IDEA], 2001). Four years later, Congress passed the No Child Left Behind Act of 2001(NCLB), with the purpose of promoting equal opportunities for all children to receive a high-quality education and attain proficiency, at a minimum, on challenging state achievement standards and state assessments (No Child Left Behind [NCLB], 2001). NCLB included several requirements that have an impact on students with disabilities and their involvement in the general curriculum (Karger, 2005). The shift has started from all students having access to the general curriculum toward access to and academic achievement in the general curriculum.

Working to continue improvements, which would improve students' access the general curriculum, Congress, state legislatures, and educational agencies, in conjunction with the Association of American Publishers (AAP), drafted and obtained the introduction of H.R. 490, Instructional Materials Accessibility Act (Adler, 2002). The bill promoted one standard digital format to make textbooks accessible. The bill also proposed to set aside one million dollars to create a central repository called the National Instructional Materials Access Center (NIMAC), which would allow for easier and faster access to these materials. A well-organized system for acquiring and distributing instructional materials in an assortment of specialized formats, including Braille, synthesized speech, digital text, digital audio, and large print was proposed (Perl, 2002). The Instructional Materials Accessibility Act (IMAA) was incorporated into the reauthorization of IDEA 2004, and the standard digital format, National Instructional Materials

Accessibility Standard (NIMAS) became effective on July 1, 2005 (Hoffman, Hartley, Boone, & Raskind, 2005). With the reauthorization of IDEA 2004, the inclusion of the Instructional Materials Accessibility Act (IMAA), development of the National Instructional Materials Accessibility Standard (NIMAS), and the coordination of the National Instructional Materials Access Center (NIMAC), students with print disabilities have the hope of accessible text in the classroom.

The reauthorization of IDEA in 2004 places a new emphasis on students' with disabilities access to the general education curriculum. IDEA mandates that students with disabilities be educated in the Least Restrictive Environment (LRE), which is with their non-disabled peers to the greatest extent possible. While LRE is not a new consideration under IDEA 2004, it did have new implications. Language from IDEA 1997 was preserved in some aspects and yet expanded and changed in other areas. Individuals with Disabilities Education Act (IDEA, 2004) replaces the term *general curriculum* with *general education curriculum*, with clarification that all students, with or without disabilities, should receive the same curriculum in the same classroom. With the addition of the term general education curriculum, "IDEA 2004 calls attention to the important relationship between access to the general education curriculum and placement in the regular classroom, highlighting the strong preference of IDEA for education in the LRE" (Karger, 2005, p. 5). Students' LRE considerations must reflect the accommodations and supports needed to ensure progress in the general curriculum. The majority of the school population can easily access the curriculum. However, the general curriculum is simply not designed for students with disabilities and it is argued that "students find barriers rather than supports for learning" (Hitchcock & Stahl, 2003, p. 45). Individual learning styles, accommodations, and individual student needs are not addressed through traditional methods.

Students with disabilities require traditional methods to be modified and adapted to meet their needs. While schools provide accommodations and modifications to improve student learning, the materials and resources provided are not always designed for universal access. Curricular materials are designed for the status quo with occasional side-bars to provide suggestions for accommodating lessons. Yet individualization is not without its own issues either, especially when "one critical barrier to individualizing instruction is the curriculum itself. Rather than offering multiple gateways to learning and understanding, the 'one size fits all' printed textbooks and other resources that make up the general curriculum often serve as barriers" (Stahl, 2009, p. 2). An accessible curriculum provides the needed accommodations and supports, such as digital text, in an attempt to break through these barriers. Providing digital text for students with disabilities grants the access to the general education curriculum that enables students to be participants in the classroom, not just visitors.

Leading the charge for new technological advances in education, the Center for Applied Special Technologies (CAST) was formed in 1984 by a small group of educational researchers. Their purpose has evolved to explore ways of using new technology to enhance the educational experience of students with disabilities (CAST, 2010, para 2). As a major leader in educational technologies for students with disabilities, CAST introduced the Universal Design for Learning (UDL) principles in 1998. The reauthorization of IDEA (2004) brought CAST to the forefront of the Accessible Instructional Material (AIM) initiative. Center for Applied Special Technologies was awarded a grant, from the US Department of Education (DOE) in 2004, to advance the application of the NIMAS standard. From 2007 – 2009, CAST, through a grant provided by the DOE, Office of Special Education Programs (OSEP), initiated a fifteen state AIM Consortium. In a press release in 2007, CAST and the DOE released the following consortium's goals:

(a) Help states develop systems for identifying, acquiring, and using accessible instructional materials;

(b) Ensure that state systems for identifying, acquiring, and using accessible instructional materials employ high quality procedures and practices; and

(c) Produce related products and services scalable and made available to all U.S. states and territories, thus contributing to nationwide efforts to improve academic outcomes for all students with disabilities. (para. 5)

The consortium's purpose is to assist states in putting into place effective systems and practices that will provide students with disabilities the accessible materials needed to make progress in their education (CAST, 2007). Through the AIM consortium's work, CAST developed a series of quality indicators called the AIM Quality Indicators Components. In 2011, CAST began the Targeted Technical Assistance (TTA) program. The TTA program includes a membership of ten states which are supported through the program in the usage of the AIM quality indicators and other resources available through CAST (Zabala, 2012). Access to these resources is granted to all states, however, as Zabala communicated, the ten states involved in the TTA program share a close relationship with the AIM center as they work to implement accessible materials throughout their states.

Access to text in the general education classroom can be a major obstacle to student success. (Jackson, 2004), states that in order to make quality education accessible to all, the curriculum must be examined; "Failure to examine the curriculum and to consider modifications to it presents a crucial question: are the problems confronting public schools today rooted in the students or in the curriculum?" (Jackson, 2004, p. viii). In fact, Jackson (2004) maintains that the problem lies with the static representation of the text and curriculum. To meet the challenge

of educating students with disabilities who are not mastering needed skills, it falls on educational researchers to look beyond the student to examine the curricular foundation of instruction. Through this examination one could seek to improve student progress in the general education curriculum.

Rationale

Research on the use of digital text in the inclusive classroom has focused on classroom interactions between the teacher and student, emphasis on student achievement, and the process of obtaining digital text (Cavanaugh, 2006; Higgins & Raskind, 2005; McFall, Dershem, & Davis, 2006). While necessary, obtaining digital text is not the final step toward the integration. Gaining access to and obtaining digital text by the school does not assure students have access or the instruction on how to get the most from this resource. Educators must evaluate and design instruction to build in access for all students. Burgstahler (2007) suggests a plan designed for making curriculum accessible. Begin by "selecting appropriate strategies and then applying universal design to each activity" (Burgstahler, 2007, p. 38). Universal Design (UD) and Universal Design for Learning (UDL) embed technologies and differentiation into the curriculum which engage all learning styles. Burgstahler (2007) cautions, simply including universally designed activities in the classroom may not meet the specific needs of students with disabilities. For the curriculum to be accessible, supports, which ensure student involvement and progress, may be necessary. Additional planning to include supports, such as assistive technologies, is indispensable. Assistive Technology (AT) provides accommodations to the curriculum that can provide access for students with specific needs.

With increasing diverse student populations, today's educators are faced with the challenge of designing and implementing lessons that reach all students. The percentage of

students served under IDEA has risen since 2000, with the percentage of student spending greater than eighty percent of the day in the regular classroom rising from 47% in 2000 to 60.5% in 2010 (Education, 2010). Edyburn (2010) looking forward to the second decade of UDL, asked if the daily demands of instruction allows educators the time and effort needed to effectively design instruction with UDL principles in mind. No Child Left Behind and IDEA 2004 have given classroom teachers an increased responsibility to implement accommodations and support all students. In addition to their current duties, teachers are given limited support, training and planning time. Therefore, "as we probe new ways of increasing access to the general curriculum for students with disabilities, we will need to remain mindful of how teachers carry out their practices in real life contexts" (Jackson, Koziol & Rudowitz, 2001, p. 7). This research examined the experiences of inclusive classroom teachers and their efforts to implement accessible instructional materials, in the form of digital text, to students with learning disabilities.

<div align="center">**Research Purpose and Questions**</div>

The purpose of this research was to identify how two teachers in inclusive classrooms located in South Texas describe their experiences using digital text for students with learning disabilities.

Two research questions guided the study:

1. What are the experiences of the participant in using digital text in the inclusive classroom?

2. In what ways does the participant describe the various digital text resources they use in the inclusive classroom?

Operationalization of Constructs

The following terms are defined for clarity of use in this study.

Accessible Instructional Materials – Specialized formats of instructional materials that can be used with and by students with print disabilities (NIMAC, 2011).

Assistive Technology (AT) – Refers to "any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of a child with a disability" (IDEA, 2004). (IDEA, "Individuals)

Digital text - Digital version of text presented in the following file formats: PDF, HTML, DAISY 3, NIMAS, TXT, RTF, OPF, hypermedia, and internet.

Inclusive classroom - A classroom in which students with disabilities are supported in chronologically age-appropriate general education classes in their home schools and receive the specialized instruction delineated by their individualized education programs (IEP's) within the context of the core curriculum and general class activities (Ferguson, 1993).

Learning disability - A heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical skills (Disabilities, 1998).

Perceptions - The everyday experiences and attitudes of classroom teachers toward digital text including availability, accessibility, available resources, and observations of student usage.

Support(s) – The services provided by a campus or district that focus on student achievement. This includes but is not limited to: accessible instructional materials, assistive technology, curriculum access, behavior intervention, and specially designed instruction.

Universal Design for Learning (UDL) - a theory of learning and teaching based on neuroanatomical and functional neuroimaging research techniques (NIMAC, 2011).

Methodological Framework

This study focused on how two K-12 teachers described their experiences and personal beliefs regarding the use of accessible instructional materials in the inclusive classroom. Moving toward an understanding of how teachers view their roles in working with technology and students with disabilities lends itself to qualitative research. The reason for selecting this form of inquiry is because, "qualitative research is a situated activity that locates the observer in the world…qualitative researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them" (Denzin & Lincoln, 2008, p. 4). Using this approach has given an in-depth understanding of the ways teachers make meaning of their role in implementing digital text in an inclusive classroom. These meanings were explored through the methodological approach of symbolic interpretivism.

The symbolic interpretivist approach to understanding social realities is founded in the works of George Herbert Mead (1863-1931). Symbolic interpretivism views humans as social beings. Mead suggested that individuals and society are indivisible, each being created through social interaction and recognized in terms of each other (as cited in Burbank & Martins, 2010). Mead's contrasts were predated by Wilhelm Dilthey (1833-1911). Dilthey contrasted understanding and explaining by suggesting "that natural reality and social reality are in themselves different kinds of reality and their investigation therefore requires different methods" (as cited in Crotty, 2004, p. 67). To understand experiences and feelings of participants grounded in the meanings attached to different situations requires methods that will bring out implications deep within experiences. Symbolic Interpretivism has been used by researchers to

understand the meanings derived from the experiences of human beings as they interact with their world. Symbolic Interpretivism may be "characterized as the belief that facts are not things out in some objective world waiting to be discovered, but, rather, are the social constructions of humans who apprehend the world through interpretive activity" (Ferguson, 1993, p. 36). Focusing on the meanings and values placed on integrating technology as a means to access the curriculum for students with disabilities yielded meaningful findings, which others may find transferable.

Symbolic Interpretivism encompasses a wide variety of methodological approaches, from ethnography to ethnomethodology, to discourse analysis to naturalistic inquiry, to phenomenology to hermeneutics (Ferguson, 1993). Because of the increasing emphasis on the Individuals with Disabilities Education Act of 2004 (IDEA, 2004) on students with disabilities accessing the general curriculum (Karger, 2005, p. 5), this study's focus on teachers' experiences using accessible instructional materials in inclusive classrooms for students with disabilities fit well in the research framework of symbolic interpretivism. As Creswell (2007) claimed that the researcher's intent, then, is to make sense of (or interpret) the meanings others have about the world. The end goal was to highlight issues informing the integration of accessible instructional materials into the inclusive classroom so that other teachers may become empowered to navigate beyond the constraints placed upon education and may move beyond that which disadvantages and excludes students with disabilities.

Understanding the experiences of the classroom teacher in serving students with disabilities in inclusive settings was well aligned with case study research. Case study methodology allowed the researcher to go deep into the experiences of two inclusive classroom teachers as they integrated digital text. Case studies have been defined as an intrinsic, holistic

description and analysis of a single instance, phenomenon, or social unit (Merriam, 1998). According to Crotty (2004), different ways of viewing the world shape different ways of researching the world (p. 66). A case study approach was advantageous in this situation because it allowed the exploration of answers to how and why questions, while taking into consideration how the phenomenon was influenced by the context within which it was situated (Baxter, 2008). According to Tellis (1997), "case studies are a multi-perspectival analysis" (p.3). Accordingly, I explored many perspectives from the participants and relevant groups and considered the interactions between them. This approach offered the opportunity to observe the integration of digital text into an inclusive classroom and to describe the experiences of the classroom teacher in this context.

Fidel (1984) identifies three conditions that support case study as a research method "a) large variety of factors and relationships are included, b) no basic laws exist to determine what factors are important, and c) when the factors and relationships can be observed" (p. 273). In this study, the feelings, perceptions, and experiences of teachers have been examined. To develop an in-depth understanding, a variety of data collection methods were used including interviews, a survey regarding Technological Pedagogical and Content Knowledge (TPACK), participant journaling, archival data, and classroom observations. Additional data sources included researcher journals, bracketing interviews, member checks, and peer debriefing. These data collection strategies provided the ways to understand various aspects of the participants' experiences in this study. Participants were selected through a purposeful selection process based on their special experience, knowledge, and ability to provide meaning to the research purpose. Disabilities manifest themselves differently and therefore provide challenges to

classroom teachers. The data collection techniques of the case studies strived to understand these challenges and bring to life the struggles and successes of the participant.

Substantive/Theoretical Frameworks

Two theoretical frameworks, Universal Design for Learning (UDL) and Technological Pedagogical and Content Knowledge (TPACK), informed this study. The framework of UDL advocates the use of technologies in educational curriculum to expand learning and meet the needs of all students. The framework of TPACK (Harris et al., 2009) gives emphasis to the relationship between technological knowledge with solid pedagogical and content area knowledge (Koehler & Mishra, 2009). I offer a brief explanation of these frameworks in this chapter, however, a more detailed discussion is given in Chapter 2.

Universal Design for Learning

Universal Design for Learning is a framework for teaching and learning that takes advantage of modern technology's power and flexibility to address the needs of a wide range of students (Rose & Gravel, 2010b). Universal Design for Learning provides the blueprint for designing inclusive classrooms that provide materials and methods that accommodate the curriculum for diverse learners. A universally-designed curriculum offers the following:

> Multiple means of representation to give learners various ways of acquiring information and knowledge. Multiple means of action and expression to provide learners alternatives for demonstrating what they know. And multiple means of engagement to tap into learners' interests, challenge them appropriately, and motivate them to learn. (Edyburn, 2005, p. 17)

Universally designed lessons replace the rigid fixed instructional materials of traditional lessons with lessons filled with materials that address all learning styles and response modalities.

Students have access to curriculum and text they have never had the chance to experience. Universally designed curriculums keep academic standards consistent for all students, even for those who require accommodations (Burgstahler, 2007). Universally designed lessons do not replace nor release the teacher from providing the necessary accommodations needed by students. Accommodations, such as digital text, grant students access as well as the opportunity to progress in the general education classroom. Providing multiple means of representation, expression, and engagement through materials and methods offer equitable possibilities of success for all students.

Technological Pedagogical and Content Knowledge

Technological Pedagogical and Content Knowledge is a "framework to understand teachers' knowledge required for effective technology integration, emphasizing connections among technologies, curriculum content, and specific pedagogical approaches" (Harris et al., 2009, p. 396). Additionally, it is a framework through which one can acquire the knowledge and skills necessary for successful technology integration. Harris et al (2009) suggest using the TPACK framework as a way to design effective technology integration. Successful integration of digital text in the inclusive classroom for students with disabilities requires teachers to have an adequate knowledge of assistive and instructional technology (Wagner, Newman, Cameto, & Levine, 2006). Assistive technology (AT) was integrated in the TPACK framework by Marino, Sameshima, and Beecher (2009) with the distinct goal of "promoting access, participation, and learning for students with learning disabilities who receive the majority of their instruction in general education classrooms" (p. 188). The Universal Design for Learning framework uses advantages of modern technology to design accessible materials to meet the needs of students

with disabilities and the integration of AT in TPACK facilitates the integration of technological accommodations in the inclusive classroom.

Limitations

The results of this study are limited by the time and resources available to the researcher and participants. This study is reflective of the researcher's ability to gain trust and establish rapport with both participants. Participants were selected from a South Texas school district based on specific criteria. Being a novice researcher, I anticipated certain apprehensions regarding my research skills, however, through support from my peers and mentors I was able to move past these apprehensions.

Additionally, although the broader definition of accessible instructional materials includes many formats, this study was specifically limited to the use of digital text. I was mindful of my strong personal beliefs regarding the inclusion of students with learning disabilities in the general curriculum. The use of digital text to ensure an accessible curriculum is a project I have been deeply involved with in my daily work. It is important to note that the south Texas school district selected in this study has supported the implementation of digital text through the acquisition of district site licenses for software such as text-to-speech, talking word processors and other writing supports, which are available on every campus, as well as training. I was pleased to find that the beliefs and feelings of my participants closely mirrored my own. Keeping my personal beliefs in mind, I remained open to the experiences and beliefs of those who participated in the study. I conducted regular checks with the participants, my peers, and my mentor to remain vigilant of my personal investment and to ensure academic trustworthiness of this work. I do not claim to present the absolute truth or truth of any fixed kind in this study. I present what I am able to interpret and co-create with the participants as narratives using our

collaborative cognitive filters. The readers are encouraged to create their own entry points with their sensibilities and vigilance to determine the rigor of this study.

Significance of the Study

The Individuals with Disabilities Education Act of 2004 promised access to the general classroom with the expectation of adequate progress in the curriculum. Accessible instructional materials make the general curriculum available to students with disabilities. However, "paper-based instructional technologies (e.g., worksheets, textbooks) commit information to fixed formats and cannot match the array and flexibility of supports provided in a digital environment" (Edyburn, 2010, p. 6). Increased support provided by digital text opens the general classroom to all students. Implementing the use of digital text, in the inclusive classroom, grants students with disabilities access to the classroom and the curriculum.

By examining the experiences of classroom teachers' usage of digital text in the inclusive classroom, this study has contributed to the field of education through a greater understanding of how teachers carry out the daily demands of teaching to a diverse population. A significant benefit to the participants was the opportunity to examine their classroom practices and become informed as to how their teaching strategies improved student access to the general curriculum. This study creates a space for teachers to express their accommodations and resistances to the pressures of legal mandates and how they negotiate such demands with their passion for teaching.

Additionally, the findings of this study have significance for district and campus level administration. This study may inform district and campus administrators as they make decisions regarding professional and curriculum development. As educators strive to meet the needs of all students, understanding the experiences of teachers' implementation of digital text

provides an opportunity to examine the roles of district and campus administrators as well as teachers. Therefore, this study may also be of significance to district level administrators as they develop systems to support the implementation of accessible instructional materials in the classroom.

CHAPTER 2: LITERATURE REVIEW

In this chapter, I discuss the historical background of the development of accessible instructional materials, two theoretical frameworks, their application to the integration of digital text in the inclusive classroom, and empirical studies on the use and application of digital text in education. The purpose behind such discussion is to ground the study in appropriate theoretical, historical, and empirical context so that arguments can be made about how the current study can contribute to the ongoing dialogue regarding the teacher's role and abilities integrating digital text, or open up new spaces for dialogue in the field of accessible instructional materials.

Accessible Instructional Materials a Historical Perspective

As mentioned in chapter one, the reauthorization of IDEA 2004 as well as NCLB have brought about legal changes and mandates regarding the access of students with disabilities to the general curriculum and the accessible materials used therein (Edyburn, 2010). The magnitude of the additions regarding accessible instructional materials in IDEA 2004 can be understood through looking at the historical milestones in the acquisition of accessible text.

Historically, students who needed help accessing printed books were provided retrofitted resources in multiple formats, such as in Braille, large print, audio books, rewritten text with simplified language, and underlining text in textbooks (Strangman & Hall, 2003). Retrofitted instructional materials include materials that are altered from their original print format, in order to be accessible to students (Stahl et al., 2007). (Lee, Thompson, Herzberg, Derkel, & Mayo, 2011), point out that these formats are not always convenient for the learner; for instance the size of Brailed text books can become quite large and daunting, taking up to one year, and about $2,000 dollars to produce. Other limitations may include students with learning disabilities who require specialized digital files that are accessible by text readers in order to access their

curriculum (Karger, 2010). Digital files are available from some publishers in limited subjects, however, when digital files are not usable or available from publishers, local scanning is usually employed (Bowes III, 2005). Creating a digital version of a text book requires the scanning process, referred to as *chop and scan*, where school districts purchase the textbook, chop the binding off, scan each page with a duplex scanner, edit in optical character recognition (OCR) software to make corrections as well as correctly tag photos and graphics (Burgess, 2011), which may take up to six months to a year to complete. The complex task of scanning a textbook along with the legal problems of copyright issues is beyond the abilities of many classroom teachers (Bowes III, 2005). Large districts and even State Education Agencies (SEA) hire staff to *chop and scan* textbooks spending $36,000 to $3,250,000 annually (Wall & Corn, 2002). Wall and Corn (2002) state that, even with these costly efforts, providing the accessible digital text takes excessive time and may produce low quality materials. Therefore, educators look to new technologies for improvements in providing accessible instructional materials.

The digital age has brought new resources and tools that can make materials accessible to students with disabilities. According to (Strangman & Hall, 2003), electronic text once converted may be formatted for text-to-speech, embedded with hypertext, or modified into audio formats. Descriptions of some of the prevalent sources of modified accessible text currently available, as stated by Stahl, Hitchcock, Hendricks, Johnson, Christensen, and Siller (2010) are as follows:

Braille- the acquisition of Braille version of print resources is one of the most significant challenges for addressing the needs for students with visual disabilities. Providing the Braille text when the printed text is given to students is unpredictable and highly costly.

Audio – As technology advances, audio recordings of textbooks has become more accessible. Digital audio files with embedded navigation supports are known as Digital Talking Books (DTBs) or DAISY[HL45] books. DAISY files are the standard for recorded books for many companies providing these materials.

E-Text- Electronic text or e-text has become a selected format for many students and a necessary format for most students with print disabilities. At the current time, e-text versions of print instructional materials may be obtained from four chief sources: publishers, organizations producing e-text for print-disabled students, the Internet, or from a printed work via scanning. (pp.12-15)

Using any of these methods, books can be produced in digital formats that can be processed by special devices and/or software and presented in ways that are configurable to the needs of individual students (Bowes III, 2005). However, supporting software for digital text varies, and the file formats that are supported by the software vary from one product to another. The most common file formats that text may be produced in or converted to are PDF's, Rich Text Format (RTF), HTML, and DAISY file formats (Stahl, 2009). New technologies provide the means by which publishers and educators can produce and convert text, however the quality and functionality of text may not be appropriate for students to access (Wall & Corn, 2002). Continued enhancements to technology provide the promise of access to the general curriculum through quality accessible text.

A barrier to accessible text lies within the copyright protections granted to publishers. Passage of the Chafee amendment to the copyright law in 1996 provided relief to state and local education agencies (LEA) by allowing nonprofit organizations or governmental agencies to provide alternative accessible copies of previously published non-dramatic literary works in

specialized formats exclusively for use by blind or other persons with print disabilities (Stahl, 2009). The Chafee amendment (1996) defines qualifying print disabilities as a) students with visual impairments such as blindness and dyslexia, b) physical disabilities that limit access to printed materials and, c) learning disabilities that are organic in diagnosis. Prior to the Chafee amendment, LEAs were required to obtain permission from the copyright holder in order to distribute publications in alternate formats (Lingane & Fruchterman, 2003). With the permissions granted by the Chafee amendment LEAs may legally provide alternate formats of instructional materials for students with print disabilities without seeking permission from the copyright holder.

The allowances offered through the Chafee amendment and development of new technologies has created a favorable environment for the provisions of accessible text (Adler, 2002). Consequently, the movement to capture the power of new technology to promote rapid, accurate and effective improvements in accessible materials has resulted in the inclusion of accessible materials in the reauthorization of IDEA 2004 (Stahl et al., 2007). As a result, Congress, state legislatures, educational agencies, and the American Association of Publishers (AAP) had a part in drafting and obtaining the House and Senate introduction of H.R. 490, Instructional Materials Accessibility Act (Adler, 2002). The bill proposed to create a well-organized system for acquiring and distributing instructional materials in an assortment of specialized formats, including Braille, synthesized speech, digital text, digital audio, and large print (Perl, 2002). The bill also proposed that one standard digital format be established to make text books accessible. Currently, no standard file format exists, resulting in districts receiving text in a variety of formats that may or may not be accessible with current technologies. According to Perl (2002), the bill also proposed that $1 million be set aside to create a central

depository called the National Instructional Materials Access Center (NIMAC) for easier and faster access to these materials. State and local school districts that receive federal funding would have two years to make sure visually impaired students could access all educational materials at the same time as their peers. Textbook publishers would be required to submit digital files of all textbooks according to a universal standard, making it easier for schools to convert instructional materials into accessible formats (Adler, 2002). Textbook publishers would also have to provide schools with a written agreement that states they agree to submit an digital format of text books within 30 days to the NIMAC (Perl, 2002). Key elements of H.R. 490, the Instructional Materials Accessibility Act, proposed in the 108th Congress, while not enacted, were sent to the subcommittee on education reform and incorporated into the final version of the Individuals with Disabilities Education Act, 2004 (Karger, 2005). Through collaboration and legislative support, a common file format was agreed upon and included in the reauthorization of IDEA 2004.

With the reauthorization of IDEA 2004, the National Instructional Materials Accessibility Standard (NIMAS) was developed and the coordination of the National Instructional Materials Access Center (NIMAC) was completed (Karger, 2010). As detailed in the National Instructional Materials Accessibility Standard (2005), the duties of NIMAC are: (a) to receive and maintain a catalog of print instructional materials prepared in NIMAS, as established by the secretary, made available to NIMAC by the textbook publishing industry, SEAs and LEAs; (b) to provide access to print instructional materials, including textbooks, in accessible media, free of charge, to blind or other persons with print disabilities in elementary schools and secondary schools in accordance with such terms and procedures as the NIMAC may prescribe; and (c) to develop, adopt and publish procedures to protect against copyright infringement, with respect to

the print instructional materials provided under Sections 612(a)(23) and 613(a)(6). NIMAC has

provided State Education Agencies (SEA) and LEA's the opportunity to access alternate formats

of instructional materials through authorized agencies. With access to digital text granted, LEAs

and SEAs have moved on to the next step toward student access and integration into the

classroom. Before accessible text is delivered to students many steps must take place for

implementation. In order to meet the needs of students with print disabilities and satisfy the

Figure 1. Process SEA's and LEA's may take to work with NIMAC. Taken from National
Dissemination Center for Children with Disabilities training module IDEA 2004, Building the
legacy, module 8. Copyright free

NIMAS legislation, NIMAC has determined that State Education Agencies must register or

agree to coordinate with NIMAC. It is not required that states coordinate with NIMAC however, states may choose to develop state regulations on accessible instructional materials to comply with IDEA 2004 and not coordinate with NIMAC. Working with NIMAC takes the steps shown in Figure 1.

States choosing to work with NIMAC are given the rights to go through an authorized entity to obtain accessible materials. The Chafee amendment defines authorized entities as: "a nonprofit organization or a governmental agency that has a primary mission to provide specialized services relating to training, education, or adaptive reading or information access needs of blind or other persons with disabilities" (Copyright law amendment, 1996, sec. 121, c).

States choosing not to work with NIMAC must make assurances that they will provide accessible materials to students with blindness and other with print disabilities (National Instructional Materials Access Center, 2006). States have the option to: a) purchase available source files directly from publishers and utilize these files to produce student-ready, specialized formats, b) purchase available student-ready versions directly from publishers, and c) establish a workflow for scanning print materials and self-producing appropriate specialized formats (Stahl, 2009). Regardless of the path a state takes to obtain accessible instructional materials, states must ensure that all LEAs provide instructional materials in accessible formats for children with disabilities who need these materials at the same time as non-disabled students (NIMAS, 2007). State education agencies and LEA's are held responsible for providing accessible materials to all students with disabilities who need these accommodations. Karger, (2010) emphasizes that comments accompanying IDEA regulations of NIMAS and NIMAC state that "timely access to appropriate and accessible instructional materials is an inherent component of [an LEA's/SEA's] obligation to ensure a Free and Appropriate Public Education is available" (p.4). However, the

relief the Chafee amendment gives to copyright regulations does extend itself to students with disabilities that do not qualify as having a print disability.

For students who do qualify under the Chafee amendment, the development of a standard file format, NIMAS, and a center to assist states in acquiring accessible materials, NIMAC, accessible instructional materials are becoming increasingly available (Stahl et al., 2010). The National Instructional Materials Access Center (NIMAC) has given the support needed for states to meet the needs of blind students and students with print disabilities. However, NIMAC is not able to support states in providing accessible materials for all students with disabilities that need these accommodations (Karger, 2010). As a result it is up to individual states to put the necessary statements into textbook contracts to force publishers to provide accessible instructional materials that can be utilized by all students regardless of their disability (Stahl, 2009). Consequently, the number of publishers providing e-text of printed materials is increasing. This is the preferable method as (Stahl et al., 2010) state:

> Even though NIMAS source files represent an alternative to print versions, they are
>
> created by content developers as a part of an overall product, and they represent a
>
> more efficient and accurate approach than having to retro-fit a print work at the
>
> classroom or school level. (p.5)

Stahl et al (2007), envision a future where these alternate formats are embedded in the universal design of the curriculum to make accessible materials available in a timely manner promoting learning for all students.

The Chafee amendment provides an "inadequate foundation for the large scale provision of alternate format materials for students with print disabilities, simply because it was designed to meet the needs of a small subset of individuals on a case-by-case basis" (Stahl, 2009, p. 7).

Students with non-visual print disabilities, e.g., learning disabilities, constitute a much larger population than those with visual impairments, and the need to serve this much larger population is stimulating a rapidly growing demand for digital formats (Bowes III, 2005). The requirement to provide accessible instructional materials is a welcomed change. However, it is yet to be seen how curriculum developers and textbook publishers arise to the challenge (Strangman & Hall, 2003). Currently, the burden lies on the teacher's shoulders to create universally designed lessons that integrate technology and make text accessible for all students with learning disabilities, not just those with qualifying print disabilities (Karger, 2005). The provision granted through the Chafee amendment is not adequate to fulfill the requirements of IDEA 2004 due to the limited population that may be served verses the greater need.

The legislation regarding print materials has led to a transition from print to digital text and the implementation of Universal Design for Learning principles in lieu of retro-fitting the curriculum. These new principles, as they apply to teachers' integration of digital text and media in the classroom, are discussed further in this chapter.

Substantive/Theoretical Frameworks

Given that this study is about how teachers describe their perceptions about using digital text for students with learning disabilities, two substantive frameworks inform this study. These frameworks are Universal Design for Learning (UDL) and the Technological Pedagogical and Content Knowledge (TPACK) (Harris, Mishra, & Koehler, 2009). Universal Design for Learning is a framework for teaching and learning that focuses on the power and flexibility of modern technologies to address the varying needs of students (Rose & Gravel, 2010). The TPACK framework emphasizes the integration of appropriate technological knowledge with pedagogical and content area knowledge (Koehler & Mishra, 2009). The appropriate design and

integration of technology into the curriculum, rather than retrofitting as an aside to the curriculum, facilitates the use of various technologies to address the academic needs of all students. Therefore, blending the TPACK framework with the principles of UDL in curriculum planning allows for the successful integration of technology throughout the content areas.

Universal Design for Learning (UDL)

The constant and continual improvements in technology have created a rich environment in which educators may take advantage of the power and flexibility that digital tools and content offer (Meyer & Rose, 2005). Effective teaching does not result from one particular method or approach but from a teacher's complex knowledge and concern that focuses attention on the academic, behavioral, emotional needs of individual students (Hitchcock & Stahl, 2003). Universal Design for Learning, as pointed out by Meyer and Rose (2005), takes into account the nature of learner differences, capabilities of new media, and the most effective teaching practices to address the diverse needs of today's students. Universal Design for Learning was defined in the Higher Education Opportunity Act (2008), ("Higher Education Opportunity Act ") as a scientifically valid framework for guiding educational practice that:

- provides flexibility in the ways information is presented, in the ways students respond or demonstrate knowledge and skills, and in the ways students are engaged; and
- reduces barriers in instruction, provides appropriate accommodations, supports, and challenges, and maintains high achievement expectations for all students, including students with disabilities and students who are limited English proficient. (p.10)

Universal Design for Learning identifies and removes barriers from traditional teaching methods and materials (Meyer & Rose, 2005; Rose & Strangman, 2007). Universal Design for Learning is a framework that promotes access to the curriculum and learning for everyone.

The principles of Universal Design for Learning originated from the concepts of Universal Design in the field of architecture (Pisha & Coyne, 2001). Formulated by Ron Mace at North Carolina State University, the goal for Universal Design is to create structures that are conceived, designed, and constructed to accommodate the largest number of users without the need for subsequent adaptation, retrofitting or specialized design (Hitchcock & Stahl, 2003; Pisha & Coyne, 2001; Rose & Meyer, 2002; Spencer, 2011). Considering the needs of people with disabilities in the design phase, by creating access for wheelchairs, universal door handles, and visual cues, allows for greater access independence for all people to public places.

As Rose and Meyer (2002) recall, prior to the Universal Design movement, many building designs were inaccessible to individuals with disabilities and architects seldom addressed the needs of people with disabilities. Legislation mandating access for all led to extensive retrofitting with ramps, elevators, talking signs, adapted door handles, and other accessible devices (Stahl, 2009). The Universal Design concept promotes the inclusion of accommodations in building design from the start by accounting for the needs of all people from the beginning such as curb cut outs evident in public and private buildings (Pisha & Coyne, 2001). By creating a slight slope in crosswalks and intersections, Universal Design created easy access for people using wheelchairs. Curb cutouts have extended beyond the disabled population to include people with strollers, bicyclists, skateboarders, and workers with roller carts (Meyer & Rose, 2005). The days of retrofitting buildings to accommodate for people with disabilities are coming to an end.

During the late 1990's, the Universal Design concept began to be applied to education (Rose & Meyer, 2002). Starting in the early 1980's, a group of education researchers began the Center for Applied Special Technology (CAST) to explore ways to use new technology to create

improved learning environments for students with disabilities (CAST, 2010). The Center for Applied Special Technology was founded in 1984 with the goal to develop and apply technology to the field of special education so that opportunities for students with disabilities could be expanded (Rose & Meyer, 2002). Through the next few years, CAST introduced accessible digital books and software with embedded supports, so that all students could access text regardless of their learning needs (CAST, 2010). The staff at CAST, working with schools to adapt print-based curriculum and materials to be accessible by all students, quickly applied the Universal Design concepts to learning (Rose & Strangman, 2007). Universal Design for Learning applies the concepts of Universal Design to curriculum in order to create flexible and accessible curriculum for all students.

 Universal Design for Learning incorporates findings from brain and media research to help educators reach and teach all students. The brain is "one large network with many smaller networks that perform different tasks" (CAST, 2011a, slide 14). Universal Design for Learning's framework is founded on the brain research of Lev Vygotsky (1978; 1986). Vygotsky posited that three conditions must be met for learning to occur, the learner must a) recognize patterns in sensory data, b) have one or more strategies for operating on perceived patterns, and c) be engaged both by the strategies and the sensory data to which he or she is applying them. If any of these three conditions are missing, learning will suffer. Improvements in the ability to detect activity in the human brain, such as positron emission tomography (PET) scan technology (Cappa, Pernai, Schnur, Tettamanti, & Fazio, 1998; Taylor et al., 1998), have allowed detailed images of the brain that support Vygotsky's three conditions. Combining Vygotsky's theories and contemporary theories, Meyer and Rose (2005), suggest a triadic approach to guide the development of learning principles. Meyer and Rose (2005) define the

parts of the triadic approach as a) the *Recognition Network* – which enables the brain to identify and understand information, ideas and concepts, b) the *Strategic Network* – which enables the brain to plan, execute and monitor actions, c) the *Affective Network* – which enables the brain to engage with tasks and learning within the environment. Understanding learning through these three networks forms a framework for thinking about learner differences underlining the process around the what, why, and how of learning (CAST, 2009, para. 4). Informed by brain research, the concept Universal Design, their own research, and efforts to make instructional materials accessible, the staff at CAST created the principles of UDL to assist all learners (Meyer & Rose, 2005). Through the work of key scholars at CAST, the key principles for UDL were developed. To clarify and offer a deeper understanding of UDL, the National Center on Universal Design for Learning developed the UDL guidelines 2.0 in 2011 (See Figure 2). Rose and Meyer (2002) gave widespread attention to UDL in their publication, *Teaching Every Student in the Digital Age: Universal Design for Learning,* a work that is considered to be the most definitive work on UDL (Edyburn, 2010). Rose and Meyer (2002) elaborate the UDL principles as: a) provide multiple means of representation, b) provide multiple means of action and expression, c) provide multiple means of engagement (p. 75). In the context of the three UDL principles and guidelines therein, the next sections discuss findings from brain research and their connections to learning.

Multiple Means of Representation. Because all learners process and interpret information in multiple ways, the differences exhibited by students with learning and cognitive disabilities require an alternate approach to content (Meyer & Rose, 2005). The first of the three brain networks, Recognition (Vygotsky & Cole, 1978; Vygotsky & Kozulin, 1986), is where

facts and categorical information are received through seeing, hearing and reading. The first

principle of UDL encompasses the characteristics of the Recognition network, by designing

guidelines for providing multiple means of representation that address each characteristic

(CAST, 2009; Pisha & Coyne, 2001). The first column of Figure 2 details the principle and

Universal Design for Learning Guidelines

I. Provide Multiple Means of **Representation**	II. Provide Multiple Means of **Action and Expression**	III. Provide Multiple Means of **Engagement**
1: Provide options for perception	**4: Provide options for physical action**	**7: Provide options for recruiting interest**
1.1 Offer ways of customizing the display of information	4.1 Vary the methods for response and navigation	7.1 Optimize individual choice and autonomy
1.2 Offer alternatives for auditory information	4.2 Optimize access to tools and assistive technologies	7.2 Optimize relevance, value, and authenticity
1.3 Offer alternatives for visual information		7.3 Minimize threats and distractions
2: Provide options for language, mathematical expressions, and symbols	**5: Provide options for expression and communication**	**8: Provide options for sustaining effort and persisten**
2.1 Clarify vocabulary and symbols	5.1 Use multiple media for communication	8.1 Heighten salience of goals and objectives
2.2 Clarify syntax and structure	5.2 Use multiple tools for construction and composition	8.2 Vary demands and resources to optimize challenge
2.3 Support decoding of text, mathematical notation, and symbols	5.3 Build fluencies with graduated levels of support for practice and performance	8.3 Foster collaboration and community
2.4 Promote understanding across languages		8.4 Increase mastery-oriented feedback
2.5 Illustrate through multiple media		
3: Provide options for comprehension	**6: Provide options for executive functions**	**9: Provide options for self-regulation**
3.1 Activate or supply background knowledge	6.1 Guide appropriate goal-setting	9.1 Promote expectations and beliefs that optimize motivation
3.2. Highlight patterns, critical features, big ideas, and relationships	6.2 Support planning and strategy development	9.2 Facilitate personal coping skills and strategies
3.3 Guide information processing, visualization, and manipulation	6.3 Facilitate managing information and resources	9.3 Develop self-assessment and reflection
3.4 Maximize transfer and generalization	6.4 Enhance capacity for monitoring progress	
Resourceful, knowledgeable learners	**Strategic, goal-directed learners**	**Purposeful, motivated learners**

Figure 2. UDL Guidelines 2.0 graphic organizer.   Reproduced with permission of the publisher.

guidelines for the Recognition Network which is discussed below.

The National Center on Universal Design for Learning (CAST, 2011b), presents the guidelines for the first principle as:

- Provide options for perception. These guidelines focus on access by providing students with ways into the content. To reduce the barriers to learning, it is important to ensure that materials are perceivable to learners. Providing the same information through different modalities (e.g., through vision, hearing, or touch) ensures that materials are perceivable to learners.

- Provide options for language, mathematical expression, and symbols. The understanding of vocabulary and meaning of language and symbols may vary from one learner to the next. Instructional strategies that ensure alternative representations are provided not only for accessibility, but for clarity, and comprehensibility across all learners are recommended.

- Provide options for comprehension. Proper design and presentation of information can allow for differences in information processing and prior knowledge by providing the scaffolds necessary to ensure that all learners can participate in the learning process. (pp.14-22)

Learners differ in how they perceive and comprehend information. In order to reduce the barriers to learning, it is important to ensure that materials are perceivable to learners through accessible language options and expression (Brand, Favazza, & Dalton, 2012; Rose & Strangman, 2007). The use of digital media with embedded supports and text provide alternate forms of representation.

Technology allows educators to provide multiple means of representation through media that may be adapted to meet the needs of students with diversity in perception and comprehension. Digital text is an inherent part of providing options for perception (Strangman & Hall, 2003). Traditional printed text, worksheets, and all paper based materials are not accessible to all students (Stahl et al., 2010). However, digital text is able to offer a range of embedded supports and scaffolds, such as text-to-speech (TTS) capabilities, links to background information, glossaries, and a wide range of expressive tools (Hall, Meyer, & Rose, 2012). Additionally, the provision of digital materials allows students to access curriculum through technology and multimedia. Through the application of UDL principles these materials can become accessible to all students.

Multiple Means of Action and Expression. Providing options for access for those with physical disabilities, creating options for expression to involve all voices and ideas, and creating structure and supports for executive functions encompasses the essence of Multiple Means of Action and Expression (Brand et al., 2012). The second of the three brain networks, Strategic, (Vygotsky & Cole, 1978; Vygotsky & Kozulin, 1986), is the *how* of learning, how we organize and express our ideas. The Strategic Network allows the learner to "plan action and to systematically act on information" (Pisha & Coyne, 2001, p. 198). Tasks such as writing an essay, doing math computations, and organizational skills are examples of strategic brain activity (CAST, 2009). The second principle of UDL, Multiple Means of Action and Expression, encompasses the characteristics of the strategic network by providing alternate strategies for acting upon information, manipulating the environment and expressing knowledge (Meyer & Rose, 2005). The second column of Figure 2 details the principle and guidelines for the Strategic Network. Providing a student the choice to express learning through multimedia or writing

supports are examples of the application of this principle (Strangman & Hall, 2003). Alternate means to interact with software, such as touch screen monitors and voice activated applications are ways in which classrooms can ensure all access for all students. The guidelines presented by the National Center on Universal Design for Learning (CAST, 2011b) assist in clarifying this principle. These guidelines include:

- Provide options for physical action. It is important to provide materials that all students may use regardless of physical ability. With accommodations for access such as touch screen monitors or speech to text software, options for physical access are provided.

- Provide options for expression and communication. While a student with a reading disability may have difficulty reading aloud, others may find oral expression more suitable. Providing options for expression and communication in lesson design allows all learners to express knowledge and ideas in the classroom.

- Provide options for executive functions. The human capacity to act skillfully is referred to as executive functions. Providing options for executive functions involves efforts to expand executive capacity so that they are more effective and developed (pp. 22-27).

Modern technologies, such as speech to text, touchscreen interfaces, and tape recorders provide resources for educators to utilize in their efforts to create lessons and environments that have a UDL foundation (Brand et al., 2012). There is no one method of expression that meets the learning needs of all students, therefore providing multiple means of action and expression is optimal for all learners.

Multiple Means of Engagement. Offering options in materials and content, when appropriate, giving the learner choices in what stories they read, or choosing methods of

reporting are all ways in which learners are given opportunity to engage at different levels (Rose

& Strangman, 2007). The third of the three brain networks, Affective (Vygotsky & Cole, 1978;

Vygotsky & Kozulin, 1986), is the *why* of learning, and what motivates and encourages learners

to engage in lessons and activities. Multiple Means of Engagement, the third principle of UDL,

encompasses the characteristics of the Affective Network by providing variety and "choice in

content and tools, providing varied levels of challenge and support" to learning (Meyer & Rose,

2005, p. 15). The third column of Figure 2 details the principle and guidelines for the Affective

Network. Student engagement differs from one learner to another, therefore, educators cannot

lean on one method for motivating and engaging students, educators must provide options that

support active engagement (Brand et al., 2012). The guidelines for the third principle, presented

by the National Center on Universal Learning for Design (CAST, 2011b), are follows;

- Provide options for recruiting interest. It is important to have alternative ways to
  interest learners that reflect the individual differences amongst learners.

- Provide options for sustaining effort and persistence. Many learners will develop habits
  and skills that help sustain their efforts in the classroom. Providing options that can
  equalize accessibility by supporting learners who struggle with motivation and self-
  regulation skills create a successful learning environment.

- Provide options for self-regulation. The ability to self-regulate one's emotional
  reactions or state of mind, "in order to be more effective at coping and engaging with
  the environment, is a critical aspect of human development" (p.32). Providing
  appropriate supports to assist students in the development of personal self-regulation
  assist student motivation and persistence in learning (pp.28-34).

Supporting students through the use of digital media and other technologies provides opportunities for learning that may increase learner engagement (Strangman & Hall, 2003). Additionally, text that is represented digitally with the opportunity to interact with the text through varied accommodations such as concept mapping and organizational supports has shown to increase engagement (Pisha & Coyne, 2001). Therefore, providing change in content representation and allowing options for student expression increases the means by which students may engage with their school environment.

The common thread throughout these principles and guidelines is to provide materials in flexible and varied means through representation and to allow alternate designs in assessment with choice and options to engage students in lessons that challenge and motivate learning (Hall, Strangman, & Meyer, 2001). Creating curriculum that is universally designed from the beginning is the goal of UDL (Hall et al., 2012). Curriculum built around UDL principles may be met through publishers creating UDL based curricula for districts to purchase or through the creation of curricula by classroom teachers applying the principles and guidelines independent of publishers (Stahl et al., 2010). Regardless of the means by which teachers acquire UDL designed materials, successful integration of UDL principles must be combined with effective pedagogy to be effective for learners with disabilities.

Technological Pedagogical and Content Knowledge (TPACK)

Introducing new learning theories regarding educational technology into today's classrooms changes more than the tools teachers' use (Harris et al., 2009). Changes to the current practice of teaching are effected by the abilities, beliefs, and intentions of teachers toward technology, pedagogy, and content (Anderson, Groulx, & Maninger, 2011). Therefore, the successful integration of educational technologies is effected by the ability of teachers to

integrate their knowledge of technology, pedagogy, and content into the learning environment.

The principles of successful technology integration are the focus of the Technological

Pedagogical and Content Knowledge (TPACK) framework. Technological Pedagogical and

Content Knowledge has risen to become a "clear and useful framework for understanding

technology integration in learning and teaching" (Baran, Chuang, & Thompson, 2011, p. 370).

Founded in the constructs of Shulman's Pedagogical Content Knowledge (PCK) Koehler and

Mishra (2009) added technology to "describe how teachers' understanding of educational

technologies and PCK interact with one another to produce effective teaching with technology"

(p. 62). This framework focuses on the complex "interaction of a teacher's knowledge of

content (CK), pedagogy (PK), and technology (TK)" to successfully integrate technology in the

classroom (Baran et al., 2011, p. 370).

Using TPACK as a framework for thinking about what teachers need to know for a

successful integration of technology into the curriculum, the TPACK framework promotes seven

components (Baran et al., 2011; Koehler & Mishra, 2009; Shin et al., 2009). The components

are defined as:

1. Technology Knowledge (TK): Knowledge about various technologies, ranging
   from low-tech technologies, to more complex computer hardware and software
   programs.

2. Content Knowledge (CK): Knowledge about specific content subject standards
   and concepts.

3. Pedagogical Knowledge (PK): Knowledge about instructional methods and
   processes of teaching.

4. Pedagogical Content Knowledge (PCK): Pedagogical content knowledge is different in each content area, as it blends both content and pedagogy with the goal of developing better teaching practices.

5. Technological Content Knowledge (TCK): Knowledge of how technology can create new representations for a specific content.

6. Technological Pedagogical Knowledge (TPK): Knowledge of how teaching and learning is changed with the use of various technologies.

7. Technological Pedagogical Content Knowledge (TPACK): Knowledge required by teachers for integrating technology into their teaching in any content area.

Educators who display a good application of TPACK "act with an intuitive understanding of the complex interplay between the three basic components of knowledge (CK, PK, TK)" (Baran et al., 2011, p. 371). The integration of the seven TPACK components is presented in Figure 3.

In this framework, the three interdependent components of teacher knowledge, content (CK), pedagogical (PK), and technological (TK) are framed within contextual knowledge (Harris et al., 2009; Shin et al., 2009). The connection among these three components forms the subsequent interactions of pedagogical content knowledge (PCK), technological pedagogical knowledge (TPK), and technological content knowledge (TCK). The centrally blended interaction of these three components (PCK, TPK, and TCK) forms TPACK, the basis of successful technology integration. According to Koehler and Mishra (2009), successful integration requires insight to the "representation of concepts using technologies; pedagogical techniques that use technologies in constructive ways to teach content; knowledge of what makes concepts difficult or easy to learn and how technology can help redress some of the problems that students face" (p. 66). The key is the integration of all components, "there is no pure
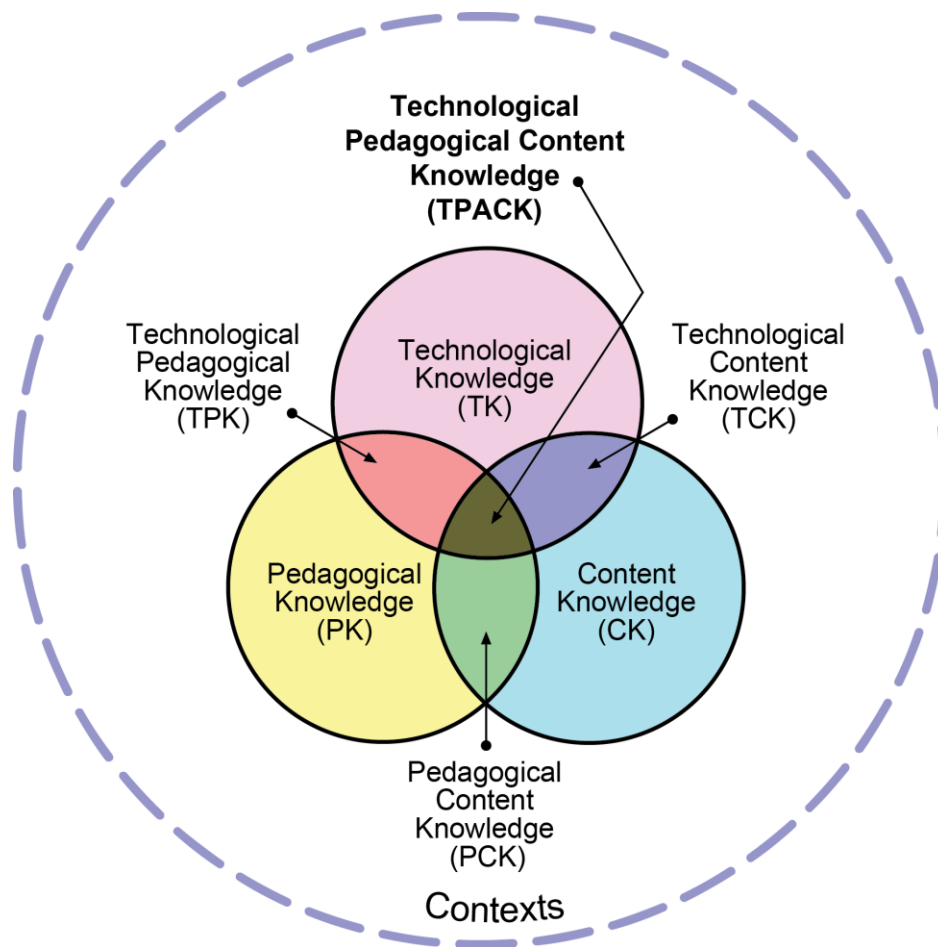
Figure 3. Components of the Technological Pedagogical content Knowledge (TPACK) Framework. Reproduced by permission of the publisher, © 2012 by tpack.org

content, pure pedagogy or pure technology" (Harris et al., 2009, p. 401). Each component has an effect on the other components, and instruction is enhanced when there is a balance. Harris et al. (2009), maintain that the ability of classroom teachers to apply and integrate these components into curriculum planning is the key to successful integration of technology in the classroom. The focus of TPACK in pre-service teacher education programs is to design and develop programs that equip teachers with a more interconnected knowledge of technology, pedagogy, content knowledge (Baran et al., 2011). This interconnected knowledge provides the basis by which teachers can design instruction to meet the learning needs of all students in a variety of areas.

AT & IT that supports all students. Includes word predication software, spell checkers, screen

AT for students with low incidence disabilities. Includes communication

IT that includes text structures

T

C   P
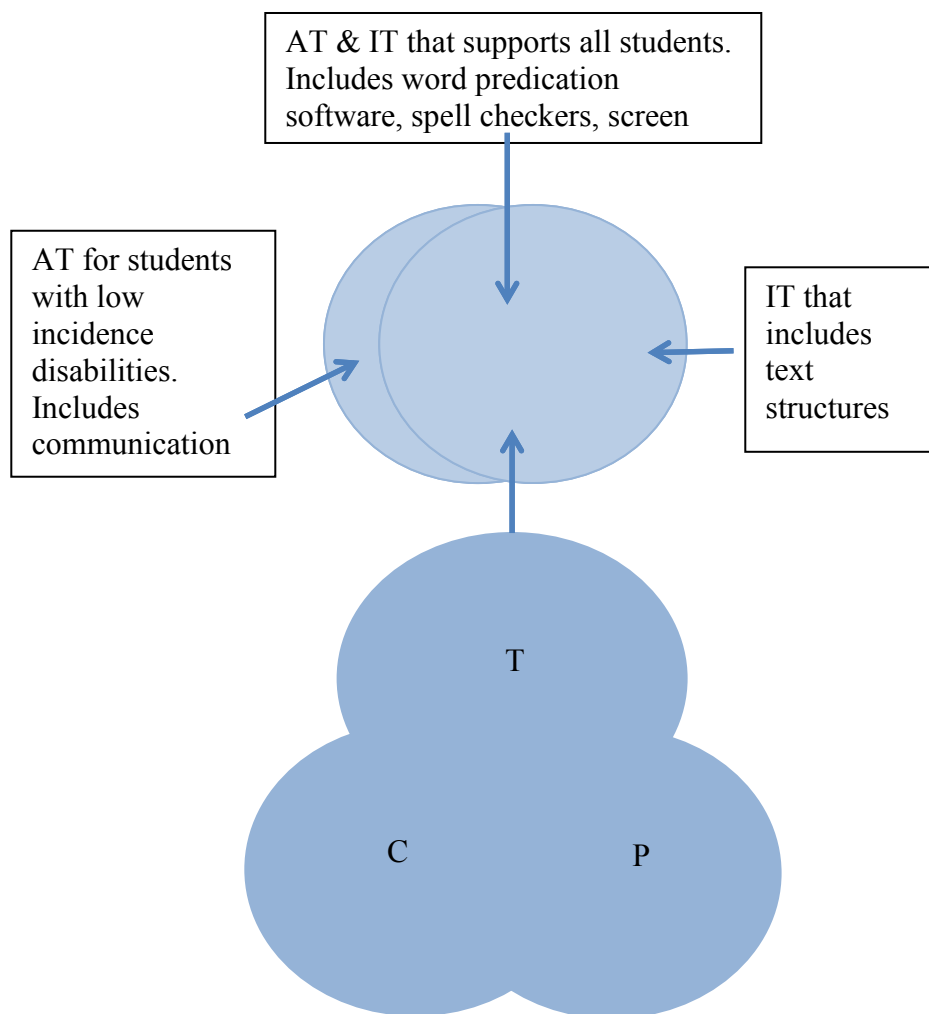
Figure 4.   Enhanced TPACK model with T expanded to include AT and IT. (graphic was adapted from Enhancing TPACK with Assistive Technology: Promoting Inclusive Practices in Preservice Teacher Education, 2009)

Because the typical classroom includes students with disabilities today's educators must have adequate technology knowledge and skills to serve the needs of students with disabilities (Wagner et al., 2006). Providing accessible spaces and materials, while essential for learning, is not sufficient. "Success requires that the components of pedagogy – the techniques, methods, scaffolds, and processes that are embedded in classrooms and curricula – are also accessible" (Rose, Hasselbring, Stahl, & Zabala, 2005, p. 3). An interconnected knowledge of TPACK and UDL provides a foundation for successful integration accommodations to teach all learners.

According to Marino et al. (2009), the increasing number of students with learning disabilities who are served in the inclusive classroom, combined with the characteristics of this population, "create a need to enhance the theoretically sound TPACK framework" (p.188). Adding knowledge of assistive technologies and UDL principles to the TPACK framework promotes access, participation, and learning for students with learning disabilities. Marino et al (2009) added assistive technology (AT) into the TPACK model as seen in Figure 4.

The enhanced TPACK model expands TPACK's technology component to include an overlapping of AT with instructional technology (IT). Special consideration should be given to the partial overlapping of AT with IT in this model. Assistive technology is a sub category within the technological knowledge component which may stand on its own at times or combine with instructional technology in other circumstances. Assistive technology includes specialized services and devices that are essential for student success. Marino et al (2009) contend that adding AT to technical knowledge will encourage pre-service teachers to view technology through a new expanded lens. The inclusion of AT into the TPACK framework holds the potential for pre-service teacher's knowledge of technology to include an understanding of assistive technology and how it can be used to meet the needs of all students. By constructing lessons and curriculum from the outset of the design process to include assistive technologies where needed, we move toward the principles of UDL (Marino et al., 2009). Universal Design for Learning acknowledges that AT will always have a role in the education of students with disabilities. Students with, "physical or language disabilities need properly designed wheelchairs, adaptive switches to control devices, or speech synthesizers" (Hitchcock & Stahl,

2003, p. 48). Teachers' technological knowledge of AT assists the design and integration of specific technologies or devices into the curriculum.

The role of AT as seen in TPACK is characteristically different than the role AT plays in UDL (Rose et al., 2005). Assistive Technology is included in TPACK as an additional technology or device to be utilized based on the content, pedagogy and context in which the instruction takes place (Marino et al., 2009). Assistive technology is a technology or device that is specific to the individual student and provides access to a curriculum that is inaccessible by providing accommodations such as digital text, large print, and screen readers for student use (Strangman & Hall, 2003). In essence, AT, in this format, is the retrofitting of instructional materials and technology to meet the needs of students with disabilities. The function of tasks performed by an individual student is evaluated for AT that "increase, improves, or maintains the functional capabilities of students with disabilities" (Rose et al., 2005, p. 508). Based upon evaluation results, AT is provided exclusively for the student's use in the classroom as an addition to the curriculum focusing on the individual student's function within the curriculum (Zabala, Bowser, & Korsten, 2005). Universal Design for Learning focuses on the curriculum and the use of technology to provide access for all learners (Rose & Meyer, 2002). Assistive technology and UDL rely on current technology to provide access to the curriculum. However, as AT is added to technological knowledge in the TPACK model, AT functions as the tool by which educators' retrofit the curriculum for a specific student as opposed to creating accessible materials available to all students.

With the widespread integration of technologies once thought to be AT, such as voice to text, word prediction, etc., the look of AT will change. However, the need for and role of AT will stay the same, increasing the functional performance of specific students based on evaluated

need (Zabala et al., 2005). Successful integration of technology that meets the needs of students, outlined in the principles of UDL, must include the technological pedagogical content knowledge laid out in the TPACK components. The integration of UDL principles within the components of TPACK provides a model for curriculum design that addresses technology, pedagogy, and content while providing multiple means of representation, expression and engagement.

<div align="center">**Empirical Studies in the Use of Digital Text**</div>

The research regarding the use of digital text, technology integration, and teacher beliefs (Anderson-Inman & Horney, 2007; Chen, 2008; McCray & McHatton, 2011) reveals the shifts in instructional materials from print based to digital formats, the pedagogical significance of multi-representation of digital text, and the beliefs and perception of teachers in technology integration and the use of accommodations. In its simplest form, digital text, as described by Strangman and Hall (2003), is text consisting of an computerized display of print material absent of other media such as sound and images. In this format, digital text is presentation of original text in a digital manner such word processors or a web page with no added modifications to the text. In contrast, Hall et al. (2012) describe digital text as digital media that offer a range of embedded supports and scaffolds. This includes a broader definition to include text modifications such as sound and images, "text to speech capabilities, links to background information, and glossaries" (p.12). Advancements in technology and multimedia, as noted by Honan (2012), have influenced the use of digital text in the inclusive classroom. However, Chen (2008) suggests teacher abilities and beliefs toward technology is a critical factor in successful integration of technology. In the following sections, three aspects of the use of digital text, namely shifts in instructional

materials, the pedagogy of digital text, and teacher abilities, beliefs, and intentions are discussed to identify current trends and the need for further research.

Shifts in Instructional Materials

With increasing access to the general curriculum, students' with disabilities participation in the general education classroom have heightened the awareness and necessity to address the learning needs of each child. To address these needs, many educators have turned to technology, specifically computers, to provide alternate means of gaining information through digital text (Stetter & Hughes, 2010). Educators and educational researchers in special education (Larsen, 1995; Torgensen, 1986) have envisaged a positive impact on learning by using technology for students with disabilities. To address the effectiveness of digital text verses printed text, several studies were conducted to examine the difference in reading comprehension, attention span, and the application of reading strategies when text is presented on a computer as compared with printed text.

Casteel (1989) studied 30 students with learning disabilities to assess the effects of using printed text or text presented on computer screens to determine which method would significantly improve reading levels. Text was presented as traditional text passages and passages using the chunk reading strategy, "grouping words or recoding of information into fewer, more manageable units" (Casteel, 1989, p.115). Students were divided into three groups, one using traditional text, one using chunk text in the printed format and one group using chunk text presented on a computer screen. Casteel (1989) found that the differences in reading comprehension between the two groups using chunked passages were not significantly different. Casteel's research revealed that the presentation of chunked text on a computer screen did not produce significant gains in reading comprehension over chunked passages presented using

traditional printed text. However, using chunked reading passages did produced significant gains in reading comprehension when compared to traditional printed passages for students with learning disabilities.

In another study, Keene and Davey (1987) sought to determine if computer-displayed text significantly affected reading comprehension, the use of reading strategies, task completion time, and student attitude toward the reading task as opposed to traditional print-based materials. This study consisted of 51 high school students with learning disabilities divided into two groups. One group received microcomputer text and one group received traditional printed text. Reading passages of 600-700 words were prepared for both the microcomputer text and paper text presentation. Findings of Keene and Davey (1987) showed no significant difference in reading comprehension between presentation groups. Therefore, the presentation of reading passages on a computer or in printed text did not significantly affect reading comprehension. Similarly results showed no significant effect of presentation group on task completion time. Therefore, according to Keene and Davey (1987), computer presentation did not significantly improve task completion on the subjects tested. However, results in the use of reading strategies showed the computer group having a higher frequency of re-inspecting passages than the printed text group. Attitude ratings for the computer group exceeded the rating of the printed text group. Keene and Davey (1987) suggest that while reading comprehension and task completion time did not increase with the use of text presented on computers, the use of reading strategies and attitudes toward the task did improved with the use of computer presented text.

Advancements in technology have provided software programs that convert digital text to speech. Text to speech technology uses synthesized or digitized speech to read out loud the digital text. Computer reading programs using text to speech are "similar to traditional

classroom reading methods such as guided reading in that they include auditory components with a visual representation of text" (Sorrell, Bell, & McCallum, 2007, p. 2). Studies have reported that text to speech computer reading programs may support reading skill gains in phonological decoding by providing instant and/or continuous feedback and practice (Olson, Foltz, & Wise, 1986; Wise, Ring, & Olson, 2000). Auditory feedback and computer presentation of challenging words led to improvements in phonological and decoding skills. In another study, (Sorrell et al., 2007) focused on student comprehension while reading on the computer using a text to speech reading program as compared to traditional reading programs. In addition to reading comprehension, Sorrell et al. (2007) studied "extent to which rate and comprehension are influenced by varying computerized oral reading rate" (p.4). Participants were 12 students ranging from second to fifth grade identified as reading below grade level, four of which were identified as learning disabled. Students were randomly assigned to either a computer reading or traditional reading group. Pre-test data gathered reading levels from Accelerated Reader (AR), word recognition from the Qualitative Reading Inventory III (QRI3), and baseline reading rates on passages from the QRI3. Students grouped as pairs read passages approximately 45 minutes per day for four to five days per week for four weeks. Results showed similar reading rates and reading comprehension across both reading programs. Consistent with findings from previous studies, this study showed no significance between reading comprehension and reading rate for students that used digital text as opposed to those who did not.

Deeply rooted in the promise that technology holds for students with disabilities, researchers continue to examine to the effects of digital text with text to speech support. In a review of literature concerning text transformations, Strangman and Hall (2003) identified thirteen studies concerning the effectiveness of text-to-speech or recorded speech as a learning

tool. Eight studies reviewed used synthesized speech as a learning tool. Positive effects of

synthesized speech were discovered in six out of the eight studies. Improvement in word

recognition (Wise et al., 2000) following time spent using text-to-speech as well as improved

sentence-level editing (Borgh & Dickson, 1992) was reported. In a study by Elbro, Rasmussen,

and Spelling (1996) "word recognition, comprehension, and fluency were all more positively

affected by the use of synthesized, syllable or letter name – level synthetic speech than ordinary

remedial training" (p.5). Other learning outcomes using text-to-speech technologies (Elbro et al.,

1996) such as word decoding, phonics, and phonemic awareness were evaluated as not

significantly different from traditional methods. Strangman and Hall (2003) conclude that there

is little corroboration within the research on synthesized text-to-speech which makes it difficult

to draw a conclusion as to the effectiveness of synthesized text-to-speech as an accommodation

for students with learning disabilities. Additional research is needed on synthesized text-to-

speech on word recognition and reading comprehension.

Strangman and Hall (2003) continued the literature review of text-to-speech by locating

research investigations of digital text-to-speech and recorded speech. While few studies were

identified, all were "generally favorable" (Strangman & Hall, 2003, p. 6). One such study

conducted by Davidson, Coles, Noyes and Terrell (1991) found that reading text with recorded

voice or digitized text-to-speech supports effectively improved vocabulary, word reading

accuracy, and fluency as well as improvements on standardized reading assessments. Other

studies, (Dawson, Venn, & Gunter, 2000; Montali & Lewandowski, 1996; Shany & Biemiller,

1995) also found improvements in reading vocabulary, word accuracy, and fluency in addition to

word recognition scores when just listening to pre-recorded text. While the research is limited,

there is evidence to support that digitalized text-to-speech or recorded speech can improve reading skills.

The results of empirical studies focusing on the effectiveness of digital text as opposed to printed text are not surprising (Strangman & Hall, 2003). It is understandable that simply displaying text on a computer screen will not bring about improved reading skills. However, literature reviews of studies on text-to-speech supports to digital text have shown conflicting results. While synthesized text-to-speech has mixed reviews leaving effectiveness unclear, digitalized text-to-speech does have favorable results and is deserving of further research.

Pedagogy of Digital Text

Educators view technology as an effective tool to assist in reading comprehension and content knowledge for students with learning disabilities (Craver & Burton-Radzely, 1998). However, access to digital text alone has not shown significant improvement in reading comprehension. Therefore, researchers have turned their attention to the use of digital text supported with hypertext and other instructional strategies (Stetter & Hughes, 2010). Hypertext focuses on delivering supports by providing links to additional information, embedding video, or audio clips that utilize strategies for understanding text (Wissick & Gardner, 2000). Several studies have been conducted to assess the benefits of hypertext, and other specific learning supports embedded in digital text, on reading skills and comprehension for students with learning disabilities.

Leong (1995) examined the effectiveness of online reading plus *DECtalk* auding in helping students improve reading comprehension and summarization of text. DECtalk is a text-to-speech system that has embedded supports in the area of vocabulary definitions and substitutions. The study consisted of a preliminary study (study 1) and a replication study (study

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2) as described by the researchers. Study 1 consisted of 192 students, ranging from grade four through six, considered to be above average and below average in reading comprehension. Students were randomly assigned to four intervention groups. Intervention groups included the following experimental conditions:

1)   Online reading and DECtalk auding of unsimplified passages with no explanation of difficult words (Condition OD);

2)   Online reading and DECtalk auding of unsimplified passages plus explanation of difficult words in both modes (Condition ODE);

3)   Online reading and DECtalk auding of unsimplified passages plus explanation of difficult words in both modes plus individualized children's short verbal answers to on-line and DECtalk-generated reading awareness questions pertaining to each passage prior to reading and auding (Condition ODEM); and

4)   Online reading and DECtalk auding of simplified passages with no explanation of difficult words (Condition S). (Leong, 1995, p. 106)

Students were assessed in the areas of vocabulary, general ability, word reading, metacognition, and working memory span prior to the study and after intervention. Each group was presented with a number of different expository reading passages. The intervention groups had varying levels of support such as, simplified or non-simplified text and/or explanation or no explanation of difficult words. After each passage participants were asked to a) verbally answer inferencing questions, and b) verbally summarize each passage in their own words. Findings from Study 1 revealed no significant differences in reading comprehension, vocabulary, general ability, word reading, metacognition, and working memory between the four interventions. However, students did improve on inference questions when using DECtalk, although not

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significantly. Study 2 corroborated the findings of Study 1 in that there was no significant difference between intervention groups in the areas of reading comprehension, vocabulary, general ability, word reading, metacognition, and working memory. In considering the findings of this study, Leong (1995) suggests researchers conduct a careful appraisal of the "pros and cons of computer mediated reading…specifying the kinds of students, reading materials, reading processes and other variables that are most amenable to this technology"(p. 112). While text-to-speech software with vocabulary support was not found to be successful in improving the reading comprehension of expository passages, other reading skills, such as phonological knowledge, may be significantly improved. Continued research in the areas of specific populations and targeted skill sets is suggested.

Research within the last decade has focused upon the use of technology in core content areas such as science and social studies (Ferretti, MacArthur, & Okolo, 2002; Twyman & Tindal, 2006). While UDL does promote the use of technologies in all subject areas, the primary focus of research on digital text has been on reading instruction and comprehension (Hitchcock & Stahl, 2003). Twyman and Tindal (2006) promote the flexible presentation of information through technology which can enable students with learning disabilities to access science and social studies content information. This access allows students with disabilities to minimize learning deficits while maximizing strengths in these content areas.

Hypermedia and multimedia using "cooperative text systems" (Boone, Higgins, Falba, & Langley, 1993, p. 29) provide readers with additional related information in a flexible digital format. Hypermedia has also been the focus of many research studies including a study of enhanced supports such as study guides and text simplifications conducted by K. Higgins, R. Boone, and T. Lovitt (1996). The purpose of this study was to "determine the effects of

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hypermedia text presentation on the comprehension of content area reading material of students with learning disabilities and remedial students" (Higgins, Boone, & Lovitt, 1996, p. 403). Twenty-five ninth grade students in an inclusive social studies class were randomly assigned to one of three educational methods; a) lecture, b) lecture/hypermedia study guide, and c) hypermedia study guide. The hypermedia study guide consisted of computerized information free of screen scrolling requirements, the use of titled pages, functional organization of text, and clear, un-crowded screens. Teacher suggestions on vocabulary, concepts, charts, and graphics were incorporated into the design of the enhanced study guide. Each method involved 30 minutes of instruction followed by a 10 minute multiple choice quizzes during a 10-day period. Results from the study indicated that there was a significant difference in educational methods found in the retention tests. However, due to a small sample size it is unclear what caused the difference. The group that participated in the lecture/hypermedia guide instructional model maintained the highest mean retention scores whereas, the group that participated in lecture only maintained the lowest mean retention scores. Similarly, results from daily quiz scores followed the same pattern. Students participating in the lecture/hypermedia guide instructional model had higher quiz scores followed closely by the hypermedia instructional group. Students participating in the lecture only instructional model scored the lowest quiz results. Conclusions from this study suggest that the retention of factual and inferential information was increased by the blending of teacher instruction followed by a hypermedia study guide. K. Higgins, R. Boone, and T. C. Lovitt (1996) cautioned, that too often, educational technology is developed without taking into consideration the instructional strategies that have been found successful with students with disabilities.

Achieving historical understanding requires that students receive relevant content knowledge with minimal cognitive effort while applying appropriate instructional strategies (Alexander & Murphy, 1998; Bransford, Brown, & Cocking, 1999). Using a blend of instructional technology with instructional methods embedded in a conceptually framed, computer-adapted history textbook Twyman and Tindal (2006) examine its effects on the comprehension and problem solving skills of students with disabilities. This study focused on 24 students in 11th and 12th grades with learning disabilities in reading. Students were randomly assigned to an experimental group or control group. The groups were measured on vocabulary matching, concept maze tasks, and content knowledge. The experimental group received instruction in U.S. history using a conceptually organized, computer-adapted text. The computer text consisted of an opening page where students could choose from a) an overview of the chapter, b) a list of concepts, c) simplified text, or d) problem solving assessments. The text design followed UDL principles by allowing students to choose the use of text-to-speech, or vocabulary supports such as glossaries and pronunciations. The control group was instructed using the district adopted textbook sections on the industrial revolution. Findings of the study showed no statistically significant differences in group results for vocabulary matching, and problem solving. However, the effect size calculated for each measure did show medium to large effects sizes. Thus, instruction delivered through a conceptually framed, computer adapted history text was effective in improving vocabulary matching, and problem solving skills in students with learning disabilities. Challenges within the master schedule of the campus and low sample size support the need for additional research to replicate this study with larger sample sizes. While the study did not produce statistically significant results, the effect size calculated

for each measure supported the use of a conceptually organized, computer adapted text for students with learning disabilities.

Computer adapted text books offer supports such as text-to-speech and vocabulary and glossary supports (Strangman & Hall, 2003). However these supports may not be enough for many students. Additional considerations of AT such as e-readers, screen magnification devices and adapted computer devices are great supports for students with disabilities (Alliance for Technology Access, 2004). Effective as these methods may be, they are of little use for students lacking lexical knowledge (Rose & Meyer, 2002). Instructional supports designed solely for access are not effective interventions for students with severe learning disabilities. Extra cognitive support is needed and may include presenting important concepts with visuals, audio and video, and the use of concept maps (Ko, Chiang, Lin, & Chen, 2011). According to Cook and Polger (2008), reading is not just a cognitive process but also a process of motor control and visual perception. Learners may need to overcome physical, sensory, and cognitive barriers to participate in reading instruction. Physical, sensory, and cognitive access should be considered when designing reading interventions (Ko et al., 2011). However, existing assistive technology reading software is only able to offer separate supports such as text-to-speech and vocabulary definitions (Chu, Li, & Chen, 2002; LoPresi, Mihailidis, & Kirsch, 2004). Seeking to fill the need for a reading intervention that addresses the barriers of physical, sensory, and cognitive access, Ko, Chiang, Lin and Chen, (2011) developed an integrated reading support system based upon the UDL principle of multiple representation. An integrated reading system is a web based e-reading system which provides individualized physical, sensory, and cognitive access for students with special needs. Providing assistance beyond typical text-to-speech, vocabulary, and glossary supports.

In order to seek the effectiveness of an integrated reading support system for students with learning disabilities, Ko et al. (2011) selected 30 students to participate in a study to determine if there was a difference between reading comprehension and reading sequence when an integrated reading support was implemented. Students were randomly assigned to two groups, each group reading six articles each with cognitive supports and without cognitive supports. When reading text with cognitive supports, students were encouraged to use the supports they liked and were told they could use them as many times as they wanted. When reading text without the cognitive supports, students were asked to read the article aloud. Comprehension assessments, supported by text-to-speech, were given after each text was read. Results of the study found that main effect of the reading condition was statistically significant. The mean of the two reading conditions demonstrated that students' performance improved when reading with cognitive supports. However, while the study observed the use of various cognitive supports it did not focus upon the effects of specific supports on specific individuals. The students were highly motivated to use the integrated reading support system; however, the reasons for the increase in motivation were not studied. Determining the benefits of specific cognitive supports use with various disabilities as well as the reasons behind student motivation in choosing to use these supports is an area for further research. It is beneficial for teachers to be aware of the resources and instructional strategies that have been proven effective with specific disabilities in order to improve instructional plans.

Research regarding the use of digital text supported with instructional strategies suggests that it is unlikely that digital text alone will have much impact on improving the reading comprehension or motivation of students with disabilities (Twyman & Tindal, 2006). Students need direct instruction in content specific knowledge teamed with strategies on how to

implement new technologies, such as hypertext and multimedia supports, to improve knowledge

acquisition and comprehension (Boone et al., 1993; Stetter & Hughes, 2010). Perhaps, as

Shapiro and Neiderhauser (2004) conclude,

> Turning students loose on a hypertext will not guarantee robust learning...In the right
>
> circumstances, though, hypertext can enhance learning. It does so by presenting
>
> environments that offer greater opportunities for students to engage in the type of
>
> cognitive activities recognized by theorists as encouraging learning: active,
>
> metacognitive processing aimed at integrating knowledge and boosting understanding.
>
> (p.618)

For digital text represented in the form of hypertext to be successful, the pedagogy of proven

instructional methods needs to be included. Technology can be a vital asset to student learning;

however, technology implementation that lacks proven pedagogical foundation is ineffective at

increasing student reading comprehension and motivation (K. Higgins et al., 1996; Ko et al.,

2011; Twyman & Tindal, 2006). Consideration of the technological and content abilities as well

as the beliefs and personal intentions of educators provide the foundation for the successful

implementation of instructional and assistive technologies.

Abilities, Beliefs, and Intentions

Researchers have suggested that an essential factor for successful technology integration

into the classroom is the teacher (Bitner & Bitner, 2002; Loveless, DeVoogd, & Bohlin, 2001;

Ramono, 2003). Instruction that goes on behind classroom doors and walls is the responsibility

of the teacher and therefore a vital factor in the study of digital text. Researchers (Cuban,

Kirkpatrick, & Peck, 2001; Semple, 2000) have noted that teachers typically use authoritative,

teacher-centered methods of instruction as opposed to learner-centered instruction. Factors

influencing these decisions have been attributed to teachers' educational beliefs and personal theories concerning teaching and learning (Albion & Ertmer, 2002; Lim & Khine, 2006; Scrimshaw, 2004). Beliefs are filters that guide a teacher's decision making process and affect how a teacher implements technologies and uses new teaching methods (Pajares, 1992). However, some studies suggest that the challenges of the classroom often limit teachers' ability to implement technology congruent with their beliefs (Edyburn, 2010; Pajares, 1992). Several studies (Anderson et al., 2011; Berry, 2006; Levin & Wadmany, 2006) have focused on the abilities, beliefs and intentions of teachers in the area of instructional technology implementation in the classroom.

Exploring the evolution of teachers' beliefs on learning and technology, (Levin & Wadmany, 2006) studied "whether, how, and why teachers use of information-rich tasks in an information-rich classroom environment influences their views on learning, teaching, and their actual practices" (p. 157). The three-year study focused on teachers' explicit statements and observations of classroom practices. Participants included six classroom teachers as well as 164 of their students in an elementary campus. Four teachers participated in the study for all three years and two teachers participated for two years. Data were gathered using interviews, observations, and questionnaires. Questionnaires and interviews focused on educational beliefs and knowledge. Observations and weekly meetings were held to study practices in teaching. Findings of the study showed that during the three year period changes occurred in the beliefs and educational practices of all six teachers. Specifically, at the beginning of the study most teachers held behaviorist and transmissionist views on learning and teaching respectively. After the three-year period, teachers viewpoints had shifted from positivist and behaviorist viewpoint to views focused more on student understanding than on covering content. Discussion and

implication of this study support that belief systems are dynamic, changing and restructuring when individuals are open to evaluating their own beliefs. This study also demonstrated that educational change involving educational technology is an individual process. Each individual teacher will experience change in a unique way. There can be no one way to practice the implementation of technology. Instead, unique characteristics and diverse knowledge levels should be taken into account when designing technology implementation plans.

Similar studies examined the relationship among pre-service teachers' technology related abilities, beliefs, motivations, and intentions related to their plans to integrate technology into their future teaching (Albion & Ertmer, 2002; Anderson et al., 2011; Etmer, 2005; Niederhauser & Perkman, 2008). Anderson, Groulx and Maninger (2011) examined 217 pre-service teachers enrolled in a semester-long technology course. Pre-service teachers were from both undergraduate and graduate programs. A survey administered the last week of the semester addressed the categories of abilities, self-efficacy, value beliefs, constructivist beliefs, intentions variety, and intentions frequency. Results in relationships among variables showed a statistically significant correlation between value beliefs, constructivist beliefs, and self-efficacy. The highest correlation was between self-efficacy and constructivist beliefs. Self-efficacy beliefs were also moderately correlated with value beliefs and abilities. Values beliefs were also moderately correlated with intentions to use a variety of technology and the intent to use technology frequently in the future. Prediction of intentions regarding frequency and variety of computer software was analyzed using two backwards multiple regression tests. Predictor variables were abilities, self-efficacy, values beliefs, and constructivist beliefs. The first analysis results showed that the intention to use a variety of software was statistically significant. Values beliefs and self-efficacy accounted for 35% of the variance in intention. A regression coefficient

indicated that values beliefs explained most of the variance with self-efficacy accounting for a smaller portion. The second analysis for intentions regarding the frequency of classroom technology was also found to be statistically significant. Values beliefs and ability accounted for 26% of the variance in intentions regarding the frequency of technology use. Values beliefs explain most of the variance with self-efficacy accounting for a smaller portion of the variance. The findings from this study emphasize the strength of values beliefs in predicting pre-service teachers' intentions to use a variety of technology frequently in their future classrooms. With this information it would be helpful for teacher educators to consider ways of influencing students' value beliefs, self-efficacy beliefs, and abilities since these constructs help predict the intention to integrate technology in the classroom in the future.

Another study involving pre-service teachers focused on gaining an understanding of the beliefs and motivations that impact teachers' decisions to include technology in their future teaching experiences (Cullen & Greene, 2011). In this study, 114 pre-service teachers enrolled in a required undergraduate university course were studied over the course of two semesters. The participants completed an online questionnaire consisting of 50 six-point Likert scale items measuring perceived behavior control, attitudes toward technology use, perceived social norms, intrinsic and extrinsic motivation, and amotivation. At the beginning of the class, the pre-service teachers were given the opportunity to respond to the writing prompt, "Using a topic from your content area specialty or desired grade level, describe an ideal lesson that used technology" (p. 35). Participants completed this activity again at the end of the course and were asked to write a one page reflection paper comparing the two responses. All participants completed the questionnaire and 67 completed a pre/post activity reflective task. Results from the questionnaire indicated that overall attitude toward technology use was a significant predictor of

both intrinsic and extrinsic motivation to implement technology. Positive and negative attitudes were best for understanding intrinsic motivation while positive attitudes only were useful in predicting negative motivation. Cullen and Greene (2011) suggest that implications of their study show that knowing a group has a positive attitude toward technology use may indicate that the group would be agreeable to additional technology training or classes. However, they caution that these positive attitudes do not ensure that pre-service teachers will integrate technology in their classrooms. Rather positive attitudes suggest that pre-service teachers are ready to consider new paradigms of classroom technology integration.

Teachers' internalize specific beliefs and theories about education that influence their teaching practice (Pajares, 1992). These beliefs have an impact on the likelihood of teachers' integration of technology into the classroom (Anderson et al., 2011; Cullen & Greene, 2011). This is no less true for teachers of students with disabilities in inclusive classrooms (Berry, 2006). As more students with disabilities receive instruction in an inclusive setting, general education teachers experience increased expectations to provide effective instruction for this population (Berry, 2010; Hitchcock, Meyer, & Rose, 2002; Pugach, 2005). Investigating the attitudes, beliefs, and perceptions of educators will allow a deeper understanding of how these factors influence teachers' instructional practices for students with disabilities.

Examining the attitudes of beginning general education teachers, Berry (2010) sought to specify the relationship between confidence/anxiety, positive/negative attitude and areas of inclusion. At the conclusion of a graduate level special education course, 60 beginning general education teachers participated in a structured activity of sorting and categorizing 24 statements. The statements addressed the relationships between confidence/anxiety and positive/negative attitudes, and three areas of inclusion: instructional accommodations, fairness, and general

perceptions. Data analysis identified three teacher profiles a) keen, but anxious, beginners, b) positive doers, and c) resisters. Keen, but anxious, beginners group included mostly young and inexperienced pre-service teachers. Two distinguishing statements for this group are:

- I have never tried to teach a student with a disability, so I'm a little nervous, but I am in favor of having students with disabilities in the general education classroom.

- I think inclusion is a great thing, but I don't know if I myself will always know the perfect adjustment to make. (Berry, 2010, p. 87)

These results corroborate the findings of other studies suggesting that pre-service teachers, although less antagonistic of inclusion, are somewhat anxious and worried about their lack of knowledge and experience (Carroll, Forlin, & Jobling, 2003; Taylor & Sobel, 2001).

Positive Doers while mostly young and inexperienced like the Keen, but anxious, beginners group has a higher participation from older experienced teachers. Only one distinguishable statement stood out for this group.

- Something I have observed is that many of the things I need to do to accommodate students with special needs are things I already do. (Berry, 2010, p. 87)

This statement shows the fundamental difference between these two groups, confidence replaces anxiety. These teachers seem committed to the theory of inclusion and confidently believe they have the tools necessary to be effective.

 The resistors group represented by mostly in-service middle school and high school teachers was distinguished from the other two groups by 17 statements. Samples of the distinguishable statements were:

- I firmly believe that the idea of inclusion of special education students might hinder the learning of non-special education students.

- I believe having students with disabilities in my class would affect my attention span to the other children, which would not be fair.

- It's hard to decide about inclusion; I keep coming back to fairness and what about the other children?

- I want to treat everyone fairly, but how do I judge what is fair? How can I give a student an A for IEP work when it's below grade level? (Berry, 2010, p. 88)

This group maintains the belief that students without disabilities will suffer from a lack of attention while enrolled in an inclusive class. This group resists mandates such as accommodations and modification of curricular expectations. The profile *keen, but anxious, beginners* was the dominant factor for 43 participants of which 84% were pre-service teachers and 16% were early career teachers. This group of teachers held positive attitudes and displayed confidence toward inclusion, fairness, and accommodations. Issues of fairness in regard to providing accommodations were not a high factor for this group. The profile *positive doers* was the dominate factor for 10 participants of which 60% were pre-service teachers and 40% were early career. Like the first group, this group held positive attitudes toward inclusion and high levels of confidence toward inclusion, fairness, and accommodations. The profile *resisters* was the dominant factor for five participants of which 80% were early career teachers and 20% was pre-service teachers. This group of teachers held a negative attitude toward inclusion, fairness, and accommodations with the highest concern toward fairness.

Guided by Pajares (1992) work on teacher beliefs, and seeking to understand the perceptions of elementary and secondary education majors toward inclusive education, McCray and McHatton (2011) conducted a study of pre-service teachers prior to and after taking a course on integrating exceptional learners. This study was conducted at a large, urban university in the

southeast United States. Participants were education majors enrolled in a course designed for general education majors to gain an understanding of the roles and responsibilities for including students with disabilities. Participants were given a survey, consisting of 22 Likert style items, prior to instruction in the course and at the end of the course. Following the survey given at the end of the course, participants were asked to complete an additional questionnaire of five open- ended questions. Findings from the data analysis of the surveys determined that there was no statistical significance in perceptions between elementary and secondary education majors. Results also indicated positive perceptions increased from the first administration to the second administration of the survey. Of specific interest was the finding that, although participants held positive attitudes toward the inclusion of students with disabilities, 30.4% either did not agree or were undecided when asked if they believed most students with disabilities could be educated in the general education classroom. Participants strongly believed that students with learning disabilities, hearing impairments, and health impairments could be educated in the general education setting. However, educating students with more significant intellectual and multiple disabilities in the general education setting showed the highest area of disagreement in regard to their inclusion in the general education classroom.

With the knowledge gained from analysis of the survey data, (McCray & McHatton, 2011) turned their attention to the open-ended questionnaire. The questionnaire was analyzed using an open coding and axial coding process. After the analysis was completed, codes were categorized as being either *Affective* or *Knowledge/Skills*. The Affective category included responses coded such as beliefs, self-efficacy, teacher limitations, equality, and emotions. The category of Knowledge/Skills included codes such as instructional approaches, disability characteristics, legal issues, accommodations, modifications, co-teaching, and assistive

technology. Responses to the open-ended questions suggested that pre-service teachers were more aware of the affective aspects of inclusion. Participants were also interested in gaining information on instructional approaches and specific characteristics of disabilities. Of interest is that secondary education majors reported their greatest strengths were knowledge and skills related and were more likely to express affective changes as a result of the course. Secondary education majors also expressed the desire to increase their knowledge and skill related to students with disabilities. A higher number of elementary education majors responded to the open-ended questions and provided responses indicating the need for support in knowledge and skills. Through the progression of the course, participants did show an increase in their understanding and positive attitudes toward the instruction of students with disabilities in the general education setting. Regardless if the participant held a positive attitude toward their abilities in the area of knowledge and skills, both elementary and secondary education majors desired more resources and information regarding students with disabilities.

Successful teaching and learning in the inclusive classroom is largely grounded in the teacher's knowledge, skills, and attitudes, all of which can be destabilized by a belief system that is inconsistent with an inclusive paradigm (McCray & McHatton, 2011). As Hitchcock and Stahl (2003) expound, effective teaching does not result from one particular method or approach but from a teacher's complex knowledge and concern that focuses attention on the academic, behavioral, and emotional needs of individual students. Inclusive classrooms have the potential to be successful when teachers accept inclusion as a necessary and beneficial aspect of education. Irrespective of attitude or level of experience, teachers require and want information about specific disability characteristics taking into account the nature of learner differences, capabilities of new media, and the most effective teaching practices to address the diverse needs

of today's students and related instructional techniques (McLesky & Waldron, 2002; Rose et al., 2005).

Using empirical studies, I demonstrated that there has been a shift from traditional printed text to digital text presented on computer screens in terms of including digital text as instructional practice. Not surprisingly, studies demonstrated that changing the presentation of text from traditional print to an digital format did not significantly affect the reading comprehension of students with learning disabilities (Strangman & Hall, 2003). Next, I reviewed the use of hypertext in instructional practices. Studies support the blending of hypertext with instructional strategies and accommodations for increased reading comprehension and motivation for students with disabilities (K. Higgins et al., 1996; Ko et al., 2011). Finally, exploring teachers' abilities, beliefs, and intentions toward technology use in the classroom demonstrated that it is helpful to examine technology integration beyond a school or professional development issue. Further, technology integration could be viewed as a process, driven by the personal beliefs, intentions, and perceived abilities of the classroom teacher toward teaching and using technology. Such an assertion was also supported with studies of teachers' beliefs and attitudes toward the instruction of students with disabilities in the general classroom (McCray & McHatton, 2011). Studies show that positive attitudes of pre-service teachers toward the inclusion of students with disabilities support the belief that students with disabilities should be educated in the general education setting (Berry, 2006, 2010). To maintain this positive attitude, the researchers asserted the need and desire for more knowledge and skills regarding students with disabilities (McCray & McHatton, 2011; McLesky & Waldron, 2002).

Each of these studies has shown implications and limitations in the use of digital text for students with disabilities. Studies on the use of digital text did not take into consideration the

beliefs, attitudes, and intention of the teachers implementing the technology, nor were many of the studies conducted over a prolonged period of time. Studies on the integration of technology examined the beliefs, attitudes, and intentions of pre-service teachers toward the use of technologies; however, the examination of the use of these technologies with students with disabilities was not examined. In the existing research, the beliefs and attitudes of pre-service teachers toward the inclusion of students with disabilities and the use of technology as accommodation for students was not examined. However, extensive studies present evidence to suggest that pre-service teachers' desire the knowledge and skills needed to be successful in their instructional practices.

Summary

This chapter began with a discussion of the historical perspective of accessible instructional materials and the legal issues therein. Then I described in detail the theoretical framework grounding this study. I described Universal Design for Learning, an educational framework that provides flexibility in the ways information is presented, in the ways students respond or demonstrate knowledge and skills, and in the ways students are engaged (Rose et al., 2005). Next, I described Technological Pedagogical and Content Knowledge to understand how content knowledge, pedagogical knowledge and technological knowledge work together to prepare pre-service teachers for the future technological integration in the classroom.

Supporting successful teaching and learning in the inclusive classroom is contingent on the teachers' knowledge and skill in student disabilities, content, pedagogy, and technology, as well as a positive belief in inclusive education (McCray & McHatton, 2011; McLesky & Waldron, 2002). Looking forward, research is needed in the use of specific technologies that

target the characteristics and needs of students with disabilities, taking into account the

experiences of in-service teachers.

CHAPTER 3: METHODOLOGY

Recall the purpose of this research was to identify how two teachers in inclusive classrooms located in South Texas describe their experiences using digital text for students with learning disabilities.

Two research questions guided this study:

1. What are the experiences of participants in using digital text in the inclusive classroom?

2. In what ways do the participants describe the various digital text resources they use in the inclusive classroom?

Methodology

This research focused on how two K-12 school teachers describe their experiences and personal beliefs regarding the use of accessible instructional materials, in the form of digital text, in an inclusive classroom. The primary focus of this study was to understand how teachers interact and make meaning of the process of implementing AIM within their individual situations. Case study is a leading research method that allows the researcher to gather multiple sources of data, through extended time in order to gain new understandings of our world (Merriam, 1998; Yin, 2009). Through the multiple sources of data available and the extended time that was spent with the participants, case study methodology was an appropriate choice for this research.

Similar to other qualitative approaches, case studies are designed to gather information-rich, in-depth understanding of a bounded system, otherwise known as a case (Merriam, 2009). Case studies have been defined as "a qualitative approach in which the investigator explores a bound system (a case) or multiple bound systems (cases) over time through in-depth data

collection involving multiple sources of information and reports a case description and case–based themes" (Creswell, 2007, p. 73). A bound system or systems is the setting, context, relationships, and limits within the case or cases being studied. Yin (2009) defines case study as "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (p. 18). A case may involve an individual, several individuals, an event, programs, or activity such as teaching strategies and methods. The study of these cases involves gathering data that is not evident or shown well through experimental methods. Understanding the how and why of a case, through a case study, allows for a deeper understanding of the issues and processes associated within the case.

Through case study, researchers identify and select those cases that can inform the study's purpose and questions best through gaining access that surveys and questionnaires cannot provide. Case study research tends to be selective, "focusing on one or two issues that are fundamental to the system being examined" (Tellis, 1997, para. 29). Setting boundaries appropriate for the case allows the researchers to gain a greater understanding of the focused issues. Boundaries for this case study are discussed later in this chapter, in the research design section.

Selecting case study as the methodology and resolving boundaries are the first steps in designing a case study. Next, the researcher must decide what type of case study s/he will conduct. There are several approaches to conducting case studies. Baxter & Jack (2008) list case study classifications developed by Yin (2009) as single, holistic case studies, and multiple case studies, each of which may be explanatory, exploratory, or descriptive in nature. Case study classifications developed by Stake (2006) are listed as differentiation of case studies -intrinsic,

instrumental, and collective. Viewing case study as holistic has been challenged in recent literature. Bhattacharya (2009) argues that approaching case study as if it is holistic is difficult to establish "because the experiences of the participants can never be captured in their entirety or placed in neat categories, regardless of the amount of time spent in the *field*" (Bhattacharya, 2009, p. 116). Designing a case study around a bound system, the case, and creating the boundaries therein is counterproductive to a *holistic* case study. This is counterproductive, because on one hand, binding a case is already offering a limited focused perspective, and no matter how well a case is studied, it would be intellectually dishonest to claim that a holistic understanding has developed because our understandings are not static and the researcher and the researched would possibly evolve in their shared understanding of meaning making with changes in time and context. Therefore, at best, case studies are in-depth snapshots of that which is being studied.

Case studies can be single case or multiple case design based upon the research purpose (Tellis, 1997). Single case studies involve a "single entity, a unit around which there are boundaries", such as; a person, a group, process, program; a single emphasis of the study (Merriam, 1998, p. 27). Multiple case studies involve more than one entity or unit that is the focus of the study. A multiple case study is "research designed for closely examining several cases linked together… (or to) examine something having lots of cases, parts or member" (Stake, 2006, p. vi). School innovations, such as adapting school schedules over multiple campuses, new curriculum, or educational technology implemented on various campuses, are examples of multiple case studies. Multiple case studies allow the researcher to analyze within each case and across each case, examining several cases to gain an understanding of the similarities and differences (Baxter & Jack, 2008). Each individual case study consists of a "whole study," in

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which data is sought regarding the experiences and phenomenon of each participant. A cross-case comparison is conducted in order to develop themes and assumptions for the study as a whole. Cross-case comparison maybe used to identify similarities and differences in cases, and patterns in the data (Yin, 2009). Utilizing multiple cases or cross-case study strategy explains real life situations that are too complex for a single survey or experiment to capture (Yin, 1994). Therefore, since the purpose of this study was to describe the participants' experiences regarding the use of accessible instructional materials, in the form of digital text, in an inclusive classroom, this study was a multiple case study with each single descriptive case being a participant and her experiences.
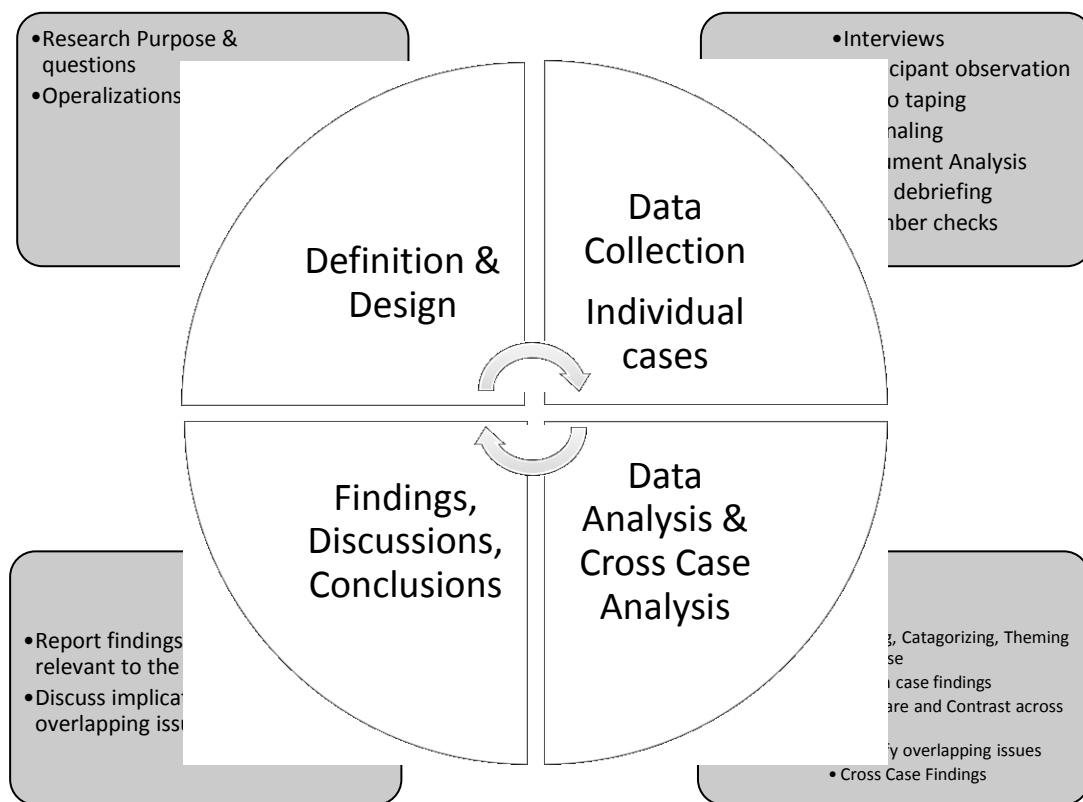
Figure 5. Graphic Design of Multiple Case Study

comparison process starting with the research purpose and questions. Data collection methods is next, which include interviews, observations, videotaping, journaling and document analysis, peer debriefing, and member checks. The quartered section for data collection connects one case

study to another indicating that these case studies are conducted simultaneously. A key part of Figure 5 is the arched arrows in the center of the figure. The arrows represent the circumstances where a discovery is made in one of the individual case studies or data analysis. This may result in the re-evaluation of the original research purpose and questions, categories and themes (Yin, 2009).

Data analysis as depicted in Figure 5 involves coding, categorizing, theming and conducting cross-case analysis when appropriate to compare and contrast against cases to prepare a final report. In this study, I followed the guidelines of Figure 5 for research design, data collection and analysis, and data representation. It is not the goal of this study to claim generalizability. Instead, the rich context-detailed description may allow the reader to create entry points to this study with ideas that resonate with their experiences, thereby creating transferability.

Theoretical Framework

This study is grounded in an interpretivist framework. Grbich (2007) explains interpretivism as "the way people interpret and make sense of their experiences in the worlds in which they live, and how the contexts of events and situations and the placement of these within wider social environments have impacted on constructed understandings" (p. 8). At an early age people begin to assign meaning to their interactions with other people, places, and objects in their world. These meanings maybe influenced by social status, race, religion, and education, amongst other things. It is through these meanings or beliefs that people assign value and interpret events and situations. Beliefs can have meanings that affect people at a personal level and/or a public, social level. How people make meaning of the events and situations in a public situation, may have an influence on how others will make meaning.

This study is more specifically grounded in a symbolic interpretivist framework. Symbolic interpretivism, also referred to as symbolic interactionism, is grounded in the foundational ideas of George Herbert Mead, a social psychologist (1863-1931). Mead gathered a group of fellow faculty members at the University of Chicago to form the group called Chicago School of Pragmatism. The faculty, led by Herbert Blumer, continued Mead's work which was instrumental to the foundation of symbolic interactionism (Burbank & Martins, 2010). Blumer (1969) identified three premises that describe symbolic interactionism:

- Human beings act toward things on the basis of the meanings things have for them.

- The meaning of things is derived from, or arises out of social interaction that one has with others.

- These meanings are handled in and modified through an interpretative process used by the person in dealing with the things he/she encounters. (p.2) (p. 2)

Symbolic interpretivism maintains that all social interactions come from the meanings assigned by individuals and groups to objects, places, and events in the course of everyday life (Gopal & Prasad, 2000). In education, teachers make meaning of their teaching, students' failures and successes, instructional strategies, accommodations, and mandates handed down through the law. These meanings come from the social interactions within the classroom and campus. As time passes and experiences change, meanings are modified. This study specifically explores the use of digital text in an inclusive classroom with implications for special education. Symbolic interactionism is an appropriate framework because disability and accommodations for students with disability is a key concept around which teachers make meaning and inform their instructional practices. Additionally, there has been an increasing emphasis on the Individuals with Disabilities Education Act of 2004 (IDEA 2004) that outline accessibility issues for

students with disability, which creates a fertile ground for inquiry about the experiences of teachers within this educational context.

For teachers, the emphasis on offering accessible instruction to the students could be a key symbol around which they make meaning and thereby inform their instructional design, implementation, and reflection on their instructional practices. These meanings as stated in the tenets of Symbolic Interactionism are also informed by their experiences in the classroom, with other teachers, and within the context of resources and support from administration. However, no such meaning creating around a symbol is static. Therefore, any meanings made by the teacher or by the teacher and the researcher should be read as evolving understanding without a fixed nature. The evolution of understanding one's experiences, according to the tenets of Symbolic Interactionism, is contingent on how one reflects on her experiences and modifies her position and understanding based on those experiences.

Subjectivity Story

Subjectivities are important aspects of constructing knowledge in qualitative research. Researchers are not expected to be devoid of subjectivities, but to acknowledge their subjectivities. Subjectivity in qualitative research is an individual's personal perspectives on events, feeling, position and beliefs that have been gathered throughout a person's life. According to Peshkin (1988), a person's perceptions, feelings and beliefs, at any given point, are like a garment that cannot be removed. A researcher can become aware of her subjectivities driven from the discursive subject positions of being a daughter, an educator, a mother, a wife, a graduate student, etc. that inform her values, beliefs, and assumptions. However, it would be inaccurate to claim that one can control or remove subjectivities out of one's studies. Therefore, it is academically accurate to reflect on one's subjectivities that one can identify, with the

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assumption that there might be more subject positions than what one is consciously aware of and documenting the role of such subject positions in one's study. The next few paragraphs chronicle my experiences with technology and the implementation of digital text within the district that I am employed.

The first time I saw a computer was in May 1985. I was just days away from graduating with a bachelor's degree in secondary education, among other degrees. However, before I could be allowed to walk the stage and graduate I was required to endure a two hour orientation to the computer. I arrived in a room, not much bigger than a closet, to find a table with a large box looking thing with wires and a keyboard sitting on it and two gentlemen waiting for me. They proceeded to show me the box looking thing and identified it as a computer. As they described what it could do, my word processor that I had used for the past five years was the only comparison I could make. I really had no clue what I had just seen, but they insisted I would need to know about this thing called a "computer". I cannot remember much else these gentlemen showed me that day, but they were right, I did need to know about that large box with wires and a keyboard. It was not long before I became familiar with the computer and what it could do for me and for students with disabilities.

Fast forward to 1991. I just started my first year teaching special education. There was an Apple IIE computer in my classroom and it was at this time that I was first introduced to assistive technology (AT).

The term "assistive technology" means technology designed to be utilized in an assistive technology device or assistive technology service, an "assistive technology device" means any item, piece of equipment, or product system, whether acquired commercially, modified, or

customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities. (Assistive Technology Act, 1998)

I did not know much about AT but I was intrigued by the possibilities it could provide for my students. There were not many commercially offered products available and funds to purchase items were not in my budget. I became involved in modifying and customizing devices for my students. The first modification I attempted was at a workshop offered at the Educational Service Center. I learned how to create switches for students who were non-verbal. Switches for this purpose are similar to a switch used every day to turn electrical items on or off. These switches, enclosed in a folder or flat disk, could be used to turn on an adapted tape recorder or device that had a recording stored. I learned how to wire and create a switch that could enable communication for students who were unable to speak. Since that time I have been fascinated by assistive technology. I began making switches and then learning more about assistive technology devices and software. I integrated technology and assistive technology into my classroom for the next 15 years. As the years progressed I modified and customized less as I was able to obtain more commercially-made products. Technology has evolved in the last 20 years; assistive technology devices both simple and complex are more prevalent in education.

Beginning in 2007, I started working as an instructional coach for the office of special education in a South Texas district with 58 campuses and an enrollment of 38,677 students. Parts of my responsibilities were to create a professional development plan to train teachers in the use and implementation of this new technology in the classroom. In 2009, it became a goal to integrate assistive technology into the general education classroom. It was our goal to help students access and progress in the general education classroom by using technologies such as text to speech, word prediction, and talking word processors. My district had implemented the

use of assistive technology into the classrooms that served the most significantly disabled students with good success. Our goal now was to reach those students with high incident disabilities in the general education classroom. High incidence disabilities are those disabilities that occur more frequently in the student population. We started looking into the mandates in the Individuals with Disabilities Education Act 2004 (IDEA) that mentioned accessible instructional materials. During the 2009-2010 school years, my district purchased technology to meet the needs of students using accessible text in classrooms and I was the project manager for the district-wide implementation of this technology. This was a continual process where new teachers were being introduced every day to this technology.

During the following three years I saw the struggles general education teachers experienced in their attempts to provide Accessible Instructional Materials (AIM). The teacher's frustration and struggles dealt with instructional design and incorporating Universal Design for Learning (UDL) strategies as well as struggles with the assistive technology that allow digital text to be accessed. Frustrations were evident as some teachers became aware of AIM and UDL strategies, and there was frustration with the laws that mandate the provision of AIM and with the lack of knowledge about the materials and technologies that are available. They experienced regret and guilt for not knowing about AIM and UDL strategies in previous years. Too often teachers had witnessed student failures; failures they felt could have been avoided if access and supports were given. Decisions that affected student success were made without teachers input or knowledge of the resources on hand.

In the Spring semester of 2011, I was excited about going to a campus and training a mother, Sue, on the usage of "text to speech" software so she could assist her teenage son, Mark, with his homework. Mark had been struggling with his reading class and she was looking for

answers. The plan was to meet both the mother and Mark in the campus library after school. All the computers on this campus had the "text to speech" software installed and this seemed the best place to meet. As I waited for the mother to come, I watched numerous students come to the library to check out books and use the computers; even other adults from the community came to the library to get assistance from the English as a Second Language (ESL) teacher. The library was much busier than I had expected. It was fifteen minutes after the scheduled meeting time when the Sue arrived. Mark was not with her and he had not answered her call to meet her. I thought perhaps the library was not the best location to meet. Mark may not want his friends to see him meeting with some strange lady and his mother! We sat for a couple minutes hoping Mark would respond and then continued with the training. Sue was excited about the supports her son could receive and thanked me for the training. It all sounded good, however it is what happened next that has stayed with me.

As we exited the library on our way to the front door, we met up with a teacher that Sue knew. As she talked with the teacher, it became apparent that this was Mark's former English teacher. I learned from their conversation that Mark had been failing his class and the Admission, Review, and Dismissal (ARD) committee decided the best solution was to remove him and put him in a more restrictive special education class. "I think it will be the best for him" the teacher stated. Not being a member of the ARD committee I could not speak to the decision process that led them to withdraw the student from the general education classroom into a more restrictive environment. However, doing so before giving the student access to the curriculum, through the use of digital text, and the supports that UDL and AIM could offer was of great concern to me. Teachers, administrators, counselors, paraprofessionals, and parents cannot provide support if they don't have the knowledge, training, and tools to do so. I felt saddened by

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what I had witnessed as we left the building. I don't know if Sue had any feelings as a result of the conversation or not, she did not say or show any apparent emotion. I kept my feeling to myself and wished her a good evening. As I drove home, I promised myself I would do whatever I could to keep this from happening to another child in our district. It is student success that drives me in my search for answers about how administrators, the district, and I can provide support that impacts instruction and student success in the general curriculum.

My subjectivity is my perspective on the events, feelings, positions and beliefs I have experienced throughout my life. I have specific beliefs and experiences regarding the education of students with disabilities. I needed to be aware of these beliefs as they may be different from those who participated in the study. I was also cognizant of the perception the participants might have of my position in the District and not use any of the data collected in a manner that could be harmful to the participants. At the same time, I did not withhold any needed support the participant may require in accessing the software or digital text. Regardless of my personal beliefs, I remained open to the experiences and beliefs of those who participated in the study. Establishing a trusting relationship with the participants through frequent member checks was essential to a successful study.

Research Design

Using case study, this study was conducted in the spring semester of 2013 on a selected campus in South Texas, involving two participants at that campus. As mentioned in the first chapter, the effective systems and practices that the AIM consortium recommends and the effect these systems have on the implementation of accessible instructional materials was an area of special interest. The two cases were studied simultaneously, data analysis of each case was completed separately, and data was processed through cross-case analysis. During the spring

2013 semester, the participants' classrooms were observed through videotaped and audio recordings and manual note-taking (Appendix A). Participants completed a TPACK survey and three interviews, one hour each, during a 12-week time period. Participant and researcher journaling, member checks, and peer debriefing took place after each interview and during data analysis. For the purpose of giving additional information into the culture of the Harper campus and their previous attempts to implement digital text, I included an interview from two indirect participants within case one. Details about these processes are elaborated later in this chapter.

Participant Selection

For the purpose of this study, I chose two participants from a South Texas school district for this dual case study. It was of interest to me how teachers experienced the implementation of AIM with the differentiation in resources and level of support offered by the district. Selecting participants who could offer valuable information regarding the implementation of AIM in the form of digital text was desirable. Since this was a qualitative study, purposeful sampling was used. Merriam (1998), defines purposeful sampling as the "assumption that the investigator wants to discover, understand, and gain insight and therefore must select a sample from which the most can be learned" (p.61). Teachers who had a history of implementing technology and using digital text for students with learning disabilities received primary attention. Gaining an in-depth understanding of the experiences teachers have implementing digital text was best served by selecting participants that were familiar with the technology and serving the target population. In addition to purposeful sampling, participants were also selected using a criterion-based sampling process. Criterion-based selection determines "a list of essential attributes" to the study and then "proceeds to find or locate" participants matching the list

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┌─────────────────────────────────────────────────┐
│     Participant Selection/Purposeful Sampling    │
└─────────────────────────────────────────────────┘
                        │
                        ▼
┌─────────────────────────────────────────────────┐
│              Criteria-Based Sampling             │
│   •  Certified teacher working in an inclusive   │
│      setting.                                    │
│   •  Has been trained and using "text to speech" │
│      software.                                   │
│   •  Teaches in South Texas.                     │
│   •  Has access to "text to speech" software.    │
└─────────────────────────────────────────────────┘
                        ║
                        ▼
              ┌───────────────────────┐
              │     South Texas       │
              │   School District     │
              └───────────────────────┘
                        │
                        ▼
              ┌───────────────────────┐
              │ Consultant selects 5  │
              │  potential            │
              │  participants         │
              └───────────────────────┘
                        │
                        ▼
              ┌───────────────────────┐
              │ Solicitation email is │
              │  sent out to          │
              │  potential            │
              │  participants         │
              └───────────────────────┘
                        │
                        ▼
              ┌───────────────────────┐
              │ Two potential         │
              │ participants are      │
              │ selected from email   │
              │ responses             │
              └───────────────────────┘
                        │
                        ▼
              ┌───────────────────────┐
              │ Potential participant │
              │ is contacted by       │
              │ phone/email. Consent  │
              │ Form is signed        │
              └───────────────────────┘
```
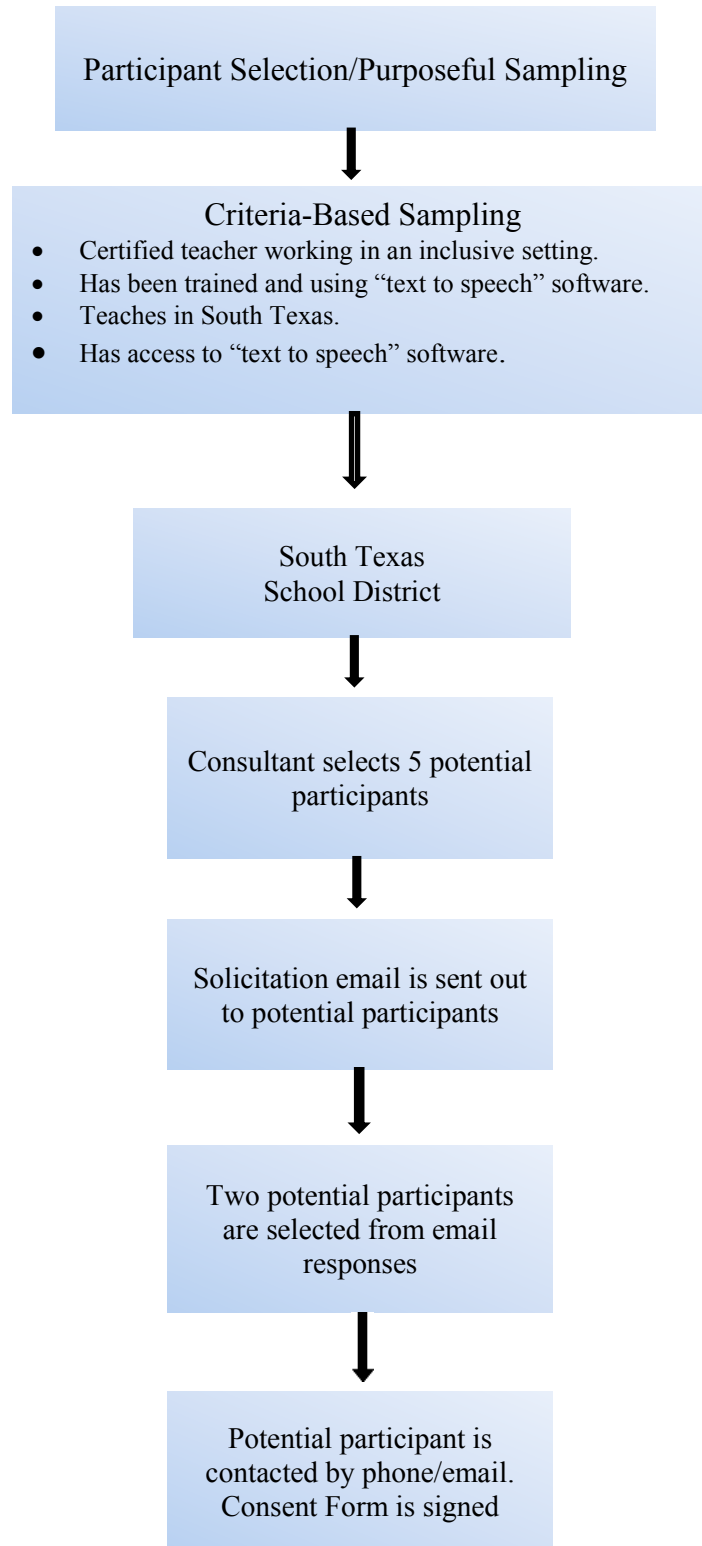
Figure 6. Participant Selection Process

(LeCompte & Preissle, 1993, p. 70). Potential participants had to meet following criteria: (a) Certified teacher instructing an inclusive class (a mixture of students with disabilities included in the class with their non-disabled peers), (b) Has attended training on and used text to speech software, (c) The teacher has access to text to speech software or devices, and (d) Teaches in a K-12 school in South Texas. While knowledgeable of the potential participants' qualifications, previous direct contact in the form of consultation or coaching was not a criterion. The participants selected in this study were classified as direct and indirect participants. Direct participants refer to the participants who consented to interviews, observation, TPACK survey, and supplying relevant documents that included their reflective journals. Indirect participants were considered valuable in adding information to the culture of Harper Middle School, the site of the study, but they did not have the depth of involvement in the study as the direct participants did. Indirect participants in this study included students and two campus leaders who were on the same campus as the direct participants.

The first stage of participant selection was to select the direct participants. The special education consultant of a selected school district (See Figure 6) forwarded me the names of five potential participants. I contacted the five potential participants via electronic mail.   One potential participant did not respond. Two potential participants declined to be a part of the study. Two potential participants agreed to be a part of the study and attended a face-to-face confidential follow-up meeting. During the meeting I further explained the study, participant expectations, and the risks and benefits to the direct participant. I then invited the potential participant to review the informed consent form and answered any and all possible questions regarding the study, expectations, and details outlined in the consent form. Only when the potential participant was fully satisfied with all responses, did I request a signature on the

consent form (Appendix B). The consent forms were then signed by me and a copy was offered to the participants. Participants were informed that they could leave the study at any time without penalty.

The two participants, Aubrey and Sunshine, who consented to the study, happened to also be connected to each other not only by working at the same campus but also by sharing a class period together as co-teachers. This shared experience of the participants' teaching environment informed how their "cases" were bounded. For the sake of this study the cases were bound separately apart from the common class period. Aubrey's case was bound by her daily schedule of in-class support/co- teaching classes in which she supported several teachers. Sunshine's case was bound by the one class period that Sunshine and Aubrey had in common, her seventh grade inclusion class.

The second stage of this study was to select indirect participants. Once Sunshine signed the consent form for the study, I visited her seventh grade class and told the students about the study and presented them with assent and consent forms (Appendix C). Students took home the consent form to their parents for permission and signature. Any student who did not bring the consent form signed was not observed or recorded for any informational purposes. Then I approached two administrators at Harper campus explaining the study and offering them a consent form where they were expected to participate in one interview only (Appendix D). Both Lois, the special education chairperson, and Elia, the campus instructional advisor, agreed and signed the consent forms.

Research Site

This case study included two participants from a school district in South Texas. Data collection and document gathering took place through email or on-site collection. I informed

district and campus administrators of the research study and gained permission for the use of any district property to be used in the gathering of data.

Researcher Role

A characteristic of qualitative research is that the researcher is the primary instrument for data collection, data analysis, and data representation(Grbich, 2007; Merriam, 2009). Early conversations of researcher roles in sociology refer to the researcher as either an insider or an outsider with certain advantages or disadvantages within each case (Merriam et al., 2001). Advantages to the insider role may involve sharing similar backgrounds and interests making rapport easier to establish. Shared experiences may lead to a deeper understanding while at times cause conflict by being too close to the situation to discover pertinent data. Disadvantages for the outsider may involve differences in backgrounds, unfamiliarity with the culture, location, and professions being studied. Advantages for the outsider role may present itself in the relationships with participants. Participants may be more willing to share information and deep personal belief to a stranger as this is perceived to be less of a risk than opening up to someone more familiar. On the other hand, participants might also feel more comfortable sharing information with someone that they consider an insider who would understand their experiences in a way that the participant would find it meaningful.

While one of these roles may be taken on at some point in the research process, the advantages and disadvantages may not be simple as the role of the researcher often becomes messy and fluid, moving from one role to another (Merriam et al, 2001). My role as a researcher was both an insider and an outsider within the parameters of the campus. I had an insider role through my specialty in working with students with disabilities and technology. I took on an outsider role in that I was unfamiliar with the, co-teachers, general education teachers, and the

campus culture. My participation as a researcher actively involved me as an insider and outsider in the study.

My subjectivity and experience in special education administration placed me inside the topic and my role in providing support and training on this topic allowed me to stay entirely outside looking in. I had provided services to Harper Middle School for the six years. It was not uncommon for the campus staff to recognize me as a district employee providing support to a specific program on campus. My prior experience in addition to my experience as a researcher allowed me to gain deep cultural insights, something I would have missed, if my time spent at the research site did not include the prior seven years. There were situations when my position with the district and role in assistive technology became influential within the research. This included times when my knowledge of technology and availability of new technology took on a consultant/coach role with the participants. The roles I negotiated and owned during the research process were messy at times. To keep myself aware of the fluid nature of my role, I kept a journal and participated in peer reviews to monitor and record my active participation. In the next section I discuss in details the data collection methods engaged in this study.

Data Collections Methods

The data collection methods engaged in this study were interviews, observations, and document analysis and a completion of TPACK survey. Observations were conducted in the participants' classrooms twice during the study. Participant interviews consisted of three interviews, approximately one hour each during a 12 week time period. Participants received and completed a TPACK survey. The purpose of this survey was to assess the attitudes and beliefs participants had about teaching and learning with the support of digital technologies. Member checks and peer debriefing took place after each interview and at the end of data

analysis. Table 1 provides an inventory of data documenting the 685 pages of raw data

generated in this study.

Table 1
Raw Data Inventory

Data Source	Number of pages per event	Number of pages in total
Bracketing Interview	4 interviews X 10 pages per interview	40 pages
3 one-hour interviews per participant (2 participant)	20 - 30 pages per one hour of transcription	150 pages
4- Classroom observations	10 pages per observation	40 pages
Member check	5 – 10 pages per session	35 pages
Participant journal	2 Journals - 10 pages each	20 pages
Journal reflections	5-10 pages per interview	45 pages
	5 pages per observation	35 pages
	3 Interviews	
	Antidotal notes	75 pages
Archival Documents	4 classroom observations and videotape	20 pages
	Lesson plans, class seating charts, emails etc.	150 pages
Peer Debriefing	15 interviews X 5 pages per interview	75 pages
Total Pages of Data		685 pages

Interviews

Interviews are a common method for obtaining information from someone. It is not

uncommon to witness interviews in our daily lives. We see them on the nightly news, daytime

talk shows, and sports news outlets. Interviews are a means by which stories and information are

communicated. Although interviews can be a common activity in our society, interviewing for

the sake of data collection in qualitative research is a structured process (Merriam, 2009).

According to Maccoby and Maccoby (1954) an interview is, "a face-to-face verbal

exchange in which one person, the interviewer, attempts to elicit information or expression of

opinions or beliefs from another person" (p. 499). Typically interviews are face-to-face

interactions with a researcher and participant in the same room. While Maccoby and Maccoby

(1954) describe interviews as a verbal exchange, there is much expression and communication

that is not verbal. Active listening is a fundamental technique for being a good interviewer.

Listening is actively attending to the verbal discussion while noticing non-verbal cues as well

(Dewalt & Dewalt, 2002). Non-verbal cues may be in the tone, cadence and rhythm of speech,

inadvertent movements of the body, eyes, and hands. Obtaining information and gathering

complete data involve being active in the interview, listening, watching, and noting observations

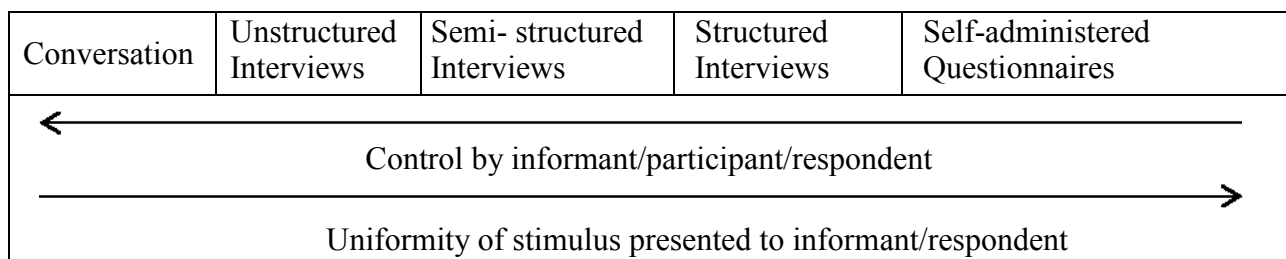at the same time. This information is vital to the understanding of the study.

Conversation	Unstructured Interviews	Semi- structured Interviews	Structured Interviews	Self-administered Questionnaires
←				
Control by informant/participant/respondent				
				→
Uniformity of stimulus presented to informant/respondent				

Figure 7. Interview continuums adapted from Dewalt, K., & Dewalt, B. (2002). Participant observation: A guide for fieldworkers. Walnut Creek, CA: Alta Mira Press.

Dewalt & Dewalt (2002) speak of a continuum of interviews ranging from conversation

to self-administered questionnaires. The continuum is twofold including the level of control by

the researcher and the extent to which the questions presented are uniform (see Figure 7).

Interviews can be primarily categorized into either structured or unstructured interview

strategies. Structured interviews have pre-identified problems and interview questions planned.

Unstructured, non-standardized interviews have problems that may arise out of discussions

between researcher and participants. Lincoln and Guba (1985) explain the difference between

the two types of interviews as follows:

The structured interview is the mode of choice when the interviewer knows what he

or she does not know and can therefore frame appropriate questions to find it out, while

the unstructured interview is the mode of choice when the interviewer does not know

what he or she doesn't know and must therefore rely on the respondent to tell him or her.

(p.269)

Qualitative interviews involve researchers who determine the research topic, initial questions and

the participant. Familiarity with a case will impact the type of interview process the researchers

utilizes. There may or may not be a previous relationship between the interviewer and

participant. Researchers usually establish rapport through interview strategies before inquiring

about the research topic at hand (DeMarrais & Lapan, 2004). Researchers must employ

interview strategies that enable rapport to be established and information to be gained.

For the purpose of this study, interviews followed a structured format. Using the research

purpose and questions as a foundation, specific questions were developed for the first and

subsequent interviews. The participants' responses prompted me to develop additional

questions. In this way, the interview took on a more unstructured format, even when it started

with a structured or semi-structured format. This study included three one-hour interviews with

each participant. Participants determined the location and time of each interview. The following

are questions that guided the initial interview:

1. Describe your classroom composition, highlighting the students with various

    disabilities and accommodations mandated.

2. Can you give me some examples of instructional strategies you use to help

    students with learning disabilities and or print disabilities?

3. Tell me about a typical planning process for developing lessons utilizing digital text.

4. Tell me about a student who might have overcome an obstacle as a result of using digital text.

5. Tell me about the support you receive from your campus administration and district Special Education Department. If the response is "no support", describe the type of support you need or would request.

The final interview followed the structured format of an elicitation interview. In this interview conversations were elicited around a task. Participants were asked to draw a picture about their experiences and then we shared a conversation about their drawings. The inclusion of non-linguistic aspects in research, providing the participant with an alternative expressive possibility, may allow the researcher to access and represent different levels of the participants' experience (Bagnoli, 2009). During the last interview, in order to elicit a further dialog and a deeper interaction with the participants, I asked the participants to create a timeline in the form of a graphical representation of their school year with the focus on implementing digital text into the inclusive classroom. Before the interview I sat out chart paper, markers, and colored pencils for the participant to use in creating the timeline. In addition, each participant was allowed to gather materials from their classroom to add to their representation. This interview was organized into four steps, first the participant created the graphical representation, then I asked the participant to add to the timeline their emotions, feeling, and reactions to the events they had included on the timeline. The next step was to look into the future and predict how they would approach the next school year with a continued focus on implementing digital text. After the third section, I asked the participant to describe their graphical representation and explain the

emotions included as well as their future visions. Following this activity I proceeded to ask a series of predetermined questions to end the formal interview. The creation of the graphical representation of the participants' experiences allowed me to clarify previous responses and elicit deeper considerations and understandings from the participant. For example, one participant, Aubrey reflected upon her usage of digital text and other technologies during times when various reports and special education documentations were due. She stated:

> I don't know how to say it nicely but usually in December I get caught up in progress reports and ARDs. And I do a lot less technology based instruction. I feel horrible saying that but then I'm going to give you the realities of teaching and especially of a co-teacher. It's not just doing progress reports for one subject, it's three subjects, so it becomes a lot.

Thus a combination of open ended interviews and elicitated open ended interviews allowed me to gain a rich understanding of Aubrey's experiences dealing with the demands of documentation and special education reports. By allowing this form of a conversation, I was able to generate a conversation directly driven by the participants' drawings instead of questions I prepared in advance. This allowed for additional insights that otherwise would not have been possible to gain without the elicited conversations.

I also employed member checks to assure accuracy of the participant's responses. Essentially, member checks are processes where there researcher returns to the participants and verifies accuracy of transcription and interpretation of data collected (Bhattacharya, 2009). In this example from a member check with Sunshine I asked questions to clarify her earlier responses regarding other teachers' methods:

> Debra: What makes you different from the other teachers?

Sunshine: I am willing to get up on the desk. I am willing to do some handstands. I am willing to read some questions with him. I just don't put on the audio book and expect them to get it. That's just not me. In order for them to understand what they are reading you have to continuously as why? You have to get into it with them. I cannot teach from behind the desk.

Providing the opportunity to correct and clarify data builds credibility in the findings (Lincoln & Guba, 1985). Being an active listener, attending to the nonverbal communication, using interactive interview methods, along with member checks provided the opportunity to gain a deeper understanding of each participant's in-depth understanding within the system of a bounded case.

Participant Observations

Participant observation is a powerful data collection tool that allows the researchers to gather data that is authentic and current to the activity being observed. Observation procedures vary as do interviewing strategies. Observations may be organized in many ways. Lincoln and Guba (1985) classify the observer being in a participant mode or non-participant mode. There is a continuum of participation in which the researcher can engage. This continuum involves the researcher making a choice to be an active participant, or a passive one, or a participant whose membership is somewhere between completely being active or being passive (Denzin & Lincoln, 2008). An observation may also be obvious or concealed. However, research ethics do not support concealed observation in most cases. Observations may also take place in the natural setting rather than a staged or contrived setting. For the purpose of this study, I took the role of someone who is peripherally or marginally involved. Observations took place two times during

the semester in the natural setting of the classroom for no longer than 60 minutes. I observed

overtly as a visitor in the classroom and was easily noticed by the participants.

The observations conducted could be categorized as descriptive observations. Descriptive

observations answer the, *who*, what, *where, why, and how,* questions about the environment that

is being observed (Spradley, 1980). Descriptive observations approach an activity without any

particular question in mind except "what is happening?" in the here and now and record as much

information as possible. Recording observation data should utilize a structured design for note

taking and organization of observations. Spradley (1980) identifies nine dimensions to describe

what is going on in a social setting such as a classroom. The descriptive observation matrix was

used for this study and took into account Spradley's dimensions:

1. Space-the physical place

2. Actor- the people involved

3. Activity- a set of related acts people do

4. Object- the physical things that are present

5. Act- the single actions that people do

6. Event- a set of related activities that people carry out

7. Time- the sequencing that takes place over time

8. Goal- the things that people are trying to accomplish

9. Feeling- the emotions felt and expressed

During the classroom observations and videotaping sessions, these nine dimensions were used

for data collection. I sought to provide a descriptive example of the environment, students'

actions and reactions, and teacher interaction with students. In Figure 8, a portion of Aubrey's

second observation was provided. After the observations were concluded, field notes were

written in a descriptive documentation of the situation. The observation notes were compared to

May 4, 2013 – Field Observations of Aubrey's Classroom Interactions
• 7th grade language arts class. Gen. Ed. Teacher is absent today. Aubrey begins instruction. Substitute is standing behind her and to her side. • One student is sitting in the front of the room at a computer (has out schedule and checklist of assignments) Three students go to a computer in front of the room to use a computer. Others go to the Library to complete an assignment. • Aubrey has great rapport with students. Almost like a stand-up comedian. Moving from one group to another. Redirect behaviors calmly.

Figure 8. Example of Field Note

the audio and or video recording that was collected for accuracy. I noted additional clarification

questions for future interviews. The combination of observations, interviews, preliminary data

analysis and informing future observations and interviews based on the findings from early data

collection sources allowed me to investigate deeper into the experiences of the participants and

the meaning we were making around those experiences.

Document Analysis

Documents are a rich source of data in qualitative inquiry. Lincoln and Guba (1985)

separate documents and records as two different sources of data. A record is a "written or

recorded statement prepared by or for an individual or organization for the purpose of attesting to

an event … a document… is any written or recorded material that was not prepared specifically

in response to a request" (Lincoln & Guba, 1985, p. 277). Reports, affidavits, or journals

requested by the researcher would be considered *records,* archived data such as transcripts, work

samples and personal journals would be considered *documents*. Documents collected during this

study included teacher lesson plans from previous and current semesters, classroom seating

charts, and emails. I also asked the participants to keep a reflective journal during the research

period. Additionally, participants took Technological Pedagogical Content Knowledge

(TPACK) survey taken at the beginning of data collection that allowed me to understand further contextual information about the participants.

I used these documents and records to inform the analysis of interview transcriptions and observation notes, which is a form of triangulation in qualitative inquiry. For example, the lesson plans and seating charts were analyzed to find patterns of pre-planned supports for students using digital text in the classroom. Participants' journaling, as shown in Figure 9,

> March 29th
> Crazy day today. Test coming up in science and I got the teachers set up with the software for the students. Got to say science teachers are on the ball with text-to-speech.
> Kids took test but only one wanted to use text-to-speech ☹ and only in Harpers Ferry.
> Worked with students in my resource class on outlines for their respect essay. Showed them the outline software. They sounded interested but I need to have a day set up for them to play with the program.

Figure 9. Entry in Aubrey's Participant Journal

allowed confirmation of findings and discovery of additional insights into the experience of the participant during this research period. Participants' journals were collected at the end of the research period.

Researcher Journal

Researcher journals, as Merriam (1998) describes, are an introspective record of the researcher's experiences in the field which include "ideas, fears, mistakes, confusion and reactions" (p.110) during the experiences of research. A research journal is also one of the steps a researcher can take to document trustworthiness in qualitative research. Lincoln and Guba (1985) suggest that researchers keep three journals. Which include (a) a log of day to day activities and timelines for completion, (b) a personal log or diary that includes reflective and introspective notes, (c) a methodological log to document decision or changes made in regard to

the methodology or research purpose and questions. I used one large journal divided into three sections for the research journals throughout the research process. The following example is from the methodological log I kept.

> April 15, 2013
>
> I spoke to my peer debrief buddy on her cell phone today. We talked about how much the participants talk like the digital text implementation was not a task but an identity. "We've got to do that, that's what we do!" is what I have been told a few times now. After the first interview I felt like this is more like this is so much more than these two participants. It's the culture of the campus. Kind of an expected service, not in the job description but clearly communicated. I am considering adding the Texas history teacher and the special education chairperson as indirect participants.

The research journal assisted my research by helping me, remain focused, process my observations, and experiences during the research process. These journals were analyzed and processed in the same matter as interviews and observation data.

Using a variety of data sources provided opportunities for triangulation as well as ensured increased rigor and trustworthiness discussed later in this chapter.

Data Management and Analysis

Data management involved working with and systematically reviewing and organizing both paper-based and digitally collected data. As represented in the data inventory, the data requiring organization and management consisted of interviews, informal observation notes, video recording transcripts and observation data, researcher's journal entries and memos, participants' journal entries, archival data, TPACK survey responses, member checks, peer debriefings, and bracketing interviews.

Printed copies of raw data were stored in folders and organized by participant and type of data. Digital copies of videotapes, interview audio recordings, were filed in folders on my laptop computer as well as my iPad. Data stored digitally was password protected on devices that were also password protected for security. Digital data was backed up daily in an additional storage source in case the computer or iPad were to crash.

In my journal and an iPad app called *Sound Note* for journal entries, observation notes, recordings of interviews and member check, and memos. The journal provided convenient recording space that I could manually touch and feel and pull out when I needed. *Sound Note* also allowed me to make voice memos while taking notes. Additional data management techniques involved creating conceptual maps that provided a visual overview of thoughts, reflections, and connections I made between different parts of the data as I progressed through the data analysis process.

Miles and Huberman (1984) state that data analysis consists of three concurrent activities; data reduction, data display, and conclusion drawing. Data reduction denotes the process of selecting, simplifying, abstracting, and transforming raw case data. Data display refers to the structured assembly of information to enable the drawing of conclusions. Conclusion drawing/verification comprises drawing meaning from data and building logical chains of evidence. According to Darke, Shanks and Broadbent (1998), several techniques used in Miles and Huberman's (1984) data analysis model are similar to those of grounded theory. These include,

coding of data segments into categories identified from the study's initial conceptual

framework or hypotheses, subsequent pattern coding to identify patterns or repeatable

regularities in the data, and memoing (making notes) as a step towards producing a

conceptually coherent explanation of the phenomenon being studied. (p. 285)

Using a blend of established methods this research study utilized thematic analysis as the data

analysis method.

Thematic Analysis

Thematic analysis is a process for identifying, analyzing, and reporting patterns and

themes within qualitative data (Boyatzis, 1998; Braun & Clarke, 2006; Thomas, 2008). Many

scholars (Boyatzis, 1998; Braun & Clarke, 2006; Guest, MacQueen, & Namey, 2012) have

sought to develop clear and precise guidelines for conducting thematic analysis in a theoretically

and methodologically sound manner. Braun and Clarke (2006) developed six phases for

thematic analysis. In this process, the researcher "begins to notice, and look for patterns of

meaning and issues of potential interest in the data…the endpoint is the reporting of the content

and meaning of patterns (themes) in the data (Braun & Clarke, 2006, p. 86)." Data for this study

were analyzed using a data-driven inductive approach, meaning the codes, patterns and themes

are strongly linked to data itself, not to preconceptions (Patton, 2002). This study utilized

thematic analysis as the data management and analysis method used to conduct the individual

cases and cross case comparison of the two cases.

The data analysis process followed the six phases as outlined by Braun and Clarke (2006)

in Figure 10. However, Braun and Clarke (2006) do not offer descriptive details of how these

processes are executed. Therefore, I used their six phases as a broad guideline and incorporated

specific analytical strategies as suggested by others to inform my data analysis process. Please

note that the analytical process is iterative instead of linear as represented in the figure below. In

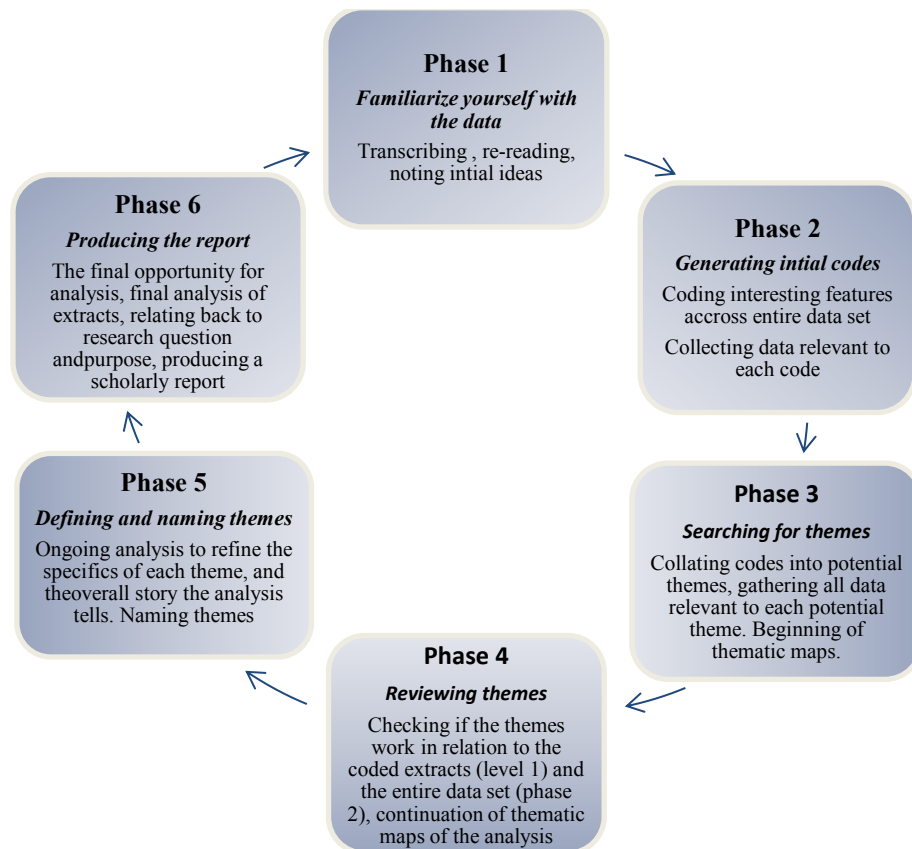the following section the six phases are elaborated.

```
                        Phase 1
                   Familiarize yourself with
                          the data
                    Transcribing , re-reading,
                       noting intial ideas

      Phase 6                                    Phase 2
 Producing the report                      Generating intial codes
  The final opportunity for                Coding interesting features
  analysis, final analysis of               accross entire data set
  extracts, relating back to
    research question                      Collecting data relevant to
  andpurpose, producing a                         each code
    scholarly report

      Phase 5                                    Phase 3
 Defining and naming themes                  Searching for themes
 Ongoing analysis to refine the            Collating codes into potential
   specifics of each theme, and             themes, gathering all data
   theoverall story the analysis           relevant to each potential
   tells. Naming themes                       theme. Beginning of
                                               thematic maps.

                        Phase 4
                    Reviewing themes
                   Checking if the themes
                    work in relation to the
                   coded extracts (level 1) and
                    the entire data set (phase
                   2), continuation of thematic
                     maps of the analysis
```

Figure 10. Thematic Analysis Process

Phase 1: Familiarizing self with data. According to Braun and Clarke (2006), this

phase involves the reading and re-reading of data, taking notes as each data set is read.

Transcribing interviews and checking for accuracy is key to a thorough understanding.

Regardless of whether the data is collected by the researcher or provided by the participant or an

organization, it is important to become immersed in the data. Transcription can be time

consuming and tedious, however it is an excellent way to familiarize oneself with the data

(Riessman, 1993). The collection of all verbal data was transcribed into written form. Once

transcription was completed, I checked the transcripts' accuracy by going back to the audio

recordings and checking line by line to assure the correct wording and emphasis was included.

When necessary I added descriptors of the participants' non-verbal behavior as well as pauses

and emotional feelings expressed. As recommended by Braun and Clarke (2006), the complete

data set was read in its entirety at least once before coding began. During the repeated readings,

I familiarized myself with the data, began to make notes and marked ideas for later stages of

coding. Re-reading written data, transcribing audio recordings and checking for accuracy

provided the foundation for the rest of the analysis.

  Phase 2: Generating initial codes. Braun & Clarke (2006) identify phase two as the

production of initial codes in a systematic fashion across all data sources. A code is a label given

to a section of a text to identify it as relating to an idea or issue in the data that seems important

and "refer to the most basic segment, or element, of the raw data" (Boyatzis, 1998, p. 63).

Charmaz (2006) recommends that coding is applied line by line, through all written text using

various coding methods, for interview transcripts, however Clarke (2005) stresses the need to

examine all data sources including interviews, observations, and document data in their entirety.

  For the purpose of this study, I coded all data sources. In vivo coding and values coding

as detailed by Saldana (2009), were used for all interview transcripts and participant journals in

addition to other coding approaches used in later phases. In addition, descriptive coding was

used for field notes, observation notes, lesson plans, emails and seating charts. In vivo coding is

a word or short phrase from the participants' actual words found in transcripts and descriptive

observations (Thomas, 2006). Values coding is the assigning of codes to data that "reflects the

participant's values, attitudes, and belief's, representing his or her perspectives or worldview"

(Saldana, 2009, p. 89). Descriptive coding condenses in a short word or phrase, most often a

noun, the basic ideas of a passage or document segment (Holton, 2010; Saldana, 2009). First I

coded words or phrases that were relevant to answering the research questions. I extended the

coded to include phrases and words with similar meaning. There were times when more than

one code was used on a single statement. (see Figure 11) Next, I reduced the data through values

coding. The values codes were distinguished through the use of a *V*: (value), *A* (attitude), *B*:

(belief) to indicate the type of value code. Saldana (2009) defines each type briefly,

> a *value* is the importance we attribute to oneself, another person, thing or idea; an *attitude*
>
> is the way we think and feel about oneself, another person, thing, or idea; a *belief* is part
>
> of a system that includes our values and attitudes, plus our personal knowledge,
>
> experiences, opinions, prejudices, morals, and other imperative perceptions of the social
>
> world. (pp.189-190)
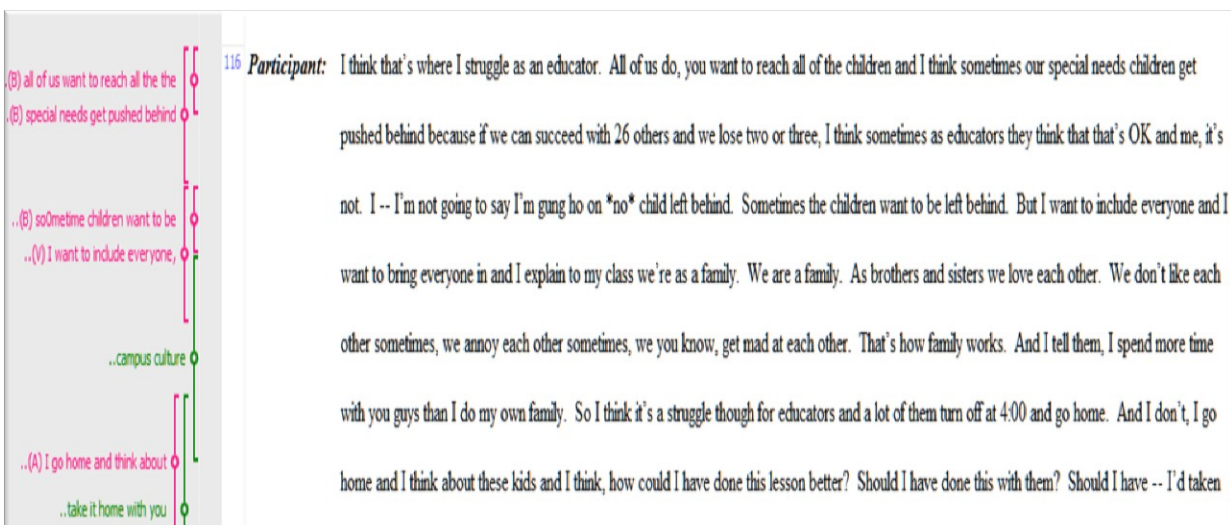
Figure 11. Values coding and in vivo coding in MAXQDA®

As a support during this stage, I placed post-it ® notes on my desk cabinet with the definitions of

value, attitude, and belief for coding purposes. Whenever I was unsure, I referred to these

definitions to stay consistent with my coding. The last step was to use descriptive coding for the

field notes, observation notes, lesson plans, emails, graphical representation, and seating charts.

When all data was collected a long list of different codes was created. In Aubrey's case, after

three interviews, two observations, two member checks, participant journal, emails, and the graphical representation conversation, I identified 603 codes.

In the beginning stages of research, coding was done manually, writing notes in margins, highlighting, underlining text, and the use of Post-it ® notes to flag data. As the research continued I searched for data analysis software to assist with the coding and thematic analysis stages. I first used Nvivo® to transfer the codes from the first interview transcripts that I had completed manually. I was searching for a program that would allow me to code the data on each case separately while under the same project. I did not want to see codes for one case while I was working in the other case. It was important to me that the each participant's experiences would be analyzed and reported individually and not additionally influenced by the other case. Given that both participants taught at the same campus and shared a common class period, there was already a convergence of data present between the two cases. Unsatisfied with the features in Nvivo® I continued my search and found that MAXQDA® was the most useful software for my needs. The important task in this phase was to ensure all actual data was coded and gathered under each individual case. Using MAXQDA® I continued the coding process.

Phase 3: Searching for themes. In this phase the focus is on the "broader level of themes, rather than codes, involving sorting the different codes into potential themes, and collating all the relevant coded extracted within the identified themes…considering how different codes combine to form an overarching theme" (Braun & Clarke, 2006, p. 89). The main focus of this phase is to create reduced data chunks that are similar in meaning and identify potential themes from the collated data. Themes are a unit of meaning that are observed throughout the data (Guest et al., 2012). Essentially I started out analyzing the codes from each case, considering how the codes blended to form the initial themes or categories. Therefore, this

phase is not the final phase of identifying the thematic findings, but a step in that direction.

Further, Braun and Clarke (2006) suggest the in this beginning stage of searching for themes in order to visualize the process that researchers develop thematic or conceptual maps that demonstrate the data connection process to identify potential themes. Grbich (2007), claims, "Conceptual mapping provides a simpler, more flexible picture" (p. 33) of themes and findings. Producing a visual representation allows the researcher to view the data in multiple formats. This visualization contributes clarity to coding, categorizations, and themes that were extracted. I began to go through the codes and potential themes to continue to break them down into more common concepts. The use of thematic maps assisted me in determining and recognizing the salient topics and themes that I was seeing in the data. In Figure 12, I have provided an example
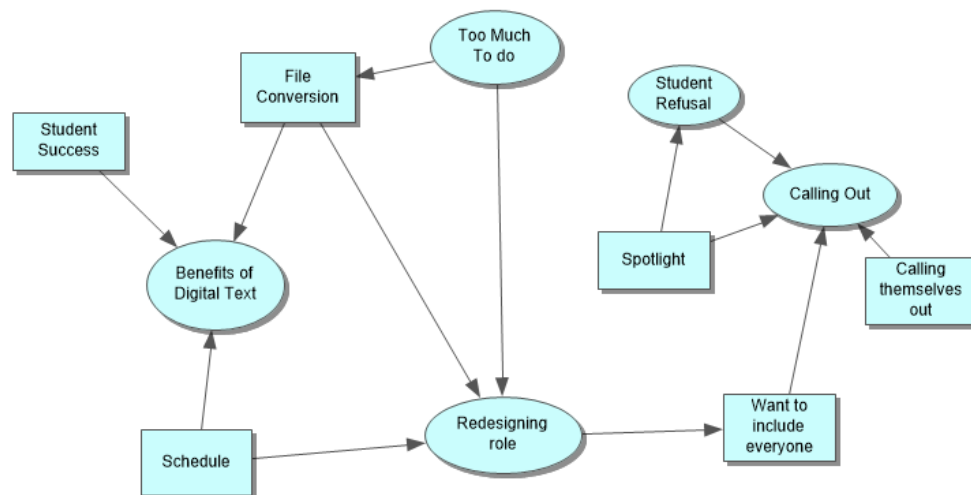

Figure 12. Section of the Thematic Map for Phase 3 – Finding Value in Assistive Technology of the thematic map showing a portion of Aubrey's codes and potential themes from this early stage. The 603 codes identified in stage two were broken down into 21 potential themes. For example, in Figure 12, the text in the bubbled shapes are the potential themes, such as too much to do, benefits of digital text, student refusal and calling out. These are not the final themes but a

potential bridge to identify the final themes. The text in the rectangular boxes represents codes that inform the potential themes.

The process of identifying potential themes was not clearly detailed by Braun and Clarke. Therefore, I analyzed and combined codes into potential themes through the use of focused coding (Saldana, 2009). This process involved looking for the "most salient categories" in the entirety of the data and "required decisions about which initial codes make sense" (Charmaz, 2006, pp. 46-57). The goal of focused coding was to develop categories (potential themes) by searching for the recurrent or significant initial codes "without distracted attention to their properties and dimensions" (Saldana, 2009, p. 155). I also used information from the previous phase to connect to the data analysis process of this phase. Once the potential themes were identified, it was time to move to phase 4.

Phase 4: Reviewing themes. Phase four began when I had determined the list of potential themes and involved the further refinement of the potential themes. According to Braun and Clarke (2006), this phase includes two steps of review and refinement. The first step includes reviewing each coded segment of data for each potential theme and determining if there are any coherent patterns present. If the themes do not meet this standard, they were reworked to create a new theme or blended into another existing theme. The next step, as recommended by Braun and Clarke (2006), follows a similar process referencing the entire data set. Each theme is evaluated to assure that it accurately reflects the data as a whole. I started with a collection of potential themes and began the process to refine, rework and rephrase these themes. I reviewed the raw data checking for additional data that could have been missed. Using the research purpose and questions, as my central focus, I constantly reflected back to determine if the themes were authentic to the data. At the completion of this step, I expanded the thematic map (Figure

13) to include the candidate themes. Review and refinement of the data continued until the map

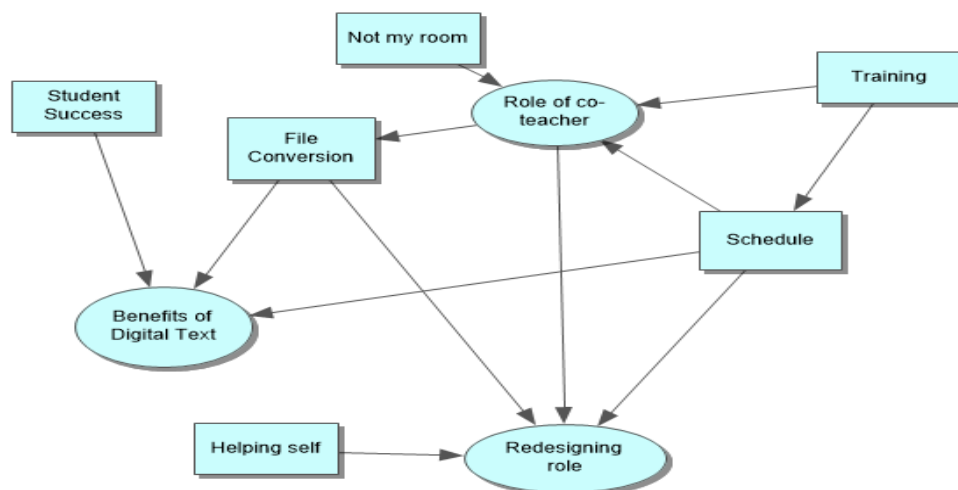was adequately completed. For example in Figure 13, the text in the bubbled shapes is the main

Figure 13. Section of the Thematic Map for Phase 4 – Finding Value in Assistive Technology

themes, such as role of co-teacher, redesigning role, and benefits of digital text. The texts in the

rectangular boxes represent codes that inform the potential themes. At the end of this phase I

had acquired a strong determination of the different themes, how they related or contradicted

each other and an overall story to present.

Phase 5: Defining and naming themes. This phase includes further refinement of the

themes by identifying the core of each theme's message. Braun and Clarke (2006) clarify

defining and refining as "identifying the substance of what each theme is about and determining

what aspects of each theme captures" (p. 92). This was not a mere paraphrase of the data, rather

a deep and rich look at the understandings each theme offers. Discovering the interaction of

codes, and themes in this study involved the repetition of review and refinement before the

analysis proceeded to an interpretive phase with final themes(Fereday & Cochrane, 2006).

Tracing themes back through categories, codes, and raw data, I considered where each theme fit

within the overall story and how they related to each other. Through member checks I was able

make connections to the participants' experiences and discovered the value and meanings they

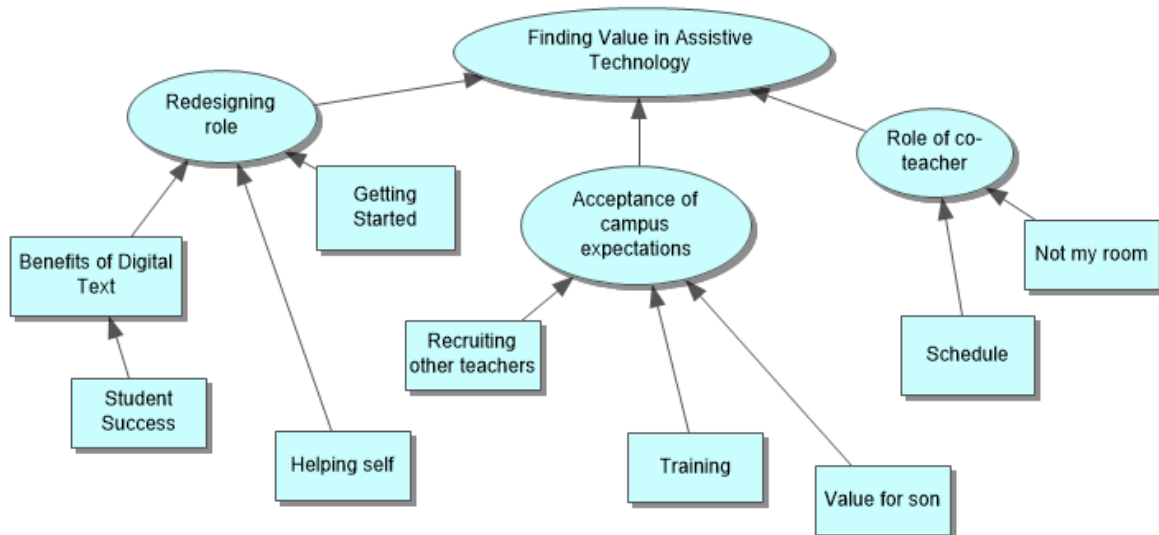had attached to these experiences. This allowed me to make connections between the raw data

Figure 14. Defining and Naming the Theme for Finding Value in Assistive Technology

and themes that ultimately were named to reflect the participants' experience. I reviewed the

thematic maps (Figure 12 and 13) developed in earlier phases and adjusted to show the flow of

ideas and findings. During this phase I established the final name of themes by returning to the

raw data to ensure a strong connection to the findings. In the example in Figure 14, I connected

the codes, potential themes included in Figures 12 and 13, into a final theme of *Finding Value in*

Assistive Technology, to represent the findings of the data collected in Aubrey's case study. For

example the bubbled shapes in Figure 14 are the revised main themes of redesigning roles,

acceptance of campus expectations, role of co-teacher and the defining of the final theme

Finding Value in Assistive Technology. This final theme resulted from a process of review and

refinement of from coding to identifying potential and main themes.

Phase 6: Producing the report. The last step was writing the final report for each individual case (Braun & Clarke, 2006; Charmaz, 2006; Stake, 2006; Yin, 2009). In these reports I revisited the research purpose and questions, telling a story of each participant's experience through the themes discovered. During the analysis and reporting of each individual case, I wrote in my journal salient ideas and thoughts related to the cross-case comparison. After the report for each case was complete I began a cross-case comparison, reviewed my journal notes, looked for similarities among cases and themes as well as differences and issues between cases.

By conducting the cross-case comparison, I revisited the data analysis conducted in phase four and five in what became a comparison and contrast of themes across the two cases (Stake, 2006). The comparison began with a review of the final themes from each case. Themes that had similarities I reviewed and revised into a combined theme for the comparison. Next I differentiated among the themes and compared the data in the same manner as was done with the similarities, reviewing back against the raw data to bring out the true meaning and implications. When similarities and differences were identified, I then revised themes to reflect the findings of the comparison. I completed a final report to describe and explain the issues and highlights in the cross-case comparison. All preliminary and final findings were verified, through member checks by the participants for their accuracy and rigor. A discussion of contributions to and points of transferability closed the report.

Reciprocity and Ethics

As I conducted this research, I was careful to be considerate of the ethical issues surrounding anonymity, confidentiality, and reciprocity. As Creswell (2007) emphasizes, we should be sensitive to ethical considerations throughout the research process. This included my

role in the case study as well as the manner in which I secured data and protected my participants from undue risk. The risks of participant's identity being released may cause stress and undue attention. To ensure participants' anonymity, I used pseudonyms, selected by the participants, for themselves and their location so that the fear of possible retaliation from administration was minimal. I oriented the participant to the research by review of the participant's roles and perceived risks as well as my subjectivity and role as the researcher. Consent forms and contact information were explained and collected. At all times participants had the right to leave the study and discontinue their approval to use documents collected. I presented a brief explanation of this study to the participants' classroom and answered all questions the students brought up regarding the study. I protected student anonymity through the use of a code based on whether or not they had consented to being videotaped during the observation sessions. Consent forms were given to the parents of the students and collected privately. At any given time during a videotaping session any student who did not have a consent form turned in was not videotaped. At that point I stopped the video discretely and continued to take notes by hand until the teacher's interaction with that student was finished.

Probably the most relevant ethical crossroad in this study was my current and previous role in the district and my service to the Harper campus for the last seven years. During those years I had inside knowledge to events and experiences the campus had with digital text. I was aware of the campus' history of trainings and had led many of the trainings myself. I was also privileged to conversations with the campus administration regarding the implementation of digital text. Through my experiences I found myself expecting and pushing the Harper administration to do more with their current knowledge, helped solve issues that may have been the responsibility of another district employee, and coached them to take the next steps. This

included researching solutions to the new Smartboard® Sunshine received and suggesting that Lois contact the high school to begin the transition of their eighth grade students. This transition was essential to the continued success of the Harper students. At times I felt conflicted in the blending of the insider/outsider role I played. However, I chose to conduct myself much as I would have if I had been there as a district support personnel. I could not keep information or knowledge from the participant merely to maintain and outsider role. As not to compromise the anonymity of the participants I would make sure I visited the teacher I typically would visit each time I entered the Harper campus. This would keep administration as well as other teachers from identifying my purpose or my participants.

As a visitor in the participants' classrooms I was cognizant of the gift they were giving me in their willingness to participate. Reciprocity is the "giving back to the participant for their time and efforts" (Creswell, 2007, p. 44). I reciprocated their efforts during this study by showing respect for their environment and experiences. I also offered my time and talent in the form of job embedded training or professional development. Job-embedded training is coaching or professional support given to the teacher by another professional in the natural environment of teacher.

<div align="center">**Trustworthiness and Rigor**</div>

During this study, I ensured rigor and trustworthiness through providing clearly written research purpose and questions, designing a case study design that is meaningful and serves the purpose of the study, using purposeful sampling strategies that are appropriate for the case study, managing, collecting, and analyzing data carefully (Russell, Gregory, Ploeg, DiCenso, & Guyatt, 2005). I maintained detailed field notes that included, as suggested by Lincoln and Guba (1985), a log of daily activities, reflective personal log, and a methodological log. During the data

collection process, I participated in member checks with participants. Participants were encouraged to discuss and clarify the interpretations and contribute new or additional perspectives (Baxter, 2008). I included additional methods such as peer review and triangulation in the study to increase trustworthiness in the analysis.

Lincoln and Guba (1985) recommend three activities to increase the probability of producing credible findings. These are prolonged engagement, persistent observation, and triangulation. Prolonged engagement is the investment of time to achieve the purpose of the study. In this study I dedicated time to conduct a literature review of empirical studies in the areas of UDL and TPACK among others in order to orient myself in the situation. I also dedicated time for three interviews and three classroom observations/videotaped sessions for each participant. Persistent observation is to "identify those characteristics and elements in the situation that are most relevant…and focusing on them in detail" (Lincoln & Guba, 1985, p. 304). I engaged in data analysis that provided an in-depth saturation of the data through an iterative process of data analysis. This involved detailed data analysis as explained in the six phases of thematic analysis. Triangulation is the use of multiple data sources to confirm findings (Merriam, 2009). For the purpose of this study, I triangulated findings through multiple data sources such as observations, interviews, videos, participants' journals, and lesson plans for each case study. The assembly and comparison of this data enriches data quality (Knafl & Breitmayer, 1989). As the research developed and deepened, new issues were observed, steps were taken to triangulate these finding among and within the other data sources.

Engaging in reflection as a researcher was another method for ensuring credibility and rigor. Reflexivity is "the process of reflecting critically on the self as researcher" (Lincoln & Guba, 2000, p. 183). I engaged in keeping a reflective personal journal to clarify my experiences

and assumptions during the research process. In addition, I engaged in peer debriefings with two peers throughout the research period to review and discuss the research process and findings.

Peer debriefing is the "process of exposing oneself to a disinterested peer" for the purpose of "exploring aspects of the inquiry that might otherwise remain only implicit" in the researchers mind (Lincoln & Guba, 1985, p. 308). The debriefing sessions allowed for discussions of findings and providing assurances that findings are credible. Transparency in the data collection and data analysis process, through reflective journaling and peer debriefing, added to the rigor and trustworthiness of this research. Applying the techniques mentioned above   provided significant rigor and credibility to this study.

Data Representation

The method of communicating the findings in case studies was the result of constructing the experiences and meanings of events through the eyes of the participants in a manner which portrays an accurate image. As detailed in phase six of the thematic analysis process, each case study was treated as an individual case study first. Data was gathered, and processed through a series reviews and revisions of codes and themes. After each case study was reported and findings noted, a cross-case comparison of the two cases began. A deep understanding of each participant's experience provided a fundamental connection to the comparison of each case. The cross-case comparison consisted of identifying the similarities and differences in each case as well the patterns in themes that were discovered between cases. I checked back to the original data frequently to ensure the integrity of the findings. When similarities and differences were identified, I then revised themes to reflect the findings of the comparison. I completed a final report to describe and explain the issues and highlights in the cross-case comparison.

Summary

In Chapter 3, I have discussed and defined case study methodology and provided a detailed description of the cross-case comparison process of this study. Next, I offered a review of Symbolic Interactionism and my subjectivity story. Additionally, I provided detailed descriptions of the research design, multiple research sites, and the participant selection process. Then I outlined the data collection methods and procedures. These included interviews, participant observation, document analysis, and fieldwork journaling. Further sections provided detailed descriptions and examples of the six phases of the thematic analysis process including thematic mapping. I inserted figures and tables throughout to support the description of the study, participant selection process, thematic analysis phases, and other descriptions where appropriate. The final sections provide information on reciprocity and ethics, and trustworthiness and rigor. In the next chapter I detail the findings of the individual case studies followed by the conclusions and implications identified through the cross case comparison.

CHAPTER 4: FINDINGS

This study is grounded in the theoretical framework of Symbolic Interpretivism. Blumer (1969) maintains that human beings act toward things based upon the meanings things have for them, and the meanings that are derived from or that arise out of social interactions with others. These meanings are handled in and modified through an interpretative process used by the person in dealing with the things he/she encounters and experiences (Blumer, 1969, p. 2). In education, teachers make meaning of their teaching, student successes and failures, and the social interactions within the classroom and campus. Specifically, within the context of accessible instruction, teachers are constantly making meaning of their experiences in terms instructional design, performing their jobs as educators, meeting the needs of a diverse group of learners, and negotiate the terrain of public education with mandates from policy makers. The experiences and struggles that teachers deal with during the school year may also effect the previous beliefs and meanings that they have formed. Moreover, teachers' private and professional lives are intertwined and how teachers experience and make meaning of their personal and professional lives influences how they conduct themselves in and out of the classroom.

The findings in this chapter provide a transient representation of the participants' attitudes, beliefs, values, and experiences as it pertains to the implementation of digital text in the inclusive classroom. The reason these representations should be read as transient because these representations provide a shared understanding of the participants' experiences filtered through my cognitive processing while I conducted the study. It would be intellectually inaccurate of me to claim that I have captured some truth that is fixed or can be replicated. Instead, what I claim is a rich, descriptive detail reflecting co-constructed narratives, which are subjected to change as participants' negotiate further the ways in which they interact with accessible technology. The

goal of reporting these case study findings is to share the participants' experiences in a manner that resonates with the reader in similar contexts. Maintaining a focus on the research purpose and questions assisted me in sorting through raw data (Baxter, 2008) during the data management, reduction, and analysis stages. This study was guided by the following research questions:

1. What are the experiences of the participant in using digital text in the inclusive classroom?

2. In what ways does the participant describe the various digital text resources they use in the inclusive classroom?

The findings in the chapter provide the reader with a description of the research site, an introduction to and description of the participants, and a TPACK profile for the primary participants, Aubrey and Sunshine. I have provided the reader with a detailed look at the Harper Middle School culture of digital text and their history of implementing digital text in the inclusive classrooms. Following the descriptions and profiles, I have provided an individual case study analysis for Aubrey and Sunshine. Aubrey's case is divided into three themes which are: (a) Finding Value in Assistive Technology: Aubrey's Journey; (b) It's All in How you Save It: Moving Toward UDL; (c) Don't Call Me Special: The Challenges of Implementing Accommodations. Sunshine's case is divided into three themes which are: (a) Yin to My Yang: The Interdependency of Teamwork; (b) It Just Became a Projection Screen: I have Never Not Reached a Student; (c) Palm Tree in a Hurricane: Overcoming Challenges. This chapter concludes with a cross-case comparison based upon similarities and differences among cases. This comparison is divided into three themes which are: (a) Don't Call me Special: See What I

See; (b) It's My Room: It's Not My Room; (c) Responding to Challenges: It's Personal. I

conclude this chapter with a summary of findings.

Research Site

It is a usual working day, hot and windy, while visiting campuses throughout this south

Texas district. Driving from campus to campus I have noticed that there are specific

characteristics in campuses that make each stand out from the crowd of cookie-cutter layouts that

look the same, however positioned differently from one location to the next. Harper Middle

School is no exception, nestled in a quiet residential neighborhood, surrounded by a golf course

and open fields, yet Harper's own personality stands out. As I drive up to Harper, following the

bending road to the main parking lot, I see students out on the field working in small groups

perhaps on a project or playing tennis at the tennis courts. On most days there are many

activities to be witnessed. What I like most about Harper is that there is always a place to park

up close. In my daily experiences, on various campuses, parking can make me feel as if I am

intruding upon a closed community, but not here. Pulling in to park I feel welcomed.

Entering the campus, I am welcomed by signs from administration asking visitors to

check in at the front office, banners touting campus achievements, current events and painted

inspirational quotes on the campus walls. While these may be seen as just banners or fancy

words, Harper Middle School feels genuinely welcoming guests. It is common for a student to

stop to see if I need directions or for teachers to wave and call out to me as I walk on campus.

On most visits, as I log into the campus visitors center in the front office, the principal motions

for me to visit with her in her office. Some days she may ask me about a particular teacher I am

working with, but today she does not. Today I am there to meet with the participants Aubrey,

Sunshine, Lois, and Elia, as a researcher.

Harper Middle School serves approximately 550 students from grades six through eight. The special education population makes up approximately 12 percent of the student population and is served by two self-contained program teachers, two resource/in-class support teachers, and 28 content specific or elective teachers on the Harper campus. As with other campuses through the district, Harper has installed and implemented software that includes text-to-speech, a talking word processor, and writing supports throughout the campus. Just outside the office there are pathways that lead to four wings and one indoor central hub of classrooms. Harper is an outdoor campus with most classrooms opening up to outdoor covered walkways between wings. Each wing serves a particular grade level or set of elective courses. Some trees are present in the front of the school, however between wings it is mostly open patches of grass. This allows the winds to blow freely on the hot Texas days and rain wets the sidewalks on rainy days. The campus is quiet, with the exceptions of a few teachers I meet on my way, until the bell rings to usher in a new class period. At that point, students rush out of classrooms doors, which lead to the covered walkway, and fill the air with the energy and excitement passing periods can bring. Through the rush of students' laughter and conversations with teachers I finally reach my destination and participants.

Participant Descriptions

The participants in this research study, Aubrey, Sunshine, Lois, and Elia, have all taught at Harper Middle School during the process of implementing digital text on campus. Together they possess 27 years of teaching experience in the public school system. This research is bound around two individual case studies. Aubrey is the primary participant and focus of the first case and Sunshine is the primary participant and focus of the second case. However, in order to gain an in-depth understanding of their experiences, additional participants who could offer some

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contextual information were selected. For the purpose of providing additional information into the culture of the Harper campus and their previous attempts to implement digital text, Lois and Elia were selected to participate in this study.

It is important to clarify some terminology that is used by the participants as they refer to their roles and titles. When campuses determine the model of support that they will provide for students in an inclusive setting, there are many service models that may be selected. Co-operative teaching is an instructional delivery strategy in which two or more certified content teachers share the roles and responsibilities of instruction in the same classroom simultaneously. In-class support is an instructional delivery strategy in which two or more teachers, one with content certification, and one without content certification share the roles and responsibilities of instruction in the same classroom at the same time. Harper Middle School has adopted the model of in-class support. However, it is not unusual for teachers to refer to a teaching partnership as *co-teaching* for any teaching situation that involves two teachers in a classroom at the same time. In this study the title *co-teaching* is used by the participants to describe the role or title of an *in-class support* teacher.

Elia was selected to participate in this study to provide background and historical context as well as clarify the experiences of the primary participants. Her role and experience at Harper provides a deep understanding of the campus experience. Elia has been working with special education students at Harper Middle School for fifteen years. During her years at Harper she has served as a paraprofessional and a classroom teacher. During the last five years she has served as a resource language arts teacher for sixth through eighth grade and later added three co-teaching classes to her schedule. For two years, Elia was partnered with Sunshine as co-teachers for seventh grade language arts. This last school year Elia moved out of the classroom into a

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leadership role. She is the Instructional Teacher Advisor (ITA) and Parent Facilitator at Harper.

Her new role is much different from a classroom teacher, in that she has less contact with

students and more time assisting teachers with administrative requirements and instructional

strategies. The most significant change for Elia is that she is no longer an equal peer with the

campus teachers. Like the other supporting participant, Lois, her new role includes more

responsibility and her decisions carry more weight now than when she was a co-teacher on

campus. Elia has been working with digital text in the inclusive classroom for three years. She

has received training on instructional strategies and software that support the usage of digital text

as well as experience using Bookshare.org to access digital text books. Therefore, Elia offers

rich contextual information about the culture of Harper especially in the process of integrating

digital materials in Harper campus.

Lois was also selected to participate in this study to provide background and historical

context as well as offer clarification to questions that arose from working with the primary

participants. Her role and experience at Harper provides a deep understanding of the campus

experience. Lois has been teaching special education at Harper Middle School for ten years.

During her ten years Lois' role on campus has changed. Previously she held the role of a

resource language arts teacher and then became a full time special education department

chairperson. In the last three years, due to changes in staff allocations, Lois has added the role of

lead teacher for a behavioral support program to her campus role as chairperson. Her

responsibility is to teach social skills to students that participate in the behavior support program.

She chairs all Admission, Dismissal and Review (ARD) meetings, assists in the implementation

of students' Individual Education Plan (IEP) and accommodations, and communicates with and

assists teachers with the implementation of resources and accommodations within the classroom.

She also investigates and finds solutions to situations where students are not being academically successful. Lois has been working with students using digital text in the inclusive classroom for the last three years. She has received training on instructional strategies and software that support the usage of digital text.

In contrast to Lois and Elia, Aubrey is new to the Harper campus. Aubrey has been teaching special education for three years. This school year is her second year at Harper Middle School. She was originally hired as a life skills teacher three years ago. However, her contract was not renewed due to budget cuts at the end of her first year. After a year of teaching in a private school serving children with autism spectrum disorders, Aubrey took a year off. During this year Aubrey gave birth to her first child. Shortly after the birth, Aubrey was informed that her baby had been diagnosed with Down syndrome. The demands of raising a child with a disability prompted Aubrey to return to Harper as a resource language arts teacher taking the position Elia left when she was promoted to the campus ITA and parent facilitator roles. During this year, Aubrey's role and responsibilities changed. Aubrey's journey to understanding and identifying her role along with her introduction to digital text is discussed in later sections of this chapter.

Unlike Elia or Aubrey, Sunshine has eight years of co-teaching experience on her resume. Sunshine has taught general and preparatory Advanced Placement (pre AP®) courses for thirteen years. She started as a seminar instructor at a local university and later became a middle school language arts teacher. She taught language arts in a co-teaching model at one other middle school before she came to Harper in 2008. She credits her experience in co-teaching as the reason she was hired at Harper. During her years at Harper she has taught sixth and seventh grade language arts. Her classes consist of inclusion, regular, and pre-AP settings.

She has been in a co-teaching partnership with both Elia and Aubrey during the past three years. Sunshine's experiences using digital text in the inclusive classroom are discussed later in case two.

Technological, Pedagogical, Content Knowledge Survey

At the beginning of this case study, Aubrey and Sunshine participated in a self-assessment of technology skills. The purpose of the survey was to gain an awareness of the participant's self-assessment of their technology and instructional skills in the literacy content area as it relates to TPACK. As discussed in Chapter 3, TPACK consists of Technological Knowledge (TK), Pedagogical Knowledge (PK), and Content Knowledge (CK) and Technological, Pedagogical, Content Knowledge (TPACK). The TPACK survey also serves as a data source for triangulation of findings and understandings gained.

Aubrey's TPACK survey. In a self-assessment of technology and instructional skills, represented in Figure 15, Aubrey expressed the ability to learn technology easily, keep up with important new technology, and solve her own technology problems. She also expressed confidence in her ability to use technology skills to implement and use technology in the classroom. Audrey also expressed assurance in her ability to teach lessons that appropriately combine literacy, social studies, technologies, and teaching approaches. She is able to use a historical or literary way of thinking and employs various teaching approaches to guide student thinking in the areas of history and literacy. She credits herself with the ability to assess student performance, and adapt instruction based upon student needs and learning styles. She is able to assess learning in many ways, use a wide range of teaching approaches in a classroom setting, and identify common misunderstandings and misconceptions, as well as organize and maintain classroom management.

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Aubrey stated that she has confidence in her ability to choose technologies that will enhance the teaching approach and student learning for a lesson. She agreed that her teacher
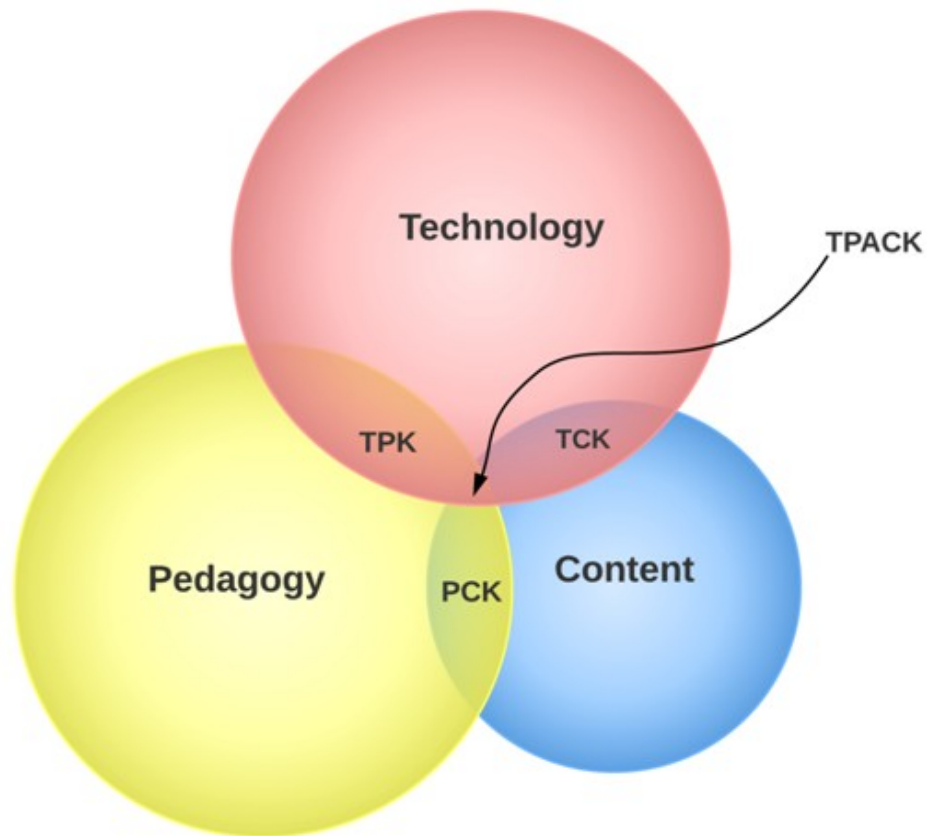

Figure 15. Aubrey's TPACK Survey Representation

education program has caused her to think more deeply about how technology could influence the teaching approaches she uses in her classroom. She continues to think critically about the use of technology in the classroom, how she selects technologies that enhance what she teaches, how she teaches, and what students learn.

Audrey's self-assessment suggested that she has insufficient knowledge about mathematics or the sciences. She does not possess a mathematical or scientific way of thinking, or possess the strategies to develop a deeper understanding of mathematics or science. Aubrey

has expressed a lack of knowledge and ability to use technologies and instructional pedagogy in the areas of mathematics and science.

Audrey is hesitant in her ability to provide leadership in helping others to coordinate the use of content technologies, and teaching approaches at Harper Middle School or her district. When responding about her co-workers Aubrey reported that her co-workers in science, mathematics, and literacy appropriately combine content, technologies, and teaching approaches in their lessons. She did not report the same from her co-workers in social studies.

Based upon the self-assessment of technical and instructional skills, Aubrey has identified strengths in the area of technology and pedagogy in the history and literary content areas. Her observations of peers in mathematical, literary and science domains have reinforced the appropriate integration of technology, pedagogy, and content knowledge.

Sunshine's TPACK Survey. In a self-assessment of technology and instructional skills represented in Figure 16, Sunshine expressed the ability to learn technology easily, solve her own technology problems, and use technology skills to implement technology in the classroom. Sunshine also expressed belief in her ability to teach lessons that appropriately combine mathematical, science, technologies, and teaching approaches. She is able to use a mathematical or scientific way of thinking and employs various teaching approaches to guide student thinking in the areas of math and science. Sunshine expressed confidence in her ability to teach lessons that appropriately combine literary, history, technologies, and teaching approaches. She is able to use a literary or historical way of thinking and employs various teaching approaches to guide student thinking in the areas of literacy and history. She has the ability to assess student
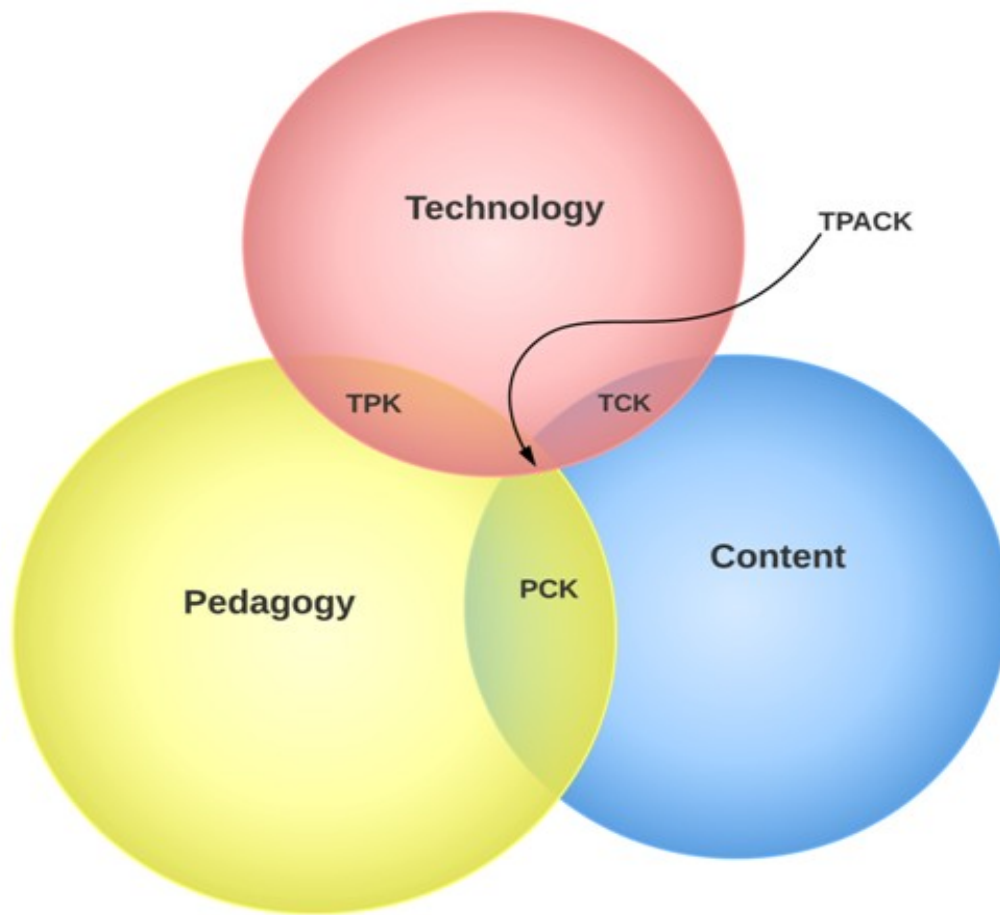
Figure 16. Sunshine's TPACK Survey Representation

performance, and adapt instruction based on students' needs and learning styles. She is able to

assess learning in many ways, use a wide range of teaching approaches in a classroom setting,

and identify common misunderstandings and misconceptions, as well as organize and manage

her classroom well.

Sunshine stated that she has confidence in her ability to choose technologies that will

enhance the teaching approach and student learning while delivering a lesson. She agreed that

her teacher education program has caused her to think more deeply about how technology could

influence the teaching approaches she uses in her classroom. She continues to think critically

about the use of technology in the classroom, how she selects technologies that enhance what she teaches, how she teaches, and what students learn.

While Sunshine's area of certification is in English Language Arts and Reading, her self-assessment suggested that she has moderate knowledge about mathematics or the sciences. She expressed the ability to think in a mathematical or scientific way, and her assessment indicated that she possesses the strategies necessary to develop a deep understanding of mathematics or science. Sunshine has expressed having moderate knowledge and ability to use technologies and instructional pedagogy in the areas of mathematics and science. Sunshine offered a neutral response regarding her knowledge about different technologies, selecting teaching approaches to guide student thinking about mathematics and science.

Sunshine assessed her ability to provide leadership, to coordinate the integration of content, technology, and teaching approaches at Harper Middle School or her district in a neutral manner. When responding about her co-workers, Sunshine reported that her co-workers in science, mathematics, social studies, and literacy appropriately combine content, technologies, and teaching approaches in their lessons.

Based on the self-assessment of technical and instructional skills, Sunshine identified strengths in the area of technology and pedagogy in literary content areas. While English and Language Arts is her strength, she also expressed abilities in content and instructional strategies for mathematics, social studies, and science. Her observations of peers in the mathematical, mathematical, literary, social studies, and science domains have reinforced the appropriate integration of technology, pedagogy, and content knowledge in these areas.

The results of the TPACK surveys are helpful in the analysis of the participant's experiences in their roles as a classroom teacher, co-teacher and instructional support to others.

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These results are discussed later in chapter 5 in connection to the success and challenges faced by the participants as they implemented digital text in the inclusive classroom. In the next section I explore the culture of Harper Middle School, in regards to digital text, and the campus' history of negotiating the implementation of digital text in the inclusive classroom.

Going Digital: That's Who We Are

Early in the semester, just after I had sent out participant solicitation letters, I visited the Harper campus. I had stopped by Lois' classroom to speak with her regarding a student who would be transitioning to high school next year. While I was with Lois, Aubrey walked into the classroom to speak to Lois. After Aubrey's conversation with Lois, I asked her if she had received my email regarding this research. Her eyes lit up, brows rose and as she spoke, her smile filled her whole face. Audrey replied, "Yes! Sunshine was supposed to email you…Oh my! I got the email and I showed it to her and said "We've got to do this! That's who we are!" She held her hands out as if she was holding the email and shaking it at Sunshine. Aubrey had just spoken a credo for Harper Middle School. As if her words were for everyone not just herself, "It is what *we* do", not what she did or what she was planning. No, this was an identity for the Harper campus. An identity she had grown into, an identity she was happy to express in front of Lois, indicating a shared and acceptable position.

There is an unwritten expectation that is inherent to the Harper campus. It is not in any job description or list of roles and responsibilities. It is not necessarily disclosed within the settings of a job interview. Special education resource teachers, co-teaching teams, and general education teachers are expected to implement accessible digital text as needed per the Admission, Review, and Dismissal (ARD) team on campus. This is not simply providing a recording of a text, modified assignments, or an alternative assignment. Teachers are expected

to provide digitally accessible formats of all classroom instructional materials. This includes worksheets, workbooks, PowerPoint, photographs, whatever is used for the general education students must be made accessible to the special education students. The expectation, the culture of digital text, has become an identity for Harper Middle School teachers. The next section describes the journey of Harper Middle school to develop the identity of being a learning environment that is accessible to all special education students in an equitable manner.

The Early Years

It was approximately three years ago that the Harper campus had its first experience with digital text. During the 2009-2010 school year Lois, Elia, and Sunshine attended training on new software the district had purchased to support the implementation of digital text. The software offered text to speech, a talking word processor, and writing support to students with reading disabilities. Shortly after these first trainings, Harper began to implement digital text in a classroom. Recollect, in this study the title *co-teaching* is used by the participants to describe the role or title of an *in-class support* teacher. Lois recalled their first steps towards implementation.

> We did not implement it strongly on our campus as far as mainstreaming. We did
> implement it in a reading, writing class. That is a general education class because that is
> where most of our students in the 7th grade receive a co-teach class and they receive
> special education services. So we used it in a co-teach instruction class as well as in the
> resource reading class. We did not implement it in a science class, history classes at that
> time, or math classes.

Sunshine and Elia were the teachers for the co-teaching class and Elia was the teacher for the resource classroom. Although they had selected one co-teaching classroom, the main focus was upon the resource language arts class that Elia taught. It was in her resource classroom that Elia

was able to work with the software's supporting resources, such as Bookshare.org, and continued to learn. Elia commented,

>That was my first experience with that and you know, with the -- what is it, bookshare.org and setting up the accounts and you know, setting up requests to add a student to be able to utilize it and then try to get the software. I had some issues with the software. I had some difficulties that first year which is learning it and I went to the training I think at least two times if not three and I still did not have a good grasp on it. And that was kind of the middle of the year. We had a lot of struggles implementing that in the classroom, say if the child was in a co-teaching language arts or just a regular language arts if he had that mod- -or he or she had that modification, we struggled with getting the software into the classrooms where the students were. We struggled with trying to show the teachers what it was and how it worked because I did not feel very confident in my knowledge of it. That first year was really hard.

The transition was not easy for Elia as she struggled to learn the new software and supporting resources like Bookshare. For Elia, multiple trainings were required and additional support from her district was provided. Lois provided support for Elia and Sunshine while looking to improve the campus implementation.

Aside: I was the central office representative that set up the professional developments that Elia attended. I was a facilitator and attended most of the trainings. I made follow-up visits to teachers' classrooms to assist in any way possible. I was able to visit Elia's classroom and escort the software representative to help her through the initial struggles. I was not her only support, Lois explained,

There were some obstacles, technical obstacles that teachers kept running into, so we

would use it, but it didn't run or flow nicely. So I had also attended a training that year,

so those three teachers and myself would work out those kind of kinks.

Harper Middle School implemented digital text in what Lois refers to as the *school component* in

the co-teaching classroom during the first year. The *school component* involves providing digital

text in a format that is accessible for all materials a student may need to use, not only the

textbook. This process required Lois and Elia to convert inaccessible files that teachers had

prepared as handouts or assignments, into the appropriate formats so that the software would

recognize and be able to read the text. Through this experience Lois reported,

When we did implement it in that one class, we foresaw that there was a need to do a lot

of pre-planning because when you do convert files and you want the student to be able to

use the software and it be to their best benefit, a lot of things didn't convert accurately so

we had to really proofread what we needed and then work out kinks that way.

Looking back at the first year Lois and Elia recalled the struggles they encountered and spoke of

them as if they were wounds from a well fought battle. The pride in their accomplishments is

evident in how they spoke of their experiences. Elia shared:

I would have to say this past year, actually, probably the second half of the last school

year really was a lot easier and a lot clearer and the students had the expectations of what

they were supposed to do and how to use it. So I became more fluent with it, I guess, for

lack of a better term, and doing what I was able to set the kids up on it where they knew,

you know, and then by the time it was time to take their writing TAKS they knew exactly

 what to do. Or you know any kind of paper, whatever. It wasn't an issue, it wasn't a

hassle.

Elia describes a difficult period in terms of integrating accessible technology within the mandates of several laws and policies. Yet she was persistent, had the tenacity to become proficient and was able to develop the skills needed to provide the campus a strong foundation for future growth.

Administrative Support and Apprehensions

Harper's implementation of digital text in their special education and co-teaching classrooms began with Lois and Elia's early vision. However, the approval and ongoing support from campus administration had always been there. Lois was happy to confirm that "both administrators are on board 100%" and that their support has "been there from day one". Administrators have communicated that resistance to implementing digital text is "non-negotiable" on the Harper campus, supporting Lois and Elia's efforts. Support has also come in the form of access to software that converts documents into files that are accessible through the text-to-speech software. The implementation of digital text and the increasing integration into teacher's lessons would not be possible without the support of the campus administrators.

While supporting the implementation, campus administrators also expressed concerns and fears regarding the use of digital text. The students on the Harper Middle School campus did not move up from elementary school with digital text as an instructional support noted in their records. The identification of students was on the shoulders of the Harper campus. Lois recalls the process of identifying students for this accommodation would often result in conversations spurred on by these fears.

When we first started implementing it through special ed. services, there was a lot of conversation between myself and the principal on who should have access to it. And in that conversation, reading levels are generally brought up. What's the student's reading

level opposed to what's the student's identified disability. There's a fear that if a student gets too reliant on it then they're not going to grow in their own personal reading skills. Fear of stifling the growth of students, giving too much support, and keeping the student from learning to read challenged administration's support of digital text. Allowable accommodations on state assessments were also a concern. To what extent can text-to-speech be used? Can they be successful without it on the test? There are many questions that can cause fear and apprehension for administrators. However, through it all Lois expressed gratitude for the continued support for the implementation and integration of digital text for students who qualify and require this support.

Redesigning Implementation

The Harper Middle School continued through their third year of using digital text in the resource classrooms and in selected co-teaching classes much as they had at the end of the second year. Moving into the 2012-2013 school year a noticeable change occurred. During this year Elia changed positions. She was no longer the resource language arts and co-teacher for language arts. She moved into the role of the Instructional Teacher Advisor and Aubrey was hired in the resource language arts and co-teaching position. Toward the end of the 2011-2013 school year, Lois' motivation for implementing accessible technology also changed.

> Well, the motivation is, truthfully … we had a student here a few years back. Two years back, actually, that I saw where digital text was his key to success. Let's work with him or let's figure it out ourselves because he's going to be going to high school soon and they don't have a small campus, like we do, that is going to be able to recognize he's got the strength to be productive if we can just take down that barrier of him not being able to read. And so, he has two younger siblings, so I still see his mother. So talking to

her, he had a really rough 9th grade year -extremely rough. She would also ask me for

some recommendations. You know, what should I do here, what should I do there? I

said, you need to make sure he uses the digital text in the classroom So talking to his

mother, she would tell me things that were happening and I said, well, is he using the

software? No, they don't use it there. I said, well, they do use it there. I said we need to

get it implemented in the classroom. Make sure that it's set up on the classroom. She

actually made sure that he had the software in every one of his classrooms and he can

access it. So then it started dawning on me, this is just not a three-year thing on our

campus. We really need to teach these kids not only how to access it, not only how to

use it, but use it as their personal resource and then how to ask for it when they move up.

Aside: As Lois recalled the motivation I got chills down my arms and back. I knew of

this student because, I had been called to the high school over this same situation. This is the

student I have written about in chapter three as part of my subjectivity statement.

This new motivation along with changes in campus staff activated a passion and drive in

Lois. This passion and drive moved into a transformation in Harper's implementation of digital

text. Lois continued,

So that's where this year at our campus I kind of just said, you know what? We're just

going to do everything we possibly can to implement it into every accepting classroom

that's going to allow it. And then if, when I review failures, if I see students that should

be using it and it's not being used, I'm going to go and try to work with that teacher. I'm

going to show them, maybe they're too busy to ask me, you know? I really don't know

how to get this done.

Doing everything possible to implement digital text involved working with the district technology office to make sure every computer on campus had the software installed. Lois went to every classroom on the Harper campus and documented the needed identification information from each computer, communicated with teachers, and ensured that students would have access to the software they needed. Data systems were developed so that students would be able to access a special folder on the campus network to find files needed for class. The students were able to go to any computer on campus and open an assignment as an accessible file to use with the software. As an added support, the Harper campus created a room for academic support "Harpers Ferry" for all students. Lois describes the use of this support.

> All of our students that are really, really low in reading, we make sure that they have
> headphones or earplugs, so they can easily access it. We have Harpers Ferry that we use
> this year in teaching them how to use it and become more independent with it. If they
> don't want to use it in the classroom they can come to Harpers Ferry and use it over here.

When the Harper campus ran into an obstacle in terms integrating digital text, they found a way to solve it instead of surrendering to the challenges. The increased drive and motivation also affected teachers' roles and expectations. With the accommodation of digital text added to many students' IEP requirements, the classroom teachers began to take a more active role in the use of digital text in the inclusive classroom. Elia spoke of the change,

> There were a lot more requirements put on our teachers this year just because, if we
> required them to do this by a certain date then we could guarantee or you know, Lois
> could guarantee that these kids would have the services as they should.

Elia's new position coupled with Lois' drive and the support from administration allowed for additional requirements to be added to teachers' responsibilities and an increase in professional

development training. Elia describes the support structure for both teachers and students that

provided the foundation for Harper's vision to move forward.

So part of what was implemented this year, and I did staff development on this, too, just

to show them, you know, it's not that hard. And I'll do it with you. So what Lois set up

and what we had going on was, any assignment that a student was going to have and they

were going have to use any part of that system, and all these kids were SPED. Any

assignment was supposed to be sent like a week in advance. Or they could come to my

room and scan it; we could also scan it through the office with our assistant principal.

Part of the transition into the 2012-2013 school year included new staff. Aubrey was

hired at Harper Middle School in September, four weeks after the school year started.

Lois and Elia had created a system for implementation and Aubrey was about to embark

upon a new adventure. Lois spoke of her hopes for Aubrey,

We have a new resource teacher. Getting her to training, kind of allowing her the

opportunity to see the value of this software in the classroom…We're relentless this year.

Lois' vision for the implementation of digital text at Harper Middle School had grown into an

identity. This identity had been taken on by Lois, Elia, and Sunshine. It has now become

Aubrey's time to be exposed to this belief system, time to learn, find value and put her voice into

the identity of a Harper Middle School special educator. In the next section I discuss the

thematic findings for Aubrey's journey.

Aubrey: Keys to Finding My Voice

Aubrey is one of the direct participants in this study. Her experiences as a first year in-

class support teacher, supporting digital text in an inclusive classroom is the focus of this case

study. When I met with Aubrey in a member check meeting, after all the data was analyzed,

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coded, categorized, and themes recognized, I asked her if she would help me by offering a title

to her story. I asked her to write a title as if this would become her own Hollywood movie. She

pondered the idea for a couple of days. Finally I received an email stating that she had indeed

thought of a title, or four titles. She was not able to make a final pick. I glanced through the

choices and picked out "Keys to Finding My Voice," the only one that spoke to the entirety of

her case. Aubrey had indeed participated in a journey that gave her new insight to her teaching

and her purpose as a teacher. Through this case, Aubrey's roles and responsibilities, her

experiences in redefining her role, and the discoveries she uncovered in her journey to find her

voice are discussed.

As stated earlier in this section, Aubrey is fairly new to education. Coming into this

school year Aubrey was only able to base her expectations of her roles on the previous

observations she had made during her first year. This section reflects the themes developed from

the experiences Aubrey encountered as she began her role as a co-teacher/ resource teacher at

Harper Middle school. Three themes were identified through data analysis. They include: (a)

Finding Value in Assistive Technology: Aubrey's Voice; (b) It's All in How You Save It:

Moving Toward UDL; (c) Don't Call Me Special: The Challenges of Implementing

Accommodations. Through these themes I provide an understanding of the participant's

experiences, struggles, and successes as she integrates digital text in the inclusive classroom.

Finding Value in Assistive Technology: Aubrey's Journey

The 2012-2013 school began with the anticipation of new beginnings for Aubrey. I recall

the first time I saw Aubrey on campus that school year. I had directly worked with Aubrey

during her previous time at Harper, however I was unaware she had returned. She greeted me

with a smile and a jump in her step as she came toward me to express her excitement about being

back teaching at Harper again. As we met for the last interview in this study we spoke in more detail about her year and her experiences.

For this interview I asked Aubrey to create a timeline drawing of her year at Harper Middle School with the task of implementing digital text in the classroom as the focus. Aubrey created a graphic representation of a timeline as a visual prompt for an interview.

Aubrey chose to represent her year in a bar graph representing the percentage of technology, specifically text- to-speech, for the percentage of technology integrated and an emotional ranking

Figure 17.   Aubrey's graphical representation timeline

for each month of the year (Figure 17). The last part of the timeline is her projection of technology usage for the next school year. After Aubrey finished drawing her timeline, I asked her to elaborate on the meanings she assigned for the percentage of technology integrated and an emotional ranking for each month of this year. Focusing on each month Aubrey described her year.

September is when I first came in. I had all of my lesson plans that I had prepared just kind of in the beginning, for the beginning part and a lot of them had technology but not a

lot because I didn't know what I would have access to, didn't know what the students would have access to.

It was mid-September, the year had already started. Excited and full of energy Aubrey began her year at Harper Middle School. She was not new to Harper, however, her position and role was different from her previous experiences. As Figure 18 shows Aubrey was happy. "I just started. I didn't know anything". She had come back after some time away to start a family and was looking forward to the year. No concerns or stress, just minor anticipation of the year ahead.
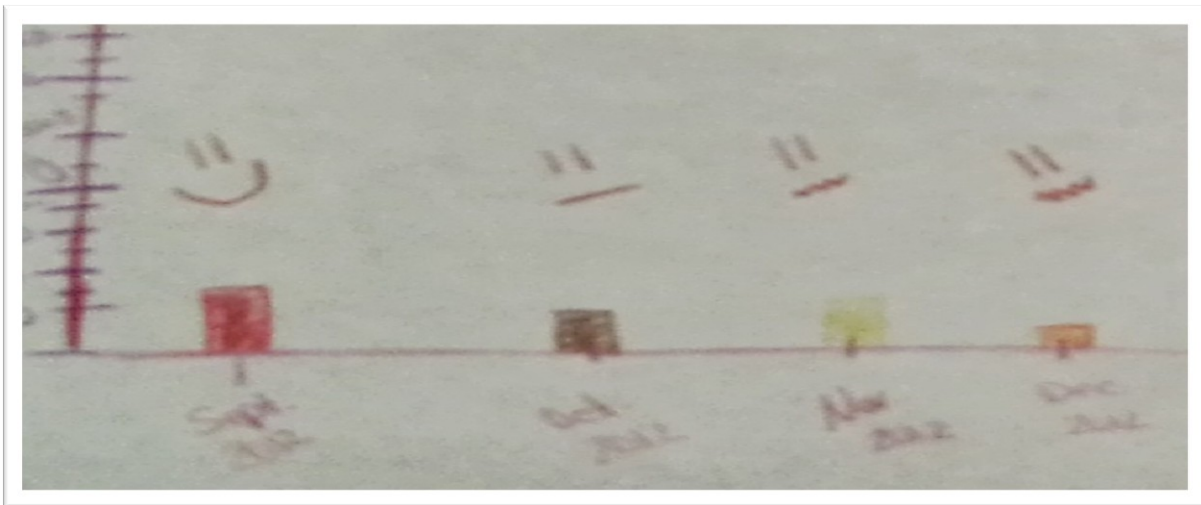
Figure 18. Aubrey's timeline September through December 2012

In her previous experience she was a teacher in a self-contained classroom and served as in-class support for electives only, providing assistance to the students from her classroom. She did not work with the majority of the special education population at the time. She knew of her class and the technologies she had available then. Arriving on campus after school had started and taking the position of a teacher who was still on campus was difficult. Some may expect the new teacher to take off just where the previous teacher left off. Aubrey made plans for what she assumed would be her assignment on campus. Taking the time and effort to make this position one's own takes time, time that had already been diminished by the late start of the school year.

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Aubrey had prepared for what she had known from observations during her previous experience at Harper. She knew of Elia's previous role on campus and prepared what she felt would be needed based upon those observations.

The next three months went by with little change in the amount of technology Aubrey used in her daily lessons or co-teaching classrooms. However, the happy feelings she had at the beginning of the school year had gone. She had her schedule, resource classes, and co-teaching in English language arts for sixth, seventh, and eighth grades. However, when October arrived her experience changed.

I didn't know my weight load or what was going to be dropped on me yet [in September] and then in October I think I was just so-so because it started kind of sinking in that more was coming to my plate than I had projected.

The schedule Aubrey had become comfortable with had changed. No longer would she be teaching resource language arts and co-teaching in English. She now had the added duty of co-teaching in science and history as well. As shown in her schedule, in Table 2, the classes that had exclusively been a co-teach language arts class now shared the same class period with science or history. This resulted in Aubrey giving support to the science or history class for approximately 15 minutes each and the remainder of time giving support to language arts.

On Mondays and Wednesdays Aubrey would visit three classes in one class period throughout the day. During these days it was common for Aubrey to keep her backpack on as she would be leaving soon to another class. She was given an additional preparation period on Tuesdays, Thursdays, and Fridays so that she could support the digital text needs of students in the inclusion classes. Aubrey was unfamiliar with the use of digital text, text-to-speech, or any

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technological writing supports. She admits her department chair, Lois, had been asking her if she had used the software with the students. However, Aubrey was not ready to look into a

Table 2
Aubrey's schedule starting in October 2012

	Monday	Tuesday	Wednesday	Thursday	Friday
1st	Prep/LA History History	Prep/LA History	Prep/LA History History	Prep/LA History	Prep/LA
2nd	LA 8th Science 7th Science 8th	LA 8th	LA 8th Science 7th Science 8th	LA 8th	LA 8th
3rd	Planning	Planning	Planning	Planning	Planning
4th	Resource LA	Resource LA	Resource LA	Resource LA	Resource LA
5th	LA 7th History	LA 7th Science 8th	LA 7th History	LA 7th Science 8th	LA 7th
6th	Reading 6th History	Reading 6th	Reading 6th History	Reading6th	Reading 6th
7th	History Science 6th History	Prep.	History Science 6th History	Prep.	Prep.

new technology at this time as she was feeling overwhelmed with the recent change.

Aubrey: I was just mad in November and December. And when I say mad I don't mean…I was frustrated, like I was hitting a wall and I was given this stuff but I didn't have the support to go with it and I needed the support.

Debra: In what areas did you feel you needed support?

Aubrey: With taking on co-teaching three different subjects, support bringing in the text-to-speech and writing software. I had my person telling me, you know, you want, but I know we never actually had time to coordinate because we were both so busy. I was taking on three subjects of co-teaching so it was frustrating at that point and I felt like I could have used more help.

Aubrey's ideas and expectations about her role at Harper had challenged. Just as she had started feeling like she had a handle on her school routine, the game was changed. Not only was she responsible for supporting three subjects, she was still teaching her resource language arts class, and being asked to learn new software. She felt like she was carrying a large load and was at the end of her path with nowhere else to turn. Aubrey wanted support, but the pressure she felt was not exclusive to her experience. Everyone at Harper was feeling the strain of more to do and without additional time. Aubrey looked for support from her department chairperson, but when that support was not available, she looked inward and decided to live with it. She continued her story about her timeline in January (Figure 19),

But then in January, I was OK with it. I was like, I think I just dealt with it and realized if you're going to do anything, the only person who's going to help you is yourself, and there are people out there to help but you have to approach it, initiate it and go get it.
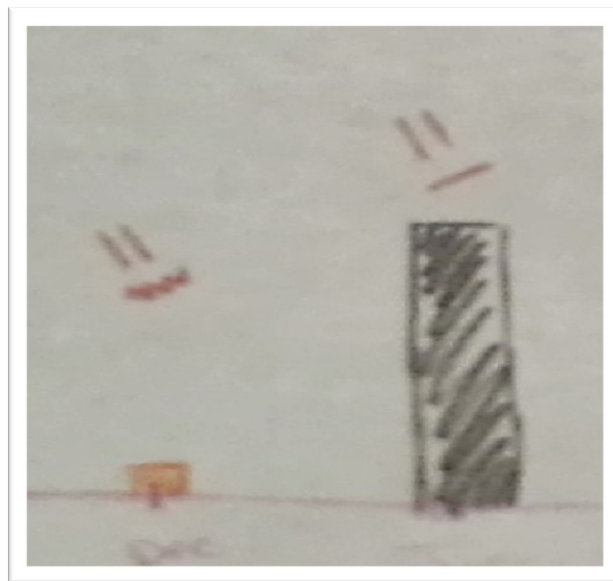

Figure 19. Aubrey's timeline December 2012 through January

stronger drive. She knew she had people who could support her, however she knew these people

were busy as well and she didn't want to bother anyone because she "couldn't blame them" after all. I would hear many times during this study, "I can't blame them," as Aubrey would state this each time she felt she was about to complain, critique someone's actions or beliefs. She knew she had a rough schedule and position within the campus. However, she was not the only one struggling and expressed empathy for others in similar positions. While she did not always agree with what a teacher chose to do, speak, or implement, she would often excuse them by stating, "I can't blame them." In Aubrey's eyes her struggle was no worse than anyone else's, so she looked to herself to take the next step to move herself forward. This was her schedule and she would need to figure it out on her own. The expectations of the campus lingered in her mind as she decided her next step.

An expectation of the campus was for her to learn the text-to-speech software, however, due to her late arrival on campus and the changes to her schedule, Aubrey had yet to try it out. She had been looking for support and no one had the time to tell her or show her the software or what it could do for the students. Aubrey described her conversations with Lois:

Lois came to me and said, "We've got a new program out. It is an awesome digital text-to-speech type thing. We'd love for you to check it out", I was like, OK, we'll check it out, and I was kind of getting in the groove, trying to come in. I did come in late in that semester so I'm just trying to get into the groove by my supplies, my scope and sequence, do my lesson plans, and then it was kind of like she kept coming back to me. "Well, are you using this with them?" Or have we used -- and it was a continual, I don't want to say nagging but it was almost like my mom continuing to say, I brought you that toothbrush, have you used it? You know, have you used it yet? Have you used it yet? So when I say pushed down my throat, just constant, a reminder of it, like hey, we've got text-to-speech,

are we using it? Hey, we've got this. Have you done a short lesson on it or maybe can

we do it this way. So a lot of suggestions coming my way to where I think with the grind

of everything else I was like, ahh, I don't have time for one more thing.

Aubrey had heard Lois, however, the activities associated with getting ready to teach and trying

to figure out her schedule prevented Aubrey from learning the text-to-speech software. She was

looking for support and came to the realization that it was easier to rely on herself to find the

support, to seek assistance or learn on her own. As found in archival documents, Aubrey was

aware of the use of the software by students and other staff. While Aubrey had not yet

participated in the training, she was well aware what was involved. Lois continued to question

Aubrey on her usage of text-to-speech software. This persistence eventually paid off. Aubrey

stated:

> Finally, I was like, OK, you know what? I'm going to sign up. It was suggested to sign
>
> up for the training which I think that's where I said it felt like I was -- I wanted to take
>
> the trainings so people would stop asking me a lot about it and I feel horrible saying but I
>
> was like, maybe they'll stop and then maybe I'll learn something, maybe I won't.

Aubrey had signed up for training in February. Her motivation was to attend and then report

back to her campus that she had finally completed training. That way they would leave her alone

and let her get on with figuring out how to manage her schedule. She did not want one more

thing to be added to her plate. She wanted the nagging to go away. Aubrey described her

experience with this training in her timeline drawing (Figure 20):

> And then in January, February, March and April they spike because I was able to go to
>
> this fantastic training and get help on exactly how to utilize it and what to utilize it with.
>
> So I used it a lot more and I think I'd gotten used to my hectic schedule by this point
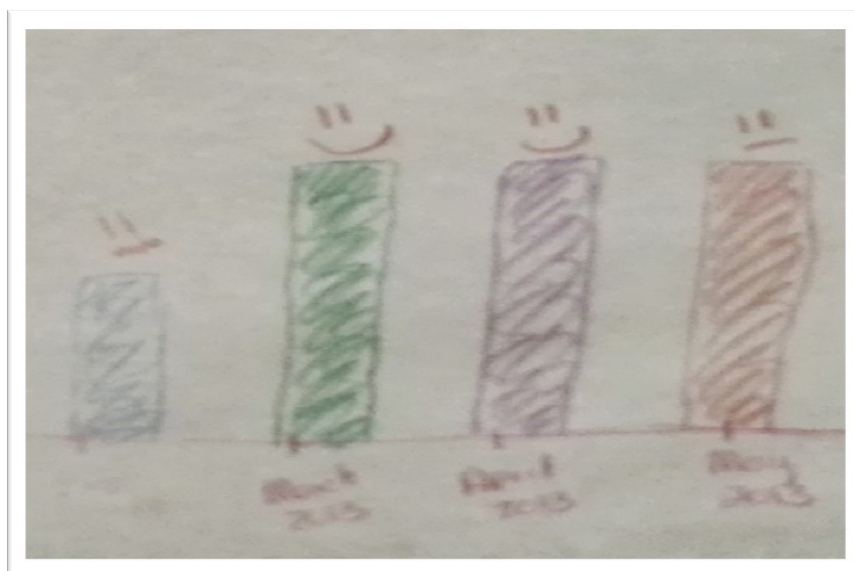
Figure 20. Aubrey's timeline February through May 2013

Aubrey attended the training and loved it. She finally got it! She knew the reason Lois had been asking her if she had used it. "Now I get why you were asking so much!" Aubrey exclaimed to Lois. Aubrey finally understood what she had been missing. She had resisted for so long, fearing it would be "just one more thing to do", and after going to training she finally "got on it and learned so much". The campus had made the expectation clear. Aubrey will use digital text, as in text-to-speech, and writing supports in their inclusive classrooms. Aubrey was now ready to comply.

Aside: The training Aubrey spoke of was a training given by the district's special education instructional support office. This training was not on the original professional development plan for the school year. It had only been added a few weeks prior due to a need for the software on a couple of high school campuses. This training was the only professional development session for text-to-speech software that I presented during the 2012-2013 school year. All other trainings were presented by other curriculum specialists in the district. At the

time of the training, Aubrey had not been approached, recruited, or considered as a participant in this research.

Aubrey returned to campus with a new energy and excitement. Reflecting on this moment, Aubrey stated:

> I think this is what teaching is all about. We will build on our mistakes and we will build on what we do well. I know the things I did well and I will build upon them…let's go, game face on!

With the support of Lois and her administration, Aubrey implemented the additional accommodation of digital text in her resource and inclusion classrooms. Aubrey spoke with pride as she described how students had become independent in using the software. Each time an assignment was given, as the class would break into silent reading groups, they would get up and go to the computers, put on their headphones, and begin using the digital text. It was through this accommodation that Aubrey experienced her students staying current with assignments, and accessing the curriculum in the general education setting. Aubrey looked to the future and her continued support of students with disabilities.

I asked Aubrey to think about 2012-2013 school year, and about how she started in relationship to where she was in May. Aubrey paused, and responded with a soft "Wow!" Continuing, she stated how she was not prepared in the beginning, but exclaimed about how far she had come. Aubrey had completed a journey beginning by using older technologies to having her eyes opened to a new technology which changed her way of teaching. She said she looks forward to using all her new technology and showing other teachers how to implement technology. As we concluded our discussion, Aubrey smiled, shook her head up and down, and exclaimed, "I'm very proud of my progress."

The culture and support of the Harper campus was the catalyst Aubrey needed to begin her journey. Without the unwritten expectation continuously expressed, Aubrey may never have been introduced to the use of digital text and the software that facilitated this accommodation. If it had been solely up to Aubrey to implement this accommodation, it would have been delayed or never begun. In the next thematic description I will continue to look at Aubrey's journey of implementing digital text and the support that this accommodation and instructional strategy demands.

It's All in How You Save It: Moving Toward UDL

Harper's delivery model for digital text had been set up at the beginning of the school year and was implemented through the campus computers in each classroom. All computers had previously been installed with the text-to-speech software. Each inclusion class or any class where the accommodation would be implemented was assigned a folder on the campus *all* drive. This drive was accessible for all students and staff. Not all digital files were accessible for the text-to-speech software the student would be using. If a teacher had an assignment that needed to be made accessible, the assignment was sent to Lois or Aubrey to be converted to the appropriate file format and saved in the class folder for the student to access. When an assignment was given to the students who have this accommodation, they were able to use the computer in the classroom to log in, open the text-to-speech software, and import their assignments through the "all" drive. As students began to break into small groups for individual reading, Aubrey would approach them and ask "Would you like to use the computer? We have it orally where you can listen to it". Some students would say "yes" and some would decline the accommodation. Hesitant to embarrass or identify the students as disabled, Aubrey would not force a student to

use text-to-speech software in the general education classroom. She gave the students a choice in using the software. Aubrey recalls this process toward the middle of the semester,

> *Now* [emphasized], because it has become part of the routine. So they already know automatically, our guys know who is able to use the computer, they don't say anything they stand up and walk to the back of the room, put on their headphones, and start using the computer. And it has become routine now.

This routine allowed students who need the support of digital text to maintain their presence in the general education classroom. However, without Aubrey's efforts to make the files accessible, this accommodation would be unavailable.

Beginning this new adventure was not easy for Aubrey. She started with excitement and soon was met with the reality of implementing an accommodation that was not accepted by all her colleagues. In Aubrey's timeline drawing she indicated an increase in her usage of digital text and technology in January through May. During this time she also indicated decreased satisfaction in the implementation (see Figure 20). Aubrey experienced frustration and at times anger in her attempts to implement digital text. She had become frustrated with the continual push of a software program and accommodation that most of her teachers would not use. Her new schedule included supporting three science, two history, and two language arts teachers. During a typical week Aubrey spent a full planning period working on the process of converting inaccessible files to accessible files for these teachers. She was frustrated with pushing the technology and having to do all the legwork for the software as well. Aubrey was referring to getting the work, converting files, re-emailing the file, resending it, and re-doing all of this in order to make instruction accessible for students. Aubrey struggled through February and then became used to her role and made the best of it.

I was trying to make it through and just did what I could for my kids that I worked with

and did, in my room for the resource, and also for the co-teaching, I did what I needed for

those guys and I just concentrated on them.

The struggle of her schedule and providing accessible text had not gone away; she had just

conceded that this was her plight, her sacrifice, in order to make the classroom accessible for her

students.

Aubrey had hoped she would find a better way to provide accessible materials. The

process of receiving, converting, and uploading files to the campus *all* drive was not as simple as

Aubrey hoped it would be. The hope she had felt, after attending the training for the software,

was soon diminished. Aubrey expresses her frustration in February (Figure 19):

In February I was kind of mad about it all. I was not mad about, but frustrated and I keep

saying mad but I wasn't mad. I was upset and frustrated that I was continuing to push a

program that most of my teachers (beside science and me) was going to continue to push

this technology program. I had to do all the legwork for it, meaning get the work, convert

it, re-email it, re-send it, re-do all of this. Like, I had to do it all in order to get it

accessible.

The reality of retrofitting a curriculum to meet the accessibility needs of students is time

consuming and frustrating at times. For a typical lesson Aubrey would download the textbook or

any book they were using from Bookshare. The book file was then saved to the class file on *the*

all drive. For other materials such as worksheets and items that the teacher did not have in an

electronic copy of Aubrey would need to scan and retype the file completely. The process the

campus would take to convert a file is detailed in Figure 21. The classroom teacher sends any

files or document that needed to be converted and added to the class's folder on the campus

drive. Before Aubrey added the file, she would first check to see if it was already accessible. To

be accessible the file must be saved in a PDF, RTF, XML, HTML or Daisy (OPF) format. If the

file was accessible, Aubrey would proofread the file and after she determined it was accurate,
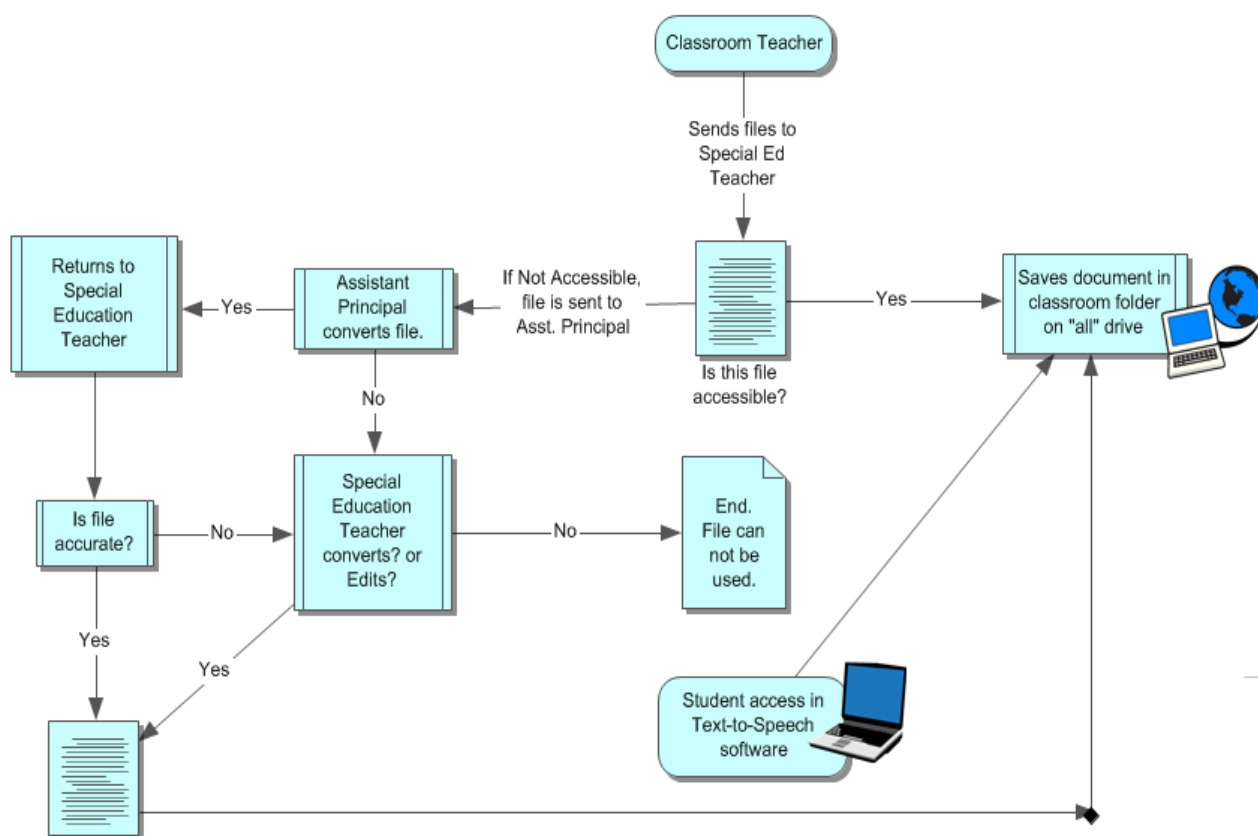

Figure 21.   File conversion process for Harper Middle School.

she saved the document in the students' file or classroom folder on the *all* drive. However, if the

file was not in an accessible format when received from the classroom teacher, Aubrey converted

the file to an accessible format before she could provide it to a student. This step had varying

degrees of difficulty depending on the original format of the document. Files that were saved as

a .doc or .docx file would be saved as a PDF, RTF, or Daisy format depending on the preferences

of the students. Files that are locked PDF's or formatted as a picture required a more complex

process of conversion. These files Aubrey had to send to her campus Assistance Principal (AP) for conversion. At this step the file was scanned and saved as a Word document. The AP then sent the file back to Aubrey to proofread and edit any irregularities, saved it as a RTF, and then saved it again into the classroom file. If the document could not be converted successfully it was sent back to Aubrey. The only other option available at this point was to type the document from scratch. Depending on the priority of the document the files may or may not have been re-typed. The process of getting the work, converting it, re-emailing it, re-sending it, re-doing all of this strained Aubrey's drive and passion for teaching. Despite her frustration, Aubrey continued to look for a better way for the process to flow.

The difficulty in this process of file conversion created two areas of frustration for Aubrey. The first was that the campus AP was the only person who had access to the conversion software. Aubrey explained:

> A big problem that I had goes back to only the assistant principal having that program to convert the documents. Because it took a long time, if he was not able to help us, for us to try this program or this thing we found on the web, and I think on a campus more than one person needs the rights to that kind of software because that just defeats the whole purpose.

It was unknown to Aubrey what the software was or if it was a program the campus owned or a personal program belonging to the assistant principal. If the AP was away from his/her desk or off campus then Aubrey was not able to access the software or have the AP convert it for her. To help with the delays, Aubrey would try out other options such as free conversion applications or websites. Using free conversion sites had their issues as well. This was evident in Aubrey's journal entry from May 2, 2013:

Lots of converting today used the online conversion website. So I scanned, emailed,

converted...UGH! I am done with the non-electronic versions of worksheets. Would

love for teachers to start using the text-to-speech and writing supports more.

The selective availability of the AP and unreliability of online, free conversion tools had become

one of the top frustrations for Aubrey.

Teachers,

Working with each of you to service our students is exciting for me in my teaching career. Together through collaboration and communication our students will benefit in academics, relationships and behavior. I understand the newness of co-teaching for me and for some of you, so please contact me with all your ideas, strategies and any concerns for that matter as I will with each of you.

In the effort to support student modification in the mainstream classroom, assignments need to be with me **at the latest one week prior to instruction**. There are multiple ways this can be accomplished so I will offer a few and please **choose the best fit for your classroom**.

1. Place the assignment and lesson plan in my box on Mondays one week prior to instruction. Preferably **two weeks** so pre-teach is an option for the modified students and other students at risk.
2. Add me to your lesson plans in   with the **daily assignment as an attachment** for my review and modification for student.
3. Add me to your   and attach the daily assignment to   and send me the lesson plans through email.

Please email me how you will be providing me with your lessons and assignments so I can place this information in my binder. I am working with several teachers; therefore organization and time management is essential for me to be an effective support for students in the classroom.

Thanks for all your support in my position,

Figure 22. Email to Harper staff from Aubrey. Identifying information, which appear as white spaces, has been altered to maintain confidentiality.

The second area of frustration was the timely delivery of materials that needed to be

converted or modified. Aubrey sent out an email to the entire Harper staff in the fall and again in

January asking for all files to be sent to her one week in advance (Figure 21). The reality was

that teachers did not send documents in a timely manner. Some teachers had been known to send

the file the day before they needed it or not at all. As observed in the archival documents

collected from Aubrey, most notices from teachers were one to two days in advance. The

content area teachers who requested Aubrey's services the most were those who taught science.

When teachers delayed in sending assignments for conversion, Aubrey would be forced to

reschedule the time she had planned to work with students in order to convert the documents.

Recall Aubrey's schedule from Table 1, where she was assigned duties for most class periods

and often multiple classrooms each period. Aubrey had set aside time on Friday mornings to

complete file conversions. The time in the schedule set aside for Aubrey to prepare materials for

students during the week was often used for pulling students from classes to go over or re-do an

assignment that was not modified or made accessible for the student. I asked Aubrey if she

believed that having to pull students and do small groups was the result of not having

assignments in advance so she could convert or adapt materials. Aubrey replied:

> Yes, and then again, no. Because I don't think that I myself can do that. I mean, teach
>
> my class on top of co-teaching. So I say yes and now I think it is a result of that but I
>
> also think it kind of comes back on the teacher hands, they should be modifying for them.
>
> They get their copy of the students IEP accommodations just like everyone else does.
>
> The time it takes to transfer information into the text-to-speech software is a long
>
> process. I could sit here all day and I don't think I could keep up with every teachers
>
> requests. The teachers have to learn how to do it (save files and convert files) as opposed
>
> to me being their crutch and doing it for them, because to me that means the next two to
>
> three years they're going to come to me to do it. That is why I think it is so key that we
>
> teach our teacher how to use the software.

Aubrey's frustrations lasted most of the spring semester. Aubrey had been looking for a way to

ease some of the expectations she had inherited. She tried free online file conversion

applications only to discover it required a lot of time to edit and check documents for accuracy.

She communicated and attempted to get materials in a timely manner more than once with no change noted. However, she did continue to look for any assistance wherever she could find.

It was during a conversation at the February training that Aubrey had first discovered some ways to address her frustrations. As she would later recall, another teacher in the training had asked how she could make the text from a PowerPoint accessible in the text-to-speech software. As the presenter explained the process, she mentioned the ability to save most Microsoft Office documents as PDF, RTF, or HTML formats. These files would be accessible for the text-to-speech software and make conversion of most documents less complex. Aubrey decided that instead of converting all the word documents that teachers sent her, she would have the general education teacher save the file as a PDF, RTF, or HTML in the beginning. Aubrey, along with Lois, set up short training sessions to show the teachers how to save the file in an accessible format. Aubrey discussed the results of this training:

> I think we have all come to the conclusion that saving documents in the RTF files are the
> easiest to do and easiest to save. So now teachers are starting to help me out a little more.
> They are creating these documents, saving two documents; one as RTF in the class folder
> and one as a Word document.

Her science teachers were happy to comply with her request. They would save the files as directed and placed them in the class folder for the students to access during class. This simple step saved Aubrey many hours of work.

Asking general education teachers to save the materials they had prepared for the entire class in an accessible format from the beginning was the first step in creating an awareness of Universal Design for Learning (UDL) for the teachers Aubrey served. As discussed in chapter two, UDL provides the structure for designing inclusive classrooms that provide materials and

methods that accommodate the curriculum for diverse learners from the start. Aubrey's desire for the general education teachers she worked with to save digital copies of their assignment in a PDF, RTF, or HTML instead of the typical doc or docx formats provided a path for new learning and awareness amongst the Harper staff.

Through Aubrey's experiences, she understood the process of providing digital text for students with learning disabilities. She also understood what the requirements would be to create accessible files. While overwhelmed by the expectations placed on her, Aubrey experienced tremendous frustration but did not surrender to those frustrations. Instead, Aubrey was able to rely on her own resourcefulness to navigate through her challenges to discover acceptable solutions. In doing so, Aubrey aligned herself with Harper's culture of integrating accessible technology by whatever means necessary. In the next thematic description, I explore Aubrey's perceptions of students' reactions to digital text and the challenge of implementing accommodations.

Don't Call Me Special: The Challenges of Implementing Accommodations

Aubrey walked into a crowded sixth grade language arts classroom and turned to the right immediately as she entered through the door. This classroom was full, from wall to wall, from the teacher's desk to the back with student desks. There was no way to get to any of the rows except the path right in front of the teacher's desk. I followed Aubrey up the right side and took my place in the front left of the classroom behind the teacher's desk and computer. Aubrey had just informed me that this class was full and she was certain the counselors had packed the class with every special populations group the campus served. I watched as the students entered the room and navigated their way to their assigned seats. The language arts teacher addressed students as they arrived, checking on library books, and accelerated reader tests. As soon as the

bell rang the language arts teacher and Aubrey gave the lesson on Analogies using a PowerPoint, videos from Discovery Educational, and a worksheet. I made notes as to which parts of the room Aubrey visited in an attempt to identify the students served through special education. Aubrey was full of energy and moved from one side of the room to the other. She was vocal in this class, calling on students and rephrasing questions with a humorous delivery. I was not able to confidently predict which students were receiving special education services and who were not. During the few minutes that we had between classes I spoke to Aubrey and her co-teacher on this subject:

LA Teacher: In this class we have six English language learners (ELL) at various stages and then we have another six that have service pages for co-teaching. We have three that come out of the district so it's a very challenging class.

Debra: Is this your largest class?

LA Teacher: Yes.

Audrey: Hey! On George, those analogy pages, he was like "I got these."

LA Teacher: Savanna took off too, managed a lot, whoa.

Audrey: All of my guys did and that was like what I tell people – (gives high five to LA Teacher).

Debra: Which students were you supporting?

Audrey: Could you not tell? (Excited and gives high five to LA Teacher)

Debra: No, not really.

Audrey: That's awesome to know.

Debra: I thought they were on the right but then you spent a lot of time on the left and you were also in the middle.

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LA Teacher: We found also with the ELL's, when we grouped them; they were doing

everything in Spanish. You know, one would pick up on what was going

on. Translate for everybody. Well, that -- we saw them getting stronger in

their (native) language, we sort of pulled that scaffolding back and sort of

sprinkled them around and there was one girl that just refuses to speak

English. We've been working with her.

Aubrey: She's good. She will not do it for us. She'll talk to me somewhat for a

second but usually she will look to one of the other guys to translate but my

guys are spread out and I say, I float but I help everyone in here no matter

if it's on their service page--

Aubrey and her co-teacher took pride in being able to service all the students together without

segregating or separating them within the classroom. Aubrey would often tell me that "they are

all mine" and that it didn't matter if the student who was served was a special education student

or a general education student who needed assistance. Aubrey was there to help them all.

However, what she would not do intentionally, or unintentionally, was to call a student out by

their disability. It was almost as if it was a pact or an agreed upon goal with all her teachers.

This goal, however honorable, had also become difficult to fulfill.

Aubrey would struggle between providing the mandated accommodations and not calling

students out by their disability throughout the school year. In our first interview I asked Aubrey

to tell me about a time when she felt challenged by inclusion.   She responded, "I always feel

challenged by inclusion!" Aubrey explained:

I think it is challenging to not call another student out. I find inclusion difficult in general

education every day. It is hard not to call a student specifically out. It's hard when

you're so used to working with the same students' everyday not to say "so and so, here's your modified version" It's hard, so I am constantly reminding myself of [pause] not calling the student out and constantly reminding myself that [pause] we are working as a group.

Aubrey made it a mission to be everything to every student in the classroom. She did this in an attempt to keep from labeling a student or "calling out" the student due to their association with her. Her hope was that if any student could ask a question or receive assistance from her, then the students who genuinely needed her assistance would be less hesitant to refuse her help. I was able to see this type of interaction in two of her classes. In another language arts class, Aubrey shared an active role in the delivery of instructional content. She would add to, clarify, or rephrase the content area teacher's explanations to assure her students as well as the other students could understand. Students would raise their hand and call out for Aubrey's help. Aubrey would write their names on a card to be sure she didn't forget who had called for her. This was Aubrey's dance and the students' names filled her dance card. Aubrey's strategy worked well in some inclusive classrooms however not all students or classrooms work well with this strategy. Aubrey shared some of her struggles in these excerpts from her journal:

March 29, 2013 - Kids took a test today but only one wanted to use the text-to-speech software and would only do so in the Harper's Ferry room. Sixth grade inclusion class went excellent. Pulled a group of students and worked on persuasive essay using word prediction software.

April 9, 2013 - Difficult time getting students to embrace the software. Seem they see the program as calling them out. It doesn't help that the computers are faced where other

students can view. Struggle with that because I need to monitor what they are doing and still work with the other students. Will find a solution!

April 10, 2013 – Students did good today with the work. Worked on outlines in software. Inclusion students didn't like using the program in class. Pulled to Harper's Ferry to use software.

Some days were better than others, Aubrey had success in her science inclusion classes, however, the language arts and history classes did not always work as planned. Aubrey found that when the students hesitated or refused to use the text-to-speech or writing support in the inclusion class, then taking them to another room was the preferred environment for some students. When she needed to take kids to another room she would use Harper's Ferry or her resource classroom. Harper's Ferry is a collaborative effort between general education and special education to provide additional academic support to the Harper's students. This support is offered in a separate classroom that is monitored by both special education and general education teachers. Having this additional resource to support her students was valuable to Aubrey. She shared her classroom with the other special education resource math teacher, so the space was not always available for Aubrey. Aubrey recalled a student who refused to use any of the software supports in the general education class and only in Harper's Ferry if no one else was there. The minute another student walked in, this student would refuse to continue even if the computer was faced away from everyone. There were times where the goal of not calling a student out by their disability would become a barrier to implementing their accommodations. If a child refused the accommodation in class, refused to go to Harper's Ferry, or be pulled into the resource classroom, then there was no authentic attempt to implement the accommodation. The use of digital text in some cases had become a choice to students and not the required

accommodation indicated by the ARD committee. Neither Aubrey nor Lois reported going back

to an ARD meeting to discuss the accommodation or alternate strategies for students that were

refusing to use the digital text. Aubrey continued to make an effort to implement the

accommodation and strategies while dealing with the students' refusals. Working in seclusion

was proving to be successful for many students; however, Aubrey was conflicted between the

purpose of inclusion and the need to pull students out in order for them to receive their

accommodations.

Aubrey's role as the inclusion co-teacher was to accommodate the curriculum and

provide support services for those students who needed extra support. Her personal purpose was

to make sure that her students succeeded in that classroom no matter what accommodation they

needed. She was prepared to offer a folder for her students every single day when they walked

into the class, making sure that they had a highlighter or that their work was already highlighted

or that there were color overlays. It was her goal to make sure that her students would succeed in

the class without being called out and without their engagement and learning being made a big

ordeal in the classroom, and treated just like any other typical student. This role in and of itself

was a means by which student's felt called out and Aubrey continued to struggle:

> I find it difficult with my students with autism, because most of the kids know why I am
>
> there for that specific student because of certain behaviors that they tend to call
>
> themselves out more than other disabilities. And I struggle sometimes with having an
>
> AU with another disability. Because that other disability doesn't want to be called out
>
> and labeled with this one. So they kind of have an internal struggle, I struggle a lot with
>
> inclusion.

Aubrey knew that her middle school students would understand her presence in the class was for them. She recognized this as a cause for concern among the students. When students inquired about her purpose for being in the general education class, Aubrey turned it into a positive thing. In response she stated:

> They know, they figure it out and they see it so any time I want to work with my students, they would rather be pulled out which I see more as a calling out or putting a label on them as opposed to me going and putting a post-it and saying, "Go look at the computer and finish this." But they would rather be pulled out. It seems that pulling them out kind of defeats the purpose of having them in a co-teach class… sometimes; cause for a lot of our kids it kind of holds them back keeping them in there. So if we see a kid that needs some reteach, we pull them out and bring them in here where we have the Smartboard and the text-to-speech software.

Aubrey identified this as one of the hardest issues to work through. Students did not want to be singled out as disabled, and some students are not motivated to try the software. Aubrey often spoke about this with other teachers. It was a common concern among the special education teachers and a few of her co-teachers even when some other teachers did not care about this issue with as much passion as Aubrey did. She explained:

> I talk about it a lot with other educators just because I have it closer to my heart knowing that I have a child with a disability and knowing that he may be put in that situation and he may not want to be -- hey, Jack, do you want to use the computer? He may not want that -- that attention so I think we look at different ways and different approaches. But then when you're shot down so many times by student it takes a toll on you. You're like, after I ask him five times, you know, a week, does he want to do this and I get the same

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response and the same response it's kind of like, you get to the point where you're

throwing your hands up going, okay, how can I help you?

Aubrey became emotional when she spoke of her purpose. Her purpose was to help students

succeed. She felt a strong connection to the campus culture of implementing digital text and the

accommodation could indeed be the key to her own child's access to general education classes.

Aubrey envisioned her child as well as her future students having a greater access to the general

education classroom due to their use of digital text. It was this motivation that pushed her

forward to continue to find a strategy or method that would reach the students who would resist

her assistance initially.

Aubrey and the Harper staff made continuous attempts to implement digital text for

several students. There were mixed results in the willingness of the students to use the

accommodation in the general education classroom and at any time when another person could

see them. During my interviews with Lois, Elia, and Aubrey I asked them to evaluate the

number of students who had digital text as an accommodation when they arrived at Harper in the

sixth grade. All three responded that they were not aware of receiving any sixth grade students

with digital text as an accommodation when they enrolled. Lois identified that receiving

students with no experience using digital text is a process rather than a barrier. She recognized

getting students started with digital text is a long process that required dedicated personnel that

would see the process through the struggles and frustrations. This was the situation Aubrey had

been dealing with during the time of this study. She had students who were difficult to reach for

various reasons however Aubrey did not give up on the students or on her need to find ways to

address the students' learning needs or engage them. She would often feel defeated and wonder

where she would attack next time and there was always a next time. She could not quit. If she

were to quit and give up on her students, it would be the equivalent of giving up on the future

hope for her own child.

In this case I presented a description of the participant Aubrey, followed by a description

of how her case was framed. I reviewed Aubrey's roles and responsibilities as a co-teacher and

described how she redefined her role. I used Aubrey's timeline illustration to explore her

journey where she discovered deep value in assistive technology. I reviewed the struggle of the

text conversion process and Aubrey's attempt to move her co-teachers towards a UDL

philosophy. I introduced Aubrey's value in not calling students out by their disability and how

this value interfered with the implementation of the accommodation for some students. In

closing, Aubrey's purpose in her daily practice of teaching was explored through the connection

of her child with a disability and her hopes for his future with technology. The challenge that

Aubrey faced also seemed to be a common experience for the other participant Sunshine.

Sunshine, as described earlier taught a seventh period language arts class. In the next section I

discuss the thematic narratives generated from data collected in Sunshine's case study.

Sunshine: Surviving the Perfect Storm

Sunshine teaches seventh grade language arts at Harper Middle School. Her classes

range from inclusion classes to Pre-AP® language arts classes. This case was bound by the

seventh grade language arts inclusion class that Sunshine taught during fifth period. The

classroom was located on the second wing toward the left as one walks from the entrance. On

my way to my first observation, passing by the teacher's lounge and through the double doors

past the library, I was met by a wave of seventh grade students rushing to their next class. This

inside corridor amplified the sound of students that was usually lost in the air for the outside

halls. Turning to my left I made my way outside to Sunshine's class. She was greeting her

students as they made their way to their assigned seats. Most students were sitting in individual desks, lined up in rows from the back of the room towards the front, except for one young man who had seated himself at a computer in the front of the room. As he sat at the computer he could view the Smartboard® in front and to his right. All other activity in the room was behind Paul's seat and out of his line of vision. Sunshine walked to the front of the room and began her lesson on Greek Mythology. Not all of Sunshine's classes were inclusion classes supported by another staff member. For this class, Aubrey was the co-teacher assigned to serve as Sunshine's co-teacher for 30-45 minutes each day. During my first observation Aubrey entered Sunshine's class approximately 15 minutes after the bell had rung and proceeded to involve herself in Sunshine's lesson as if she had been there from the beginning.

On two occasions I met with Sunshine for member check sessions. After all data was analyzed, coded, categorized, and themes recognized, I asked her, just as I had asked Aubrey, if she would help me by giving a title to her story. I sent a text to Sunshine asking her to find a Hollywood movie title for her own story. Receiving several ideas in her return text we collaborated and agreed upon "Surviving the Perfect Storm," a title that summarized the saliency of her experience while creating a symbolic picture of her struggles and successes throughout the school year. Through this case, Sunshine's personal and professional values, experiences in co-teaching, and challenges faced with students and integrating technology are discussed as I sought to understand how Sunshine persevered to survive the perfect storm.

As stated earlier in this chapter, Sunshine was an experienced classroom teacher and co-teacher. She based her expectations on many years of teaching and collaborating with co-teachers. She had experience integrating digital text with students in previous years. However, this year was filled with many *firsts* for Sunshine. These experiences and the symbolic meanings

Sunshine had attached to them are explored in this section. I identified three themes reflecting Sunshine's experience which include: (a) Yin to my Yang: The Interdependency of Teamwork; (b) It Just Became a Projection Screen: I've Never Not Reached a Student; (c) Palm Tree in a Hurricane: Overcoming Challenges. Through these themes, I provide an understanding of Sunshine's experiences, struggles, and successes as she integrated digital text in the inclusive classroom.

Yin to My Yang: The Interdependency of Teamwork

Sharing her classroom with another teacher was not new to Sunshine. As mentioned in her participant description, she had eight years' experience working in co-teaching situations. In these years Sunshine identified many characteristics of a *good* co-teacher and characteristics of a *bad* co-teacher. She was not shy to mention that it was *her classroom.* Yet, such ownership of her classroom did not imply that Sunshine dominated and controlled the instruction in her co-teaching classes. Instead, collaboration, respect, and trust were on the top of her list of in order to create effective learning environments. Consequently, Sunshine described her co-teaching relationship with Aubrey, "She's my yin, and I'm her yang kind of thing because they're equal in my opinion."

The ancient Chinese philosophy of Yin Yang is used to explain and understand the Chinese culture. The symbol of Yin Yang represents the dialectical thinking in the ancient Chinese culture that all experiences are a dynamic unity consisting of paradoxes (Fang, 2012). According to Fang (2012), the symbol consists of a circle divided into two teardrop-shaped halves, one white (Yang) and one black (Yin). Each half contains a small circle of the opposite
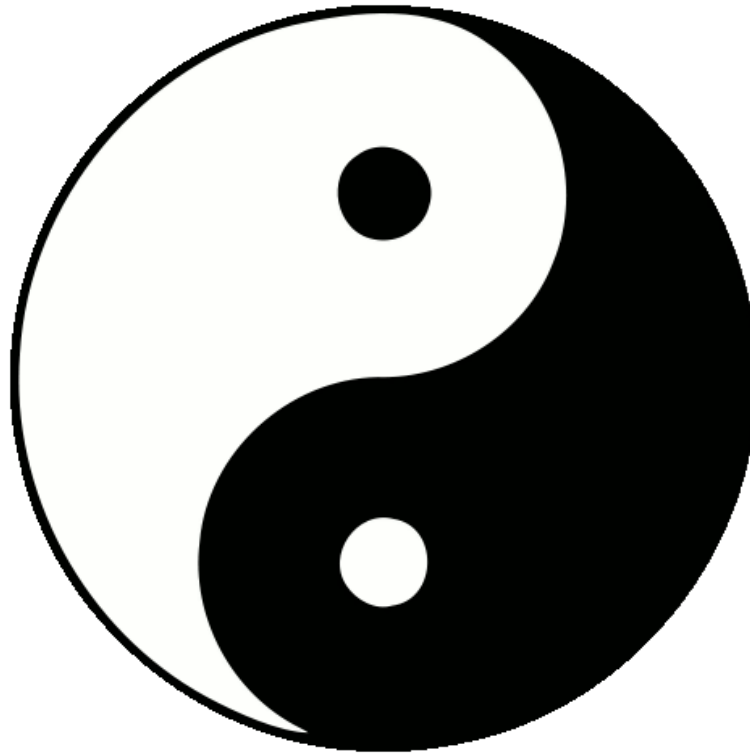

Figure 23. Yin Yang Symbol

color, giving the constant reminder of the interdependency of the halves. The co-teaching relationship of Sunshine and Aubrey is examined using the representations of the Yin Yang symbol (Figure 23).

Just as the two halves of the symbol are interdependent on each other, the co-teaching relationship of Sunshine and Aubrey also demonstrated instances of interdependency. I witnessed times when the two seemed to move and speak as one and at other times they would

be opposite in their expectations and methods. In neither situation could one be successful without the support and trust from the other. Sunshine explained:

> Even though I'm writing the lessons I still go to her [Aubrey] for help. It varies from day-to-day because there are days when she totally grabs it by the horns. I'll go out and she's like, am I right, I'm like, oh yes you are, you know. So it just depends on what we're doing.

The flow of this give and take relationship is smooth but unrehearsed. Like the variation within each side of the Yin Yang symbol, Sunshine and Aubrey's roles within the classroom would shift from day to day or minute to minute. Aubrey's experiences and training in special education had enabled her to recognize areas and instances where students were struggling. During class lectures whenever Sunshine had not phrased a statement or concept clearly, Aubrey would rephrase or ask leading questions to Sunshine in order to facilitate a clarification. As their roles shifted within the process of instruction, much like the each side of the Yin Yang symbol, more input would be given from one side and less from the other and then back again. In Sunshine's last interview she explained this give and take relationship:

> It is like a marriage and I mean, there's always the other who is stronger in a different regard. It's just like being a mom and a dad and these kids play you like a mom and a dad and you have to figure out you're on the same team and if you're not on the same team then it's pointless to be in the same room together. She's the one that keeps me balanced and when I say something that may be a little too upper level, she brings it to their level, and it's in no way, shape or form a jab at me but it's a reminder.

The interdependency in creating, planning, and delivering instruction included Sunshine's lesson

design, Aubrey's modifications, or accommodations, and the freedom to participate in lesson

delivery at any point. Sunshine would develop the lesson and then Aubrey would look it

over and adjust if needed or provide modifications for each lesson. During lesson delivery,

Aubrey would interject to clarify, explain, or rephrase a statement by Sunshine. Any lessons that

included the use of digital text would require Aubrey to prepare the files for student access. This

is a task that was exclusively Aubrey's to perform. The involvement and role of each co-teacher

increased or decreased as each step of the process was implemented. The relationship of these
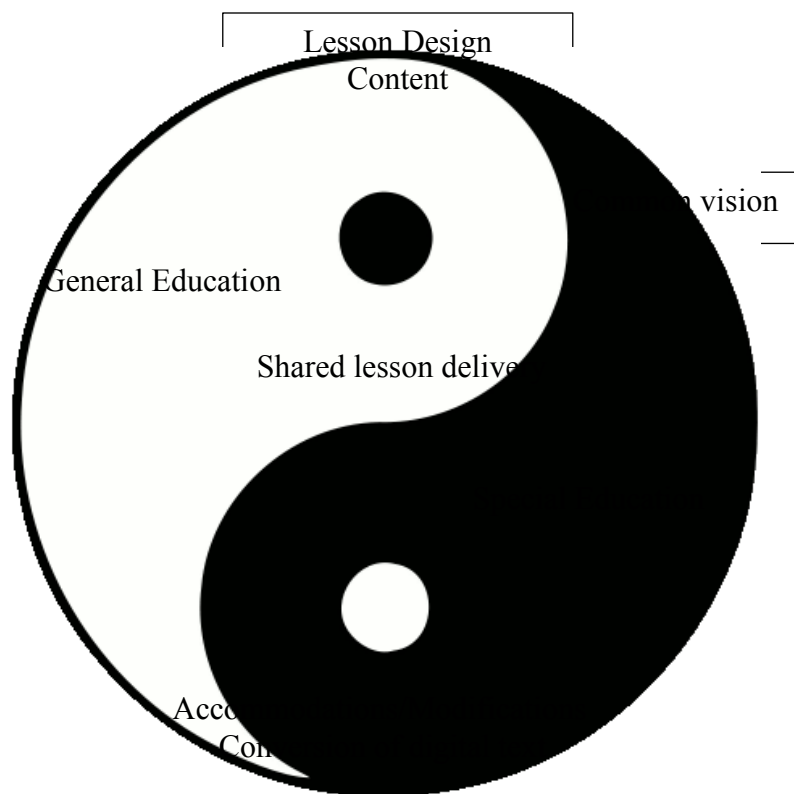
roles is shown in Figure 24.

Lesson Design
Content

vision

General Education

Shared lesson delive

Acc
Co

Figure 24. Co-teaching relationship as shown within Yin Yang symbol

The black and white halves of the Yin-Yang symbol are similar to the opposite sides of a coin, completely different but yet necessary to make the whole. Fang (2012) refers to the two sides as complementary forces with yin representing the attributes of yieldingness and submissiveness and yang representing unyieldingness and dominance. In reference to dominance in a classroom situation Sunshine confessed:

Going back to that whole I have to be in control. (Laughter) You know, and I -- and it's just me, you know. Like, creating lessons and that kind of thing, you know, I enjoy getting input, you know, and but since I'm the ELA person, you know, and looking at the curriculum, you know, and then we bounce off ideas like that, being in the classroom know that like, I do not mind sharing my classroom with others. I don't mind teaching with others but, it is my room.

Sunshine was the content leader and ultimate master of the classroom. She took the lead in all instructional activities. Her co-teacher was the visitor, submissive to her rules and lesson. However, the purpose of teaching an inclusive class and implementing accessible materials required a strong partnership. This relationship was built upon trust as Sunshine explained:

You know, in those instances but it's because I trust her. You know, and that's a big thing because when you are in a true co-teaching role there must be trust and that's why I say like, when individuals come in and they try to do it, that's on my -- oh, no, no, no, no, no, no, no. You know, because there isn't that trust. There isn't that -- you know, there isn't that cohesion that's built in there. I trust her. And she knows things that I don't know or she can put it in a way that I don't get and you know, it's a give and take Sunshine and her co-teachers each have distinct yet different roles in the classroom.

With the addition of trust these roles are able to move through the motions of giving up

the lead and taking the lead in the classroom instruction.

The addition of trust and a common vision are represented by the white and black dots within

each half of the Yin-Yang symbol (see Figure 24). The white dot in the black area and the black

dot in the white area suggest coexistence and unity of the opposites to form the whole (Fang,

2012). The common vision shared by Sunshine and Aubrey was found in the goal to not call

students out by their disability. The students during the 2012-2013 school year posed a unique

challenge for Sunshine. For the first time in her teaching experience she was faced with students

that showed a reluctance to use digital text with text to speech or the writing supports in front of

other students.

> I would write my lessons and I would have Ms. Aubrey and I would tell her, all right, this
>
> is what we're doing. This is what needs to get done, even when we were trying to
>
> implement and implementing text-to-speech, the digital text to have it transferred and
>
> copied.   But… and the students and I even wrote this in my journal. This is the first year
>
> in all my years teaching that my SPED kids didn't want to be pointed out. They didn't
>
> want to be -- I mean, even if I handed out tests and just went one by one by one, but
>
> theirs was modified, they would still, even if you like, you know, shortened assignments
>
> or shortened tests, you shortened it, they would still do every single one of them. And
>
> I'm like, you realize it's the mandated accommodation right? It was hard getting the stuff
>
> scanned into the software and that was very frustrating.

In the past, students who were in Sunshine's inclusion classes would use text-to-speech software

in the classroom during lessons and at home to complete homework. This common vision of not

to call students out by their disabilities required Sunshine to alter her lesson plans of implementing digital text throughout her classroom. Sunshine described the changes:

> They fight being singled out, and I would, too. I don't want to be singled out, so it's tough because they don't want to -- you offer it to them and kids will say no, I don't want to go. OK, so what we've kind of had to do, I don't know even know if I can say it, but what we kind of had to do is, we'll take our kids who need the oral support, but then we'll ask a couple of other kids like, hey, would it make it easier if I just read it out loud for you? If they're like yeah, it's like, OK, so we'll take our kids who honestly need it on their IEPs and then our other kids, yeah, it would just make it easier for them and they don't have IEPs, they're not under an umbrella of anything whatsoever, but this way it's not just, I'm going to take my two, three little kids with me and, well, why are they leaving, you know what I mean? And this way, so it's more comfortable.

Sunshine whispered and lowered her head as she mentioned "I don't know even know if I can say it," as if she was breaking the law and frightened to let anyone know what she had decided to do. She was unsure of the rules regarding the usage of the software and hesitant to allow anyone that her administration had not approved access. Doing whatever was necessary to reach a child was a value that Sunshine held dear to her heart. Thus the requirement to provide the accommodation of digital text led to the implementation of text-to-speech software with any student who needed this support. In spite of her lack of awareness of UDL, Sunshine had stumbled across a key principle of providing multiple means of representation giving her students a variety of ways to access their information.

Holding the common vision, not to call students out, created a unified and constant reminder of the interdependency between each side. As seen in Figure 22, just as in the co-

teaching relationship, each member was unique and brought their personality and skills to the teaching relationship. However individually, the purpose, vision, and work of instruction did not meet the high expectations Aubrey and Sunshine had set together. The interdependency within the co-teaching relationship was a crucial aspect of the relationship. In Sunshine's experiences implementing digital text, text-to-speech, and the writing support using the campus software, she confirmed that without her co-teacher there would be no implementation. This was one of the areas that she totally trusted and depended on the co-teacher to accommodate, create, and convert files to make the curriculum accessible for all her students.

The provision of digital text was interdependent upon the relationship of Sunshine and her co-teacher, Aubrey. Without a co-teacher who had her trust and respect, providing this accommodation would be compromised. It was an accommodation that she genuinely understood to be important for her students' success with the help of her co-teacher. In the next section I explore Sunshine's experiences with technology, change, and her challenges with students. I also discuss the symbolism and meaning she assigns to her experiences throughout her school year.

It Just Became a Projections Screen: I Have Never Not Reached a Student

Shortly after I received Sunshine's permission to contact her regarding my research, I called her on her cell phone to discuss the details of her participation. During this conversation Sunshine briefly talked about her experiences implementing digital text and using technology in her classroom. She was curious about using the text-to-speech software and writing support with her whole class using her Smartboard®. I did not give this request much thought, at this time, since I had plenty of experience using and demonstrating the software on a Smartboard®, I did not think this would become an issue. A few days later I returned to the Harper campus to

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complete my first observation of Sunshine's fifth period language arts class. While in her room I took notice of the Smartboard® in the front of the room. This was not the Smartboard® I had expected to see. There was a projector that was labeled with the Smart® brand attached to a whiteboard with a metal frame in the front of the room. This was the same kind of whiteboard that I had used in my classroom with dry erase markers, not the kind of interactive whiteboard I was familiar with. This board would only become interactive if one used the synchronized pen that came with the system. After class ended, I asked Sunshine about the Smartboard®. It was at this moment that I first learned about the challenges Sunshine experienced about the changing Smartboards®. In the next months I would come to understand just how significance this Smartboard® was to Sunshine's journey.

During the last interview with Sunshine I asked her to complete a timeline drawing of her year at Harper with the implementation of digital text as the focus of her drawing. Sunshine created a pictorial representation of her school year in the form of drawings to represent the most meaningful events of the year (Figure 25). She was excited about participating in this activity,

Figure 25. Sunshine's timeline representation

and even went to her desk to find more drawing tools to choose from as she began to represent her experiences artistically. As she drew the timeline, she talked about the meaning of each

figure she had drawn and the significance it held in her experiences. I watched her facial

expressions shift from a smile and gleaming eyes to sadness in her eyes and mouth, and a slump

in her shoulders while she drew. When she finished a first round of drawing, I asked her to go

back and add her emotions during each stage of the timeline (Figure 26). Sunshine had chosen to

draw the first step in pencil only reserving the colored markers and pencils for the addition of

emotion. As she began to color in the drawings, Sunshine purposely stopped at the specific
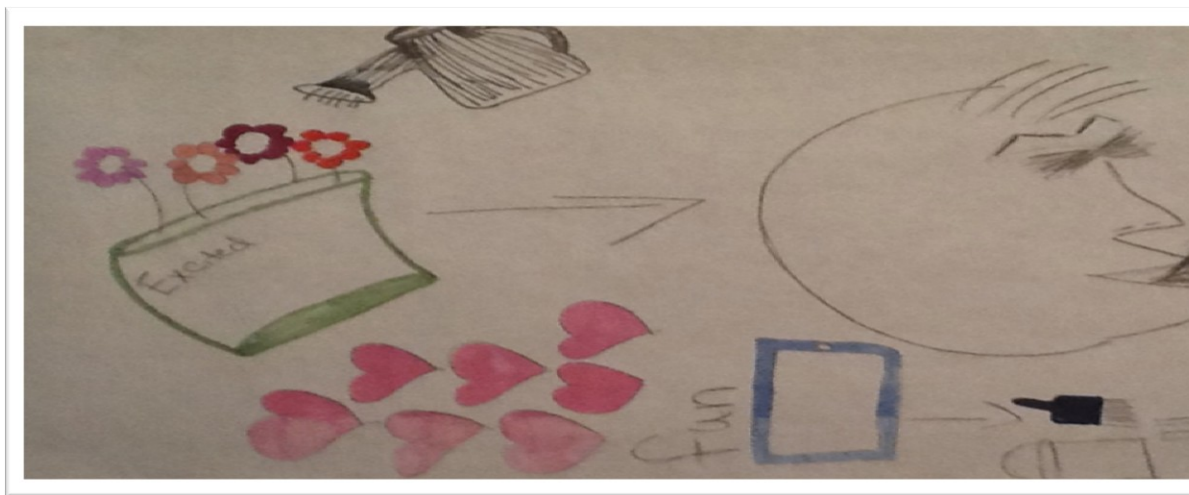

Figure 26. Sunshine's representation of happiness

points that had come to symbolize the stressors and frustration points of her entire year. Color

represented happiness and there was no happiness in these experiences. At these points, the

color stopped and did not return for the remainder of the drawing. After she had colored in the

happy moment she explained the meanings she had attached to the first drawings:

> It's the beginning, you know, it's like walking through the door. And I put flowers and
>
> water, you know, because I'm excited. I'm happy. It's the beginning of the school year
>
> and I love nurturing my kids and I actually love my garden, you know, so I need to water
>
> them and be happy and that kind of thing. Then this not only represents -- you know, it

represents a lot of things that were going on in the classroom, and not just in that class

but in general.

Sunshine was bringing in her experiences from all her classes during this year, not just the fifth

period class I had been observing. Every class's experience had become part of her whole

experience. She could not separate them from her fifth period class. Her courses and students

were all a part of her. As she continued to talk about her drawing, I would bring her back to the

beginning. Sunshine continued to explain her drawings starting with the colored in

Smartboard®:

> Honestly, with technology, I mean, like with the technology, I could draw hearts up until
>
> I got this. OK, because I'm telling you, man, I love, love, love, love my Smartboard®.
>
> Loved it. The kids loved it because it was interactive and we were happy. We were
>
> happy. Because we had fun, I didn't know how to draw fun so I'm just going to write it
>
> out because it was fun. It was interactive. Oh, I know what I could draw. And oh, man,
>
> they just loved it and it was so -- God, they got it. They got it. Ooh, ooh. But it stopped
>
> like this. (snapping fingers) When they painted my room, it changed.
>
> The dynamics changed. Like the energy in the room changed. It was very, it was
>
> almost… it was just real negative. The Smartboard® was gone, the room smelled, the
>
> kids hated it. I wanted to quit… many times. I don't know if every teacher goes through
>
> that, you know what I mean?

It was a bit ironic that at the very spot that Sunshine stopped using color was at the event of her

room being painted. The very event that was to bring color and new beginnings to her classroom

had in actuality become the culmination of the biggest challenge that Sunshine endured. The

painting of her classroom brought a change that almost demoralized Sunshine. Not just from the

painting, but the combined pressure from all her struggles, Sunshine had grouped all the challenges together, each bringing its own meaning.

Figure 27. Sunshine's representation of stress and frustration.

Sunshine was experiencing a rough time with one particular student, Paul; this was one of the contributing stressors for her. Paul had been represented by the large head which was placed in the drawing right above the colored Smartboard®, the paint brush, and the figure of Sunshine crying (Figure 27). This representation of Paul had overshadowed the Smartboard®, the painting materials, and Sunshine herself. As she described this part of her experience, Sunshine had switched from using color markers back to the pencil she had used to start the timeline. She elaborated:

> And this year it felt very, very tough, you know? And I wanted to quit, I just wanted to…
> go back to selling cars, wiping tables, you know. And a part of me is like, is it because of
> what I'm going through? I was looking at jobs. I'm multi-talented, and then, and then I
> got this Smartboard®. I don't like this Smartboard®. I like it but I don't like it. I don't
> like it because, (I'm just going to draw a hand) because it's not truly interactive.

As Sunshine talked about wanting to quit she picked up a blue marker and added color to the tears that were coming from the speech balloon she had drawn (Figure 26). The speech balloon

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was coming out of the large head she had drawn to represent Paul. In the speech balloon she had written one word, *Hateful,* this represented the verbal abuse she had endured from Paul and other students. The tears represented the pain and sorrow she had felt during this school year. As I listened to Sunshine talk about this drawing I noted in my journal that her representation of Paul had come to represent the complete collection of her struggles and challenges. Paul was a challenging student with high functioning autism spectrum disorder in her fifth period inclusion class. I asked Sunshine to elaborate on the challenges she faced with Paul:

> It felt like it was an uphill battle with him. You know, trying to communicate with parents, you know, and every day -- every day I was being called a bitch. I was being told fuck you and fuck off in front of my students, you know, and I just spent I mean, 30 to 40 minutes a day, a class period just on, you know. And I have kids in my other classes who just wouldn't sit down. They wouldn't -- I'm like, you've got to be kidding me, you know? But for now this is him when - the way he was in the beginning. He was so mean. He was so misunderstood. But it was also me too because I would get so mad and so frustrated, I would just be like, get out.

Enduring the verbal abuse and disrespect from Paul was exhausting for Sunshine. However, her pain and struggle was not just with this one student. Other students had also caused stress and challenges for Sunshine. As she continued to shade in the drawings, Sunshine explained their representations further:

> This not only represents -- you know (referring to Paul), it represents a lot of things that were going on in the classroom and not just in that class but in general. You know, but really, you know, I felt there was so much, like, negativity, you know, like this is the first year kids just didn't want to work. You know, lazy and you know, that's why you see,

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you know, hateful -- and hateful being attitudes, actions, words, whatever, pouring down

and that's mean and I'm sad because I was like, you've got to be kidding me. You

know? And then of course here's the beautiful star for that wonderful STAAR test, you

know, that's a very stressful thing. You know, for two tests, you know.

What Sunshine had drawn and described was the individual experiences she had during the year,

all rolled up into one large head over shadowing the loss of her Smartboard®. The Smartboard®

had given her joy in her lessons and engaged her students. Her fight was not with Paul, the other

students, the Smartboard®, or the STAAR assessment. As she spoke later during a member

check, the true representation of the new Smartboard ®, the large head, and the shrinking teacher

was the inward struggle she was having within herself.

I was so just not understanding of why he didn't get it. It doesn't help when you have to

teach to the damn test. When I put my ego out of the way I was saying like it's about

him, not me. It's about these kids and these kids are suffering because I am not trying to

find what works. Instead I am just (paused) I am the adult here, how do I dare (paused) I

had to push that page. We all know that we are all different learners. Why am I making

it so difficult for this kid? I guess, just because of the way he was with me and the things

he called me, it was just like I didn't want it. It was hard, but once I just realized that if

he loves technology, and is a non-verbal communicator there has to be a way. (Sunshine

cried) Cause I'll be dammed if I'm not going to reach all of them. Seriously and I had

given in, had to change

Sunshine showed pride as a woman and an educator. On many occasions she would mention her

value in never failing to reach a child. This was her standard of teaching, which applied to all

students regardless of disability or other unique features they possessed. This value was

challenged by the presence of Paul. In her attempts to work with Paul, Sunshine found that her

personal preferences and teaching style was not effective. In addition, there were

accommodations, such as digital writing supports, assigned to Paul that had become difficult to

implement. At times, the barriers were often caused by Paul himself. He had severe behavior

outbursts that challenged Sunshine's authority in the classroom and her teaching methods. It was

at those times that Sunshine felt most vulnerable and in those moments she wanted to look for a

new job. However, these moments were also as Sunshine described them, "a come to your

knees" kind of moments. Sunshine had to make a decision. She could choose to stand by the

teaching methods she had always used, methods that were proven successful in the past. Or

Sunshine could choose to give up that which she knew and was comfortable with and step

forward with new teaching methods and strategies that would reach the one student she had

feared she would lose. The value and identity that Sunshine held in reaching every student had

brought Sunshine to her knees and at the same time carried her through a painful time. Sunshine

had chosen to present Paul with the strategies and accommodations that he needed, not the

strategies she had held on to for a long time, because she was comfortable and used to those

strategies.

As Sunshine finished her drawing, she spoke about the changes in Paul's behavior and

his academic success at the end of the school year. In the last stage of the timeline drawing,

Sunshine was asked to project how the next school year would start for her. As she continued

her drawing in pencil, Sunshine spoke of her dream lessons, use of technology and creating a

classroom that would meet the needs of all learners. Sunshine drew a cornucopia, titled *Happy*,

with her hopes for the next school year inserted in its opening (Figure 28). In her hopes for next

year Sunshine mentioned a future training she would be attending. I asked Sunshine if she had

received any training for her new Smartboard®. Sunshine's eyes lit up, as she replied:
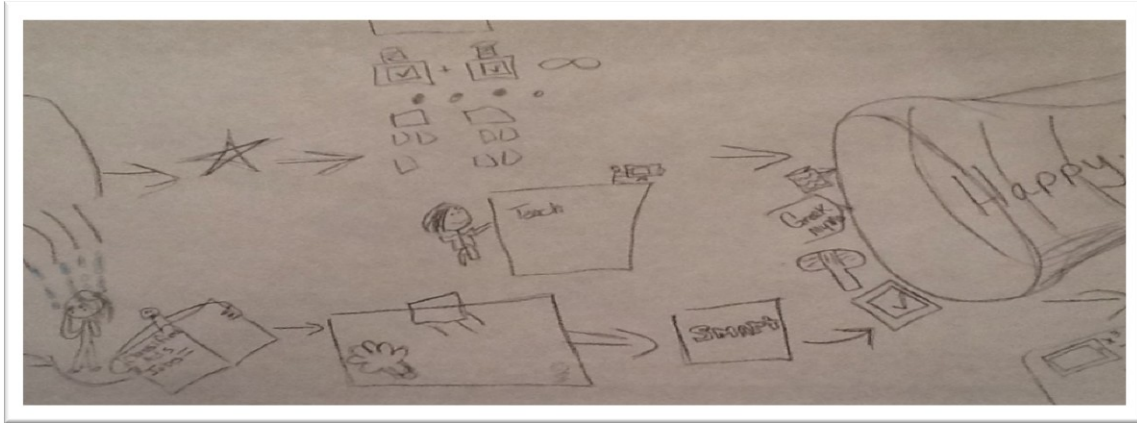

Figure 28. Sunshine's Cornucopia

> Yeah, We had a training just this week, not just this type of Smartboard® but also used
>
> on the other Smartboard® ,but how to use it differently and instead of just using it as a
>
> big whiteboard. So that was good!

Sunshine did not speak any longer of the Smartboard® with contempt or distaste. Rather, there

was hope that had been gained from the training at the end of the school year. Her view of the

Smartboard® had gone from being a projection screen to an instructional tool that could be used

for many topics. Sunshine's experiences during this school year resembled a roller coaster ride

with the challenges and successes she experienced in her attempts to implement Paul's

accommodation of digital text and enduring the change in the physical environment of her

classroom. She had allowed her difficulties with Paul and her frustration over the new

Smartboard® to disempower her. Consequently, she projected her frustration outwards in how

she performed as a teacher and felt discouraged, overwhelmed by her negative feelings. Once

she could step back and review the school year with fresh eyes, Sunshine could admit that the

frustration and stress was with her and not the Smartboard® nor Paul. This realization allowed

her to view her experiences differently and her struggles and overcoming them became the means through which Sunshine could make plans to improve her future.

In the next section I take a deeper look into the struggles Sunshine faced and how she overcame the challenge.

Palm Tree in a Hurricane: Overcoming Challenges

On the last day of the school year, I visited the Harper campus to pick up some assistive technology equipment that had been lent to the campus during the school year. I loaded the equipment and decided to sit in my car for a few minutes to update my contact log. I looked up from my binder and noticed Sunshine walking towards my vehicle as she was leaving the campus to start her summer vacation. She was smiling and walking in quick paces. I rolled down my window to catch her attention before she passed by me. What I was greeted with was such a happy and energized person, not the image of Sunshine I had remembered from my last

Figure 29. Sunshine's glow

interview (Figure 29). During the last interview Sunshine was experiencing stress, frustration, was visibly exhausted and ready to leave for the summer. However, today she was different. It would be easy to assume that her happy energetic image was due to school being out for the

summer, grades all turned in, and all paperwork for the numerous clubs and organizations she either sponsored or belonged to were complete. However, what Sunshine shared with me was more than being happy that school was closing for summer. Instead, she was beaming, feeling inspired. On one hand Sunshine had a large red vase filled with purple irises. From her other shoulder a bag hung, possibly filled with summer reading and projects. I could not help but reflect on how Sunshine had experienced stress and challenges during the semester because of her need to be dedicated to her students.

Being involved and dedicated to student improvement was part of Sunshine's normal routine. During a typical school year Sunshine would arrive on campus at 7:30 a.m. and stay until 5:30 or 6:00 p.m. before heading home which she shared with her parents.   She used the additional time at school to tutor students and work on any committees or programs that she sponsored or served. However, this schedule was not as easy to keep this year. Sunshine had taken on the duty of being the primary caregiver for her mother, who had recently been diagnosed with Dementia. She was no longer able to be at school by 7:30 a.m., as she did not arrive until 8:30 a.m. several times. To compensate for her inability to arrive early, Sunshine would stay late each day in case students needed assistance and also to keep up with the demands of the various committees and programs. Sunshine's focus was on providing support for those students who needed additional help, especially since she was not available before school like she had been in previous years.

Moreover, being the primary caregiver for her mother had affected Sunshine professionally just by the altered schedule. Her ability to teach at the same level of rigor as she had in previous years was also affected as she was deeply distressed about the personal events in

her life associated with her mother's illness. Sunshine shared such an example in her interview in May:

> I'll admit, this year they didn't journal write like they have in the past. I couldn't do it. I would have cried every class period because I would have written about my mom. My other kids in the past, we've written every single day. Different types of journals. There's free writes, there's all sorts of stuff, but I just couldn't do it this year. And we would write some and the kids are like, we're not writing? How come -- and it's because I couldn't and I do everything that they do but I couldn't do it. I tried and it was just like, I started crying. I was like, I can't do this. I'm sorry. You know, and as a writer, that's hard, you know, but I just couldn't do it. I tried. You know, but you've got to be strong for these guys. They don't want to see you crying every day.

As Sunshine shared this example, I witnessed an expression on her face that only reminded me of someone working with deep pain. During our interviews I would frequently pause and stop recording as she needed to take phone calls from her father. It was as if Sunshine was on the edge expecting something bad to have happened to her mother. Perhaps she was expecting an emergency call from her father that her mother had walked off and gotten lost or something worse. Sunshine had prepared herself for the worst to happen at any time and this state of mind caused her to be in fear and pain daily and it was evident that she felt drained emotionally and physically. Sunshine struggled with the idea of the potential loss of her mother and experienced stress from being a primary caregiver. Additionally, because she was overwhelmed with the stress in her life, her professional performance was affected, and that became an added source of stress and concern for Sunshine.

The stress and concern Sunshine had been experiencing was the topic of our second interview. Among other questions, I had asked Sunshine if she felt challenged by inclusion. Her response was quick and firm:

This year's been very challenging because of inclusion. In all my years of doing this, I've never felt the way I felt about it like I have this year, and it's not because of all my students, it is because of one student. You know, of course I feel challenged. I feel challenged because I want them to be successful, because I know that they can be successful, because they can. And they want to as well. And maybe a little bit of a different question and stuff like that, but there's one student who it's been a battle and it's been, you know, he's called me some pretty ugly names in class. When we were trying to figure out how to get him to be a part or whatever, students were very frustrated because they were so far behind, because he took 30-40 minutes of my day, my time, and that was frustrating for them.

As mentioned in an earlier section, Sunshine had intense struggles with Paul, a student in her fifth period co-teaching class. Lesson plans and any special instructional activities that Sunshine had planned often would never come to pass. The amount of structure and redirection that Paul required would take away from the time she had to give instruction to the class as a whole. Sunshine shared from her journal:

In the beginning I was truly frustrated by one student with broad spectrum autism disorder and Tourette's. There were so many days that I felt my students were missing out on learning because of his behavior. I had never experienced a student such as him. I have had students with autism before, but never a student with autism and Tourette's or behaviors that reached maximum override immediately.

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In the beginning and throughout the first semester, Paul would have behavioral issues for up to 40 minutes of the class period. During these times the other students in the classroom would be required to work independently but often sat and waited for Paul to calm down. This disruption along with implementing the digital text accommodations had become the challenging for Sunshine. Meeting Paul's needs which kept her from meeting the needs of the other students became a source of concern and stress for Sunshine as she cared about reaching all her students and did not want to leave any student behind, regardless of his or her abilities.

Paul was scheduled into Sunshine's class due to the high level of structure and accommodations that he needed to be successful. Paul's specific structures would separate him from the main group of students within the classroom on most days. His typical routine was to enter the classroom and walk straight to the front, and sit at the first computer facing the front of the room. Sunshine explained Paul's set up in her class and the challenges he presented:

> Everyday seemed to get worse, but with the help of the Special Education department
> chairperson and my co-teacher, I was finally able to reach him. I realized he needed a
> routine, and that he preferred written communication rather than verbal communication.
> I need to give him non-verbal cues. Each day I prepared a folder that contained a top
> sheet with a reminder of the days date and/or work/visitors to come in days/weeks ahead.
> I created a special folder just for him on the Harper application. Granted it didn't have
> his name on it but it was for him. His top sheet contained the steps he needed to
> complete before his time on the computer.

The folder and checklist were important, however what Sunshine realized was that the most successful strategy was to cut back on the verbal directions and communicate visually. This

resulted in the production of a designated folder that would outline for Paul his daily requirements in class. However, this strategy was not always successful, Sunshine continued:

> He'll read what his chart says to do but when it comes to writing he will refuse to do it. You know, he does it just -- he will not write. He's, you know, and my other kids, the other one that uses the computer, he'll go over here but the most he will write and even when I do the, OK, let's plan this, let's organize it, let's, you know, and I'm visually doing it with them up here, he won't do that final draft. He won't, you know?

In her journal, Sunshine reflected on the beginning stages of the folder implementation. In the beginning, it was common for Paul to pick up the folder and toss it across the room. He resisted the change and would not attempt to use the folder until he realized that the designated folder was his only option.

When Paul began to use the folder on a consistent basis, the transformation that occurred was hard for Sunshine to believe. She described her reaction:

> It was truly amazing! There was no more cursing, fighting, or berating behaviors from him. He seemed to no longer have anxiety and he was content. I made sure his folder was always on his desk waiting for him before he stepped into the room, even the students made sure it was there. He seemed to blossom and the kids became more accepting of their fellow classmate. He even began to write. Not long eloquent sentences, but short to the point sentences.

This success Sunshine reported left me curious. Paul was writing, but what did he use to write? Was he using any of the digital writing supports that Sunshine had available in the classroom? I asked Sunshine these questions. In her response I realized, Sunshine did not know if Paul used any text-to-speech or writing supports with these assignments. This was a process and strategy

Sunshine had delegated to her co-teacher. She was just happy and proud that he was writing and behaving. She spoke of his success:

> Just thinking about it chokes me up because we are talking about a child who refused to write. He loathed coming to my class, and for many months he told me this on a daily basis. Now, he speaks to me. He is courteous. He even apologizes when he cusses. He asks nicely to use the restroom. He has changed, but more importantly, I am changed because of him. The progress we made this year is unbelievable. I thought things would never change. I was able to reach him—we were able to reach him.

I was taken aback by her statement, "I am changed because of him." Sunshine was proud of Paul and the progress he had made, however, what she also expressed was her pride and satisfaction in her own progress. Progress she would not have made without Paul and the challenges his presence involved. Thus, in that classroom both Sunshine and Paul had to abandon previous ways of approaching teaching and learning and embrace new opportunities and remain open to transforming their understanding of who they were as a teacher and a student, respectively. Transformative learning occurred for both of them based out of the interaction they had with each other, mostly grounded in the notion that neither Sunshine nor Paul was willing to surrender to the challenges of the learning environment.

Reflecting on Sunshine's journal entry, I thought of Sunshine's timeline drawing. In that picture, Sunshine drew herself on her knees on the verge of quitting. I had wondered for some time why she did not quit. What made her stay and above all else, why did she continue to deal with Paul's behaviors. In order to fulfill my curiosity, I asked Sunshine these questions in the member check session we had during the summer. She explained her decision not to quit:

I just didn't quit because that is not me. I have been an athlete since I was 6 years old.

You don't quit you just keep trudging along. I don't mind being a failure in some aspects

of my life, but I am not going to be a failure to my kids. Because when they do fail that

is when I feel like I have failed them. So I am not going to quit on them. They already

have too many people that quit on them every day. I am not going to do that, as tempting

as it may be. I love my kids. What am I showing them if I do quit? My mom never quit

on me why should I quit on them?

It was common for teachers to request students be removed from class or an ARD meeting held

to discuss behavior and placement. However, Sunshine did neither of these things. She

continued to expand her reasons:

They didn't want to move him to another teacher. They knew that if anyone was going to

reach him it would be me because I am just that stubborn. I wanted him to leave; I

didn't, because that's not me. And even in the background there was like "you can do

this, you can do this," I had a little cheerleader. They knew that I could reach him,

because the teacher he would have gone to would not have been as effective.   No matter

how much I screamed and hollered, no matter how crazy he made me. In my mind, what

can I do to reach him? I have to reach him because I don't just go to school for a

paycheck. I go because I want to teach my kids to be effective writers. To comprehend

and apply what they are reading to all aspects of their lives. If I quit him, then he's won;

they've won and I have lost. When I say "they" I mean the system. The system has won

because I am forced to pass them when they don't deserve it. They are all special some

just a little bit more than others. I am not going to give you a free ticket just because. In

my opinion, as teachers it is our duty to find any means possible to reach ALL our

students.

Sunshine's journey was difficult and yet she had found a way to survive and emerge with a

renewed vision and purpose. She spoke about her belief in her students. What Sunshine wanted

was for her students to see in themselves what she could see. I had asked Sunshine during the

second interview what she viewed her role to be in her inclusion/co-teaching classes. Sunshine

responded emotionally:

> I think my role is just to… show them [students] that -- I'm going to cry, oh my God!
>
> Wow! (pausing to gain composure) They're not different. They're just like everyone
>
> else. They have that potential. They need to see what I can see and they need to know,
>
> God just made them a little bit better than everybody else, you know, and that's what I
>
> want them to see. I just want them to reach it. I don't want them to think that they're not
>
> good enough; they're not smart enough just because they're a little different. They're all
>
> different. That's all I want. (crying)

Sunshine was embarrassed that she began to cry while answering this question. A seemingly

simple question invaded a personal narrative. Sunshine was proud to be an inclusion teacher and

share her room with her co-teacher. It was this team work that made Paul's and Sunshine's

transformations possible. As Sunshine struggled with Paul's behavior and the challenges of

change and new technologies in her classroom, she depended upon her co-teacher to implement

the accommodations of digital text her students needed. In this area, she fully trusted and relied

on her co-teacher to provide the needed support. She provided the continued expectation and

content requirements for Paul and her other students to complete. Together they were able to

make a difference in their students' lives.

As a result of her transformation Sunshine had a renewed energy to meet her students' needs no matter what she had to do. Sunshine summed up her experiences during this school year:

> This year has been such a blessing. I have learned to be humble, more patient, forgiving, compassionate, and empathetic. I have learned to truly love unconditionally and all because of one student. Even though these qualities have always been there, this experience brought me to my knees, which in turn lead me to my growth, not only as a teacher, but also as a person. And for that I am truly thankful!

Sunshine was content with herself and the conclusion of the school year. She had endured the storm of challenges and behaviors that threatened her profession, purpose and family. She could leave campus for the summer knowing she did all that she physically could do, even though it was not her best year as far as test scores would show, Sunshine knew she had reached her students and they had grown. She had grown.

On the last day of school as Sunshine prepared for the summer break, she learned that Paul was moving to a new town over the summer. She was disappointed she would not see him the next year and fearful of his future. She was looking forward to working with Paul during the next school year as she had volunteered to move up to the next grade. Later in the day Paul's mother had come to the Harper campus to see Sunshine. She had brought an unexpected gift, a red vase with purple irises and a card. This was the reason for Sunshine's beaming smile and uplifted spirit. I listened as Sunshine explained the iris' meaning of faith, hope, wisdom, courage, and adoration. Then with a huge smile she showed me the card Paul's mother had given her. The card read:

> Dear Sunshine,

I can't thank you enough for all your hard work with my Paul. I know he was a challenge

in every possible way. God Bless You! You remind me of a palm tree in a hurricane.

You stood your ground and bent till it hurt all at the time! You were so very remarkable.

I shall miss you and Harper so much. It is hard to find teachers like you. You were

exactly what my son needed.

Sunshine had endured a storm and came out of it standing tall. Sunshine had encountered

multiple storms, sometimes colliding all at the same time. Sunshine stated, "Paul had grown and

I have grown" at the same time. They met at a time in each other's lives when they needed

someone. Paul's mother had declared that Sunshine was what Paul needed and yet Paul was

exactly what Sunshine needed to survive the storm at her home. In the last meeting I had with

Sunshine, she told me about a curious a discovery she made in her back yard. Some time back

she had left a wheel barrel filled with a bit of soil on her back porch. On the day after school

was released for summer break, she noticed a plant growing in the wheel barrel. Upon closer

examination she discovered it was a newly sprouted palm tree. Sunshine smiled and left me with

this last statement, "Every time I look at that palm tree, which miraculously sprouted up out of

my wheel barrel, every time I see it, I think of him. And I will always think of him every time I

see one."

A school year filled with structural challenges, a home filled with personal challenges of

loss and caregiving, and a classroom filled with the biggest challenge of all, a possibility that

Sunshine might not be able to reach all students if she attended to the needs of one student, Paul,

who had demanded a lot of time and attention. Perhaps it was the passion that Sunshine had for

teaching to reach every student by whatever means necessary that offered her the strength she

needed to deal with the other stressors in Sunshine's life. For if Sunshine had to surrender the

belief system that she held so dear to her being and accept that sometimes she might not be able to reach everyone, she would have had to look deeper for other sources of strength.

In this case I presented a description of Sunshine, followed by a description of how this case was bound. With the symbolism found in the *Yin Yang* figure, I examined the interdependency of Sunshine's co-teaching relationship with Aubrey and her disconnect from the implementation of digital text. From the timeline drawing, I used Sunshine's illustrations to explore her journey depicting her struggles with implementing accessible technology and the behavioral issues of students. I reviewed her inner struggle with teaching strategies, the illness of her mother and the challenges that Paul brought to her fifth period class. I concluded the section through a parallel comparison of how both Paul and Sunshine were transformed due to their interaction with each other and how such transformation reinvigorated Sunshine as an educator. In the next section I discuss through a cross-case comparison the similarities and differences between Aubrey and Sunshine's experiences.

Cross-Case Comparison

This cross-case discussion reflects a comparison of the experiences of Aubrey and Sunshine documented earlier. I review the themes from each case and identify the salient ideas within. Finally I look for similarities and differences between the two cases. In conducting the cross-case discussion, I developed the following themes: a) Don't Call Me Special: See What I See; b) It's My Room: It's Not My Room; and c) Responding to Challenges and Change: It's Personal.

Table 3
Comparison Across Participants

Cross-Case Themes	Aubrey	Sunshine	Cross-Case Comparison
Don't Call Me Special: See What I See	Values system supports not calling students out by their disability during inclusion classes.	Supports not calling students out. Values how students view themselves. Wants them to see themselves as she does.	This value system is seen as an unwritten rule at Harper. This value and belief has been challenged by the accommodation of digital text for some students.
It's My Room: It's Not My Room	As a traveling special education teacher there is no space in an inclusion class that Aubrey can call "mine". Her space and influence is dictated by the gen ed. teacher she is assigned to.	As a general education teacher her room is her castle. The special ed. teacher that comes in to assist has to earn the right to own part of the space. But when they do, she grants dual ownership	The relationship between the general education and special education teacher is the key to the implementation of digital text. It is a make or break situation
Responding to Challenge and Change: It's Personal	Challenge and change began with resistance and ended with the personal motivation regarding her son.	Challenge and change knocked Sunshine to her knees and instructional strategies out.	Personal response to challenge and change directly impacted instruction in a negative and positive way

The above table demonstrates how the experiences of the two participants compare with each other within each thematic pattern. For example in the first row of the table, a theme is listed along with Aubrey and Sunshine's values in addition to the values supported by the Harper Campus. In the next section I discuss the comparative thematic patterns between Aubrey and Sunshine's experiences.

Don't Call Me Special: See What I See

As a first year teacher or a teacher's first year on a new campus, one of the first things a teacher learns quickly is the unwritten rule of the campus. Harper Middle School is no stranger

to this premise. When Aubrey came back after taking a break for a couple of years, she soon

discovered that there was an expectation to implement digital text in the form of text-to-speech

for those students who needed the support. Aubrey learned that at Harper teachers and staff go

out of their ways to ensure that students with disabilities are not treated different than their peers

without disability. The Harper staff referred to this at *not calling a student out* by their

disability. This rule applied to inclusion classes as well as self-contained resource classes. The

focus was to have high expectations for all students and treat them with respect while keeping in

mind their needs for specialized instruction. This expectation was passed down from one teacher

to another. It did not take Aubrey long to learn this cultural norm of Harper Middle School.

Sunshine and her co-teacher Aubrey valued this norm strongly and implemented this

norm in how they designed and delivered instruction. They applied this rule of not calling out

students to preserve the dignity of any student who had been identified with a disability or who

was in a specialized program. Aubrey and her supporting teacher celebrated the fact that I could

not differentiate the special education students from the 504, bilingual, ESL, or general education

students. During my observation of Sunshine's fifth period inclusion class I also had similar

difficulties differentiating student populations based on teacher interactions or specialized

instruction. With the exception of Paul, all students were expected to perform the same tasks.

Any accommodation or modifications were applied in the grade book. For example, Sunshine

required the students to write a research paper. During the writing process all students were

expected to turn in a topic, then submit a draft, and lastly turn in a final draft. While this is what

all students were instructed to do, some students would complete just the topic and draft, the

final draft was expected, however not required or calculated into one's grade unless it helped the

student's final grade. Sunshine had high expectations of her students, even of those students

with special needs, and did not see any need to diminish her expectations for students with special needs. She mentioned many times that all her students were special, some just a little bit more than others. Sunshine was referring to the students with disabilities being a bit more special. She wanted them to see their potential, as she did. She believed they all were blessed in different ways. Thus, both Aubrey and Sunshine valued in preserving the dignity of students with special needs and executed this value consistently in their daily practice.

However, the cultural norm of not calling a student out valuing their dignity was sometimes practiced in such a way that stretched the limits of the state and federal guidelines for inclusion and specialized instruction. There were students who had the accommodation of text-to-speech documented in their IEP but due to being singled out in the classroom the accommodation may not have been implemented. This became evident during my first interview with Aubrey as she described the process of using text-to-speech in a science classroom. She explained:

> We would usually go through whatever we were doing with the class. Then we would break apart for individual reading like if they were reading silently at their desk. I would come up to the student and say, "Would you like to use the computer?" "We have it orally on the computer where you can listen to it". I have some that will say no and some who will say yes. If they tell me "no I don't force them, they sit in the class.

In this example, students were given a choice in using the accommodation or participating in the assignment just as the general education students were doing. Regardless of the student's documented accommodation, the implementation was based solely upon the student's willingness to use. Considering the appropriateness of the accommodation was never spoken of or observed during this study even when it became difficult to extend accommodations because

of Harper's cultural norm. Harper middle school was in the early stages of implementing digital text in the inclusion classes with goals of identifying more students for this accommodation. The campus had not considered the appropriateness of accommodations for students. Rather the primary concern was with implementing digital text for anyone the campus staff felt would benefit from it. When faced with students' refusal or indifference, Harper's staff chose to align with the student's decision. The decision was more about not causing any situation that would call out or identify a student as having a disability even if it resulted in being out of compliance with the student's Individual Education Plan. Harper had become confident in their mission to implement digital text, however, the high occurrence of student refusals is cause for the re-evaluation of how it is implemented.

Both Aubrey's and Sunshine's need to follow Harper's cultural norms caused undue stress on their teaching. Both participants valued being able to reach all students. However, to align with the school's norm, something both the participants valued even before they were part of Harper, meant that both the participants would have discover some new ways of addressing their workload issues, dealing with the stress of not reaching all students, and working in some innovative manner to engage the students for whom accommodations were recommended. Aubrey and Sunshine were both able to transform themselves under the pressure of meeting a personal and cultural value and addressing diverse needs of their learners. Consequently, Sunshine learned how to manage her classroom better, work with students with special needs, and find ways to reach even the most difficult student. Aubrey learned how to be resourceful, attend relevant training, and identify ways to meet the accommodation needs for the students with disabilities without isolating them or further stigmatizing them.

It's My Room: It's Not My Room

I had shared with Aubrey an observation I made between herself and Sunshine during the fifth period class. I heard some comments made by Sunshine in reference to Aubrey's interactions with students. Sunshine commented that Aubrey needed to quit giving the students all the answers. This comment came as Aubrey went from group to group assisting with the writing assignment the students were working on. This comment was a fun banter between the two co-teachers but could be understood by an outsider as a tenuous moment. Recall, in this study the title *co-teaching* is used by the participants to describe the role or title of an *in-class support* teacher. I was assured by Aubrey and again by Sunshine that there were no ill feelings during this exchange. However, when I asked Aubrey if she had ever felt stifled by her co-teachers her short and immediate response was, "It's not my classroom". She paused for a moment and continued:

> I hate to say that in a bad way but you don't want to step on someone else's toes, and I think I do it in a joking manner because I know they're not going to take it as abrasive and I try but you know, these guys -- I'm a new teacher. I've taught private school, I've done ABA therapy, I've done -- but I'm out of my element and I don't want to step on anybody's toes and that's where I feel like, I mean, as a group of educators, whether it be in any district, I feel that, you know, they become close-knit, they become family like our students do and as soon as someone comes in, the last thing you want going around the water cooler is, oh, did you see what Aubrey did? -- She came in my room and started trying to run things and -- you know, I don't want to step on toes. It's not my classroom.

In one's own room one gets to make the rules, put up the bulletin board, design the lessons, and implement one's own instructional strategies. As the special education co-teacher Aubrey

usually did not have an input into any of these areas. Aubrey's schedule did not allow her to stay in most classes for any more than 20 minutes. During some class periods, Aubrey entered the class half way through and constantly felt that she was interrupting the lesson. She was the intruder to a space that did not belong to her. The implementation of digital text would depend on the general education teachers' willingness to take Aubrey's suggestions for accommodations. Some teachers listened to her and implemented Aubrey's ideas, but most would not allow her to become part of the team. There was one exception, and that was in Sunshine's class. In that class, Aubrey had more freedom to work collaboratively with the general education teacher than she had in any other classrooms. Aubrey could offer additional comments to rephrase an idea or topic that Sunshine introduced and at times would actually teach the lesson. As mentioned in an earlier section, there was a trust that Aubrey had earned from Sunshine that allowed her to have more involvement in the classroom. This was not something Sunshine extended to just any co-teacher. The personal relationship between Sunshine and Aubrey became to springboard to their success as a co-teaching team.

In previous co-teaching relationships Sunshine did not give share control with her co-teaching partner. Sunshine had described herself as "kind of an alpha" needing to be in control. She would also remark frequently, "It's my room," and being the teacher of record and controller of the content she felt justified in making that statement. In a conversation about working with co-teachers, I asked Sunshine if she needed her co-teacher to respect her vision for the class and students, she replied:

> I would like for them to. They don't have to, it's their choice. But it's my room. That sounds wrong. That sounds bad, I know it does, but you know, with co-teaching, you just can't co-teach with just anybody. You can't because it is, teachers are very controlling.

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Teachers are very, this is my classroom, my room my rules, so it's very hard. It has to be

a give and take. You have to respect each other and it's hard and I mean it is a true

relationship. It's not a working relationship. It is like a marriage and I mean, It's just

like being a mom and a dad and these kids play you like a mom and a dad and you have

to figure out you're on the same team and if you're not on the same team then it's

pointless to be in the same room together.

Sunshine knew that her words gave a negative impression, but it was her truth that she felt

needed to be expressed no matter how it made her sound. For Sunshine a co-teaching

relationship needed to be built on trust. If there was no trust or the ability to develop trust

Sunshine would not share her classroom. Sunshine demonstrated that she was willing to let go

of her need for control if she perceived that her class was in good hands, that her instructional

perspectives and educator values would be honored by the co-teacher. Once she trusted the co-

teacher to treat her classroom in ways that Sunshine would, she would begin to develop a

trusting relationship.

The relationship between Aubrey and Sunshine was immediately recognized as a trusting

co-teacher relationship. Aubrey would walk into Sunshine's classroom each day about 15 to 20

minutes after it had started. Aubrey would come in and start working with students or joining

the lecture as if she had been there from the beginning. There were days when Aubrey would

teach the class due to Sunshine's absence and the substitute became the support teacher. The

trust between this co-teaching team was vital to their success with students and the

implementation of digital text.

The implementation of digital text was an important accommodation for Sunshine's fifth

period class. There were two students who had this accommodation in their IEP for language

arts. Sunshine had been to training previously for software that provided Text-To-Speech support, however she chose to rely on Aubrey for the actual implementation within the classroom. Sunshine relied on Aubrey to implement this accommodation and strategy with her students, so much so that she could not identify what Paul was using to write. He made significant progress, however Sunshine was not aware of what exactly he was using because she had given complete control of this process to Aubrey. It was Aubrey who answered my questions about Paul's progress. During my last observation of Aubrey's teaching she was excited to share Paul's extraordinary progress. It was during this observation that I became aware of Paul's checklist and the tasks for using writing supports such as word prediction and a talking word processor. Aubrey had learned that if she told Paul to use the support he would refuse. However if Aubrey made sure the supports were open and ready to be used on the computer and remained silent, Paul would choose to use them on his own. That is how Paul began to write simple sentences and eventually short paragraphs. In the member check interview with Sunshine I asked her if Audrey had not been her co-teacher for this class or if she did not have a co-teacher would digital text be implemented as a support? She confirmed my perception in her response with a firm, "No". There was one thing she wanted to make sure I understood. That it was Aubrey's role to prepare and implement the digital text and writing support for the class. Sunshine would support the strategy but she did not feel comfortable enough with the software or conversion requirements to implement it on her own. Sunshine was aware that she had depended on Aubrey. She spoke with gratitude reflecting on Aubrey's support:

>Yeah, and I am, that's the god's honest truth, and let me tell you, she'll put me on her
>back if she has to. She's good.

There were times during this school year that Aubrey did just that. Sunshine's challenges within herself, her challenges with Paul interfered with her ability to teach on some days. It was Aubrey's support that helped kept the class moving and prevented Sunshine from breaking. It was not Aubrey's room, but as Aubrey took ownership of teaching when Sunshine could not when Aubrey genuinely co-taught with Sunshine, Aubrey made it her room too, perhaps a shared room between like-minded educators. Sunshine allowed Aubrey access to her classroom beyond her role as a fleeting, nomadic, special education teacher and made Aubrey a part of her teaching and learning environment.

The influence a special education co-teacher can have in an inclusive classroom is dependent upon the willingness of the general education teacher to listen, trust, and learn the strategies that assist students with disabilities. Likewise, special education teachers' understanding and knowledge of digital text and writing supports are essential for the implementation of digital text. This cross-case analysis demonstrates that neither Aubrey nor Sunshine shared the same relationship in other co-teaching arrangements. Aubrey could not develop the trust needed to be a more agentic teacher than one who never takes off her backpack with anyone else other than Sunshine. Sunshine, the self-proclaimed alpha female, with control issue could not share her classroom with others in the ways that she shared with Aubrey. Yet somehow their shared beliefs, values, teaching style and personalities became a complementary match and they were able to offer each other the support both of them needed.

Responding to Challenge and Change: It's Personal

Challenge and change are two issues that emerged frequently in Aubrey and Sunshine's experiences. Aubrey's change involved starting fresh on campus, entering an unfamiliar space as a new teacher, new to specific technologies and accommodations, and new to schedules,

routines, and changes made to them. Sunshine experienced changes when a new co-teacher was assigned to her classroom, when she had new students, when she had to work with the new students' reactions to learning, technology, classroom materials. Additionally, Sunshine had to adapt to the change in her classroom being painted. Each of these was challenging and stressful for both participants. How each participant responded to these challenges and changes has been detailed in the individual case studies.

Aubrey's journey to discover value in assistive technology documented many changes she encountered. Aubrey started with a vague understanding of her role on campus and learned promptly that what she knew as her daily routine could be changed quickly and with little warning. The campus expectation to implement digital text in the form of TTS and writing supports was not something that Aubrey had trained for before. While Aubrey resisted the suggestions from Lois to begin implementing and using the software in the beginning, she eventually surrendered and agreed to go to the recommended training. Attending this training would create additional changes in Aubrey's daily routine. She became excited about implementing digital text and returned to campus with this intent to begin promoting the use of her newly learned accommodation on campus. Aubrey was stressed due to the changes in schedule, supporting three content areas as a co-teacher, teaching her own resource class, converting files for accessibility, and dealing with resistance from teachers and students. Yet Aubrey carried on as she did not want to fail, which to Aubrey would have meant that she failed her son's chances of meaningful learning experiences since her son was identified as a child with Down's syndrome. Being the parent of a young child with Down's syndrome offered Aubrey an insight to her teaching that she had not experienced before. She viewed each one of her students as if it were her son, hoping he would have the same opportunities for inclusion. Aubrey

invested in the value of assistive technology because of the possibilities it gave to her students and hope for her son. Aubrey had opportunities to scale back her implementation strategies or the number of students using the software but she could not stop promoting or pushing students to use the software. Doing so would have been the equivalent to quitting on her son. Aubrey chose not to quit, but to flourish in hopes that someone someday would return the favor for her son.

Sunshine's chosen title for her case study speaks to the challenges of her experiences during this research study. Sunshine survived difficult experiences that felt like the perfect storm for her. She considered the survival an accomplishment itself and reflected deeply on the transformative nature of the challenges and changes that had on her understanding of herself, who she is as a teacher, as a daughter, and as a caregiver.

Sunshine started the school year on a high note. She was enjoying her class and the Smartboard®, classes were fun and lessons were engaging. Her biggest challenge and change emerged when her classroom was painted about halfway through the school year. The moment a decision was made to paint Sunshine's classroom, the structure and rhythm she had designed for her classes were lost. Gone was her Smartboard®, the organization of the classroom, and her desire to journal with the students. The medical challenges her mother was facing, the loss of the Smartboard®, and the painting of her classroom would become identified with the downward fall of her school year in her timeline graphic. For Sunshine these changes created the challenges she experienced during the school year. After losing a Smartboard® that Sunshine was familiar with, she was so disappointed that she was unable to navigate the technological aspects of a new Smartboard® installed in her classroom. Behavioral issues with Paul, a special

education student, arose about then. Sunshine depicted on her timeline drawing a self-portrait of being on her knees by this time, almost ready to surrender completely.

Sunshine shared that the external challenges were just amplified with her inability to deal with the unrest and the stress that she felt within. She expressed her stress associated with the challenges by using the new Smartboard® as a projector screen. She refused to engage with the new technology, much like her student Paul, who refused to engage with new approaches to learning. Sunshine's use of a technological tool as a white projection screen only demonstrates the fatigue she experienced due to the challenges and changes in her personal and professional lives. As Sunshine reflected on her challenges, she realized that the more stressed and frustrated she got, the more she lost focus of her passion for teaching and lost sight of key values she held as an educator. Similar to Aubrey, Sunshine did not want to lose a student. Reflecting back on her teaching history, Sunshine took pride in the fact that she had never lost a student and yet she was on the verge of not being able to reach all of her students, a reality with which Sunshine did not want to collide. Sunshine did not care about the accolades from her school as much as she cared about what she thought she knew how to do well – engage all her students in meaningful learning experiences. Eventually, focusing on what she valued, Sunshine gradually shifted from a state of frustration to a state of openness to identify alternate possibilities so that she would not have to lose a student. She decided to adapt to the changes instead of resisting them, in a similar manner that Paul did.

Challenges and changes in both Aubrey's and Sunshine's lives reflected how they integrated their personal beliefs and values into their professional roles. For Aubrey, not being able to adapt to changes, manage challenges would have been a failure not just for the students she was serving but also for the future possibilities of accessible education for her son. Aubrey

met with unmitigated changes, managed a demanding schedule, came in and out of classrooms where her value was mostly unrecognized, except for in one classroom, and learned new technologies despite her initial reluctance. While these challenges and changes can seem overwhelming at first, they were the driving forces for Aubrey's resourcefulness and innovative approaches to problem solving.

Similarly, Sunshine met with her challenges with resistance at first and eventually accepted the changes and began to manage her challenges with appropriate solutions. Sunshine's personal life distracted her tremendously from her role as a teacher and she became reliant on Aubrey to compensate for her absence. However, instead of perceiving the extra work as a burden, Aubrey began to draw strength from the trust that Sunshine placed in her and Sunshine in return began to gain the strength back to connect to her identity as a passionate teacher who reaches all her students.

It might not be surprising to read that both Sunshine and Aubrey handled their changes, challenges, and crisis in similar manners by stopping their resistance, accepting reluctantly the changes, remain open to new possibilities, reflect deeply within, find sources of strength and overcome challenges to identify stronger, richer ways to become effective in their roles. They would not complement each other as well as they did if they were not similar in their approaches to problem solving and if they did not value similar things as an educator. Perhaps if they were more different then they would have matched better with other co-teachers instead of each other. Yet, they did not. Instead both Sunshine and Aubrey created spaces for each other where their personal values were honored and where they supported each other to align with Harper's cultural norms.

Summary

Educators are faced with the challenge of designing and implementing instruction that reaches all students. Researchers, (Edyburn, 2010; Jackson, 2004) have asked if the daily demands of instruction allows educators the time and effort needed to effectively design instruction with UDL principles in mind. With the increasing responsibility of classroom teachers governed by state and federal law, to implement accommodations and support all students while maintaining rigor, the challenges faced by classroom teachers are immense. In addition to their current duties, they are offered limited support, training or planning time. Therefore, "as we probe new ways of increasing access to the general curriculum for students with disabilities, we will need to remain mindful of how teachers carryout their practices in real life contexts" (Jackson, Koziol & Rudowitz, 2001, p. 7). In chapter four, I have presented the findings from this study. I provided the description of the research site, an introduction to and description of the participants, and a TPACK profile for the primary participants, Aubrey and Sunshine. I have provided the reader with a detailed description of Harper Middle School culture and their history of implementing digital text in the inclusive classrooms. Next, I presented Aubrey and Sunshine's experiences implementing digital text, the challenges and struggles, as well as success stories in the form of case studies followed by a cross-case comparison.

CHAPTER 5: DISCUSSIONS AND IMPLICATIONS

As a special education teacher, instructional coach, and administrator for the last 21 years, I have known and have become aware administratively, of the challenges teachers face on a daily basis to implement legislative mandates and district procedures, while creating engaging accessible lessons. Regulation within IDEA 2004 state that student access to the general curriculum as well as provisions for Accessible Instructional Materials (AIM) must be provided to all students that need this accommodation within their instructional plan. My experience as a district administrator has increased my awareness of the challenges teachers face implementing AIM and Assistive Technology (AT) district wide. As my role shifted from the implementation of AT throughout the district to the implementation of AT into individual classrooms, I began to inquire how teachers were managing the expectations and mandates associated with their positions. This awareness motivated me to further investigate the experiences of teachers as they integrated digital text in the inclusive classroom which included students with disabilities. In chapter four, I presented the experiences of Aubrey and Sunshine as they implemented digital text in their inclusive classrooms. These two teachers were purposely selected based on a set of pre-determined criteria in order to provide an in-depth understanding of their experiences in the implementation of digital text. Grounded in the substantive frameworks of Technological Pedagogical and Content Knowledge (TPACK), and Universal Design for Learning (UDL), the following questions guided this study:

1. What are the experiences of the participant in using digital text in the inclusive classroom?

2. In what ways does the participant describe the various digital text resources they use in the inclusive classroom?

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Connections to Theoretical Frameworks

The theoretical frameworks for this study were based upon two substantive frameworks, Technological Pedagogical and Content Knowledge (TPACK) and Universal Design for Learning (UDL). Universal Design for Learning takes into account the nature of learner differences, capabilities of technology, and the most effective teaching practices and strategies to address the diverse needs of students (Meyer & Rose, 2005). Technological, Pedagogical and Content Knowledge (TPACK) is a framework to understand the knowledge and skills necessary for successful technology integration (Harris et al., 2009). In the following sections, I discuss the findings of this study in connection to the theoretical frameworks of UDL and TPACK.

Connections to Technological Pedagogical and Content Knowledge

As previously discussed in chapter two, the TPACK framework gives emphasis to the relationship between technological knowledge with solid pedagogical and content area knowledge. As Koehler and Mishra (2009) stated, effective technology integration around a subject matter requires attention to the relationship between pedagogy and content knowledge situated in unique contexts. The contexts of integrating technology in an inclusive classroom is unique in and of itself; however add the element of support staff with adequate technological knowledge but varying degrees of input into lesson design, and integrating technology takes on new dimensions. The participants selected for this study have provided the opportunity to examine the integration within their unique contexts.

In the beginning of this study I asked the participants to submit their responses to a TPACK survey in order to gain an understanding of where they were situated in regards to integrating technology, as well as the connection between technology, their pedagogical practices, and their content knowledge. The results of the survey were used to provide a TPACK

profile summary for each participant. These profiles were represented in chapter four in addition

to an adapted TPACK graphic (Figures 15 and 16) to offer a visual representation of the results

of the survey. I conducted interviews and observations with the participants over a four-month

period. I then returned to the participants for further clarification on data collected, accuracy of

interpretations made, and for verification of my hunches which extended the total duration of

interacting with the participants to six months. During the data analysis stages I began to see

discrepancies between the participants' TPACK profiles, my observations, and data collected. In

the following discussion I will provide a summary of the participants' TPACK profile, and the

original TPACK graphic while comparing findings gathered through observations and interviews

of each participant.

As per Aubrey's TPACK survey, she was confident in her ability to learn and use

technology in her lessons to enhance learning. Technology and pedagogical knowledge were the

areas she discussed with most confidence and content knowledge with least confidence. The

percentage of overlap of these three areas of knowledge was consistent and therefore provided an

alignment with her TPACK scoring and graphic (Figure15). The first impressions in my

observations supported the findings from Aubrey's TPACK survey. I observed Aubrey in the

various settings that she taught, which included in-class support classes, the language arts class

she shared with Sunshine, and her resource class. I saw her integrate technology, including

digital text, into the lessons she taught in her resource classes. Aubrey provided digital text files

for the science and language arts classes she supported, often spending considerable amount of

time converting files to accessible formats. Aubrey supported the use of technology through the

adaptations she made to class materials, test, or reading assignments. Her contributions allowed

for the course content to be accessible to all students. However, beyond providing accessible materials, she had little input on the lesson design or delivery.

When Aubrey's focus shifted to the inclusion classes, where she would co-teach or offer in-class support, her integration of technology was limited by the lesson design of the general education teacher. Aubrey was scheduled in the science and social studies classes for a minimum of 15 to 25 minutes per class period. This time frame did not allow Aubrey the opportunity to plan with the general education teachers or have input into the lesson design or delivery. Also observed was a reduction in the use of technology in Aubrey's resource class during specific times of the semester. When Aubrey had annual reviews of students Individual Education Plans (IEP), progress reports, grades, and other campus documentation due she often discontinued the use of technologies in her resource class so she could put her attention on the administrative tasks. Teachers have a responsibility when using technology in the classroom. Students must be observed and monitored during the usage of technology to ensure guidelines are being followed. Aubrey found it difficult to monitor the students closely and still meet the administrative deadlines she faced. To manage her administrative tasks, Aubrey discontinued the integration of technology and reverted back to paper pencil tasks. Therefore Aubrey chose to discontinue the use of technology to meet the needs of her administrative tasks. Essentially this move eliminates the Universal Design for Learning principles of multiple means of representation, action, and engagement from her lessons. In addition, Aubrey's lack of involvement in the general education lesson design resulted in a reduced relationship between technology integration and the pedagogical aspects of the inclusion classes (Figure 30). Thus the relationship between technological, pedagogical, and content knowledge, the center of the TPACK diagram, had become diminished even though there remained a weakened connection.
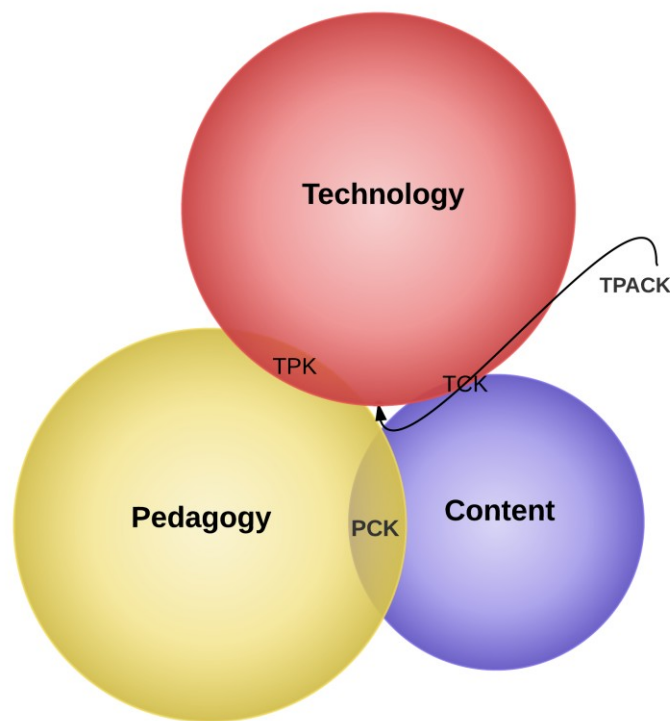
Figure 30. Aubrey's TPACK representation after data analysis

It is important to note that the change in relationship within the TPACK model was not a consistent position for Aubrey. During the majority of the semester Aubrey's TPACK relationship between the individual components was strong. She integrated the use of digital text and writing supports with the use of the Smartboard® thus creating engaging lessons for her students. However, as the challenges and stressors would arise and fade, the integration of technology in her resource course also fluctuated. The integration of technology in her in-class support and co-teaching classes remained dependent upon the general education teachers' lesson design, thus compromising the relationship between the TPACK components. While Aubrey had adequate knowledge to provide a technology rich classroom, the lack of input into the actual lesson design, her willingness to discard technology in stressful times, weakened her ability to use technology integration to make an influence on student achievement.

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Unlike Aubrey, Sunshine was a general education language arts teacher with her own room and the responsibility to design and implement lessons. Recall Sunshine's TPACK profile highlighted her ability to learn technology easily, solve her own technology problems, and use technology skills to implement and use technology in the classroom. She was able to use a literary way of thinking and employed various teaching approaches to guide students' thinking in the areas of literacy. In her TPACK graphic in chapter four (Figure 16), pedagogical, technological and content knowledge had a strong relationship with pedagogical knowledge scoring the strongest. The combinations of the three areas of knowledge also had a strong relationship. The first time I met Sunshine I was impressed by her enthusiasm to learn how she could use text-to-speech software with her Smartboard® in her class. It was not until I visited her classroom for the first time that I learned about Sunshine's experiences with the Smartboard®. As detailed in Chapter four, Sunshine had started the school year with one model of a Smartboard®, which was interactive to the human touch, and later replaced with another model that depended upon a stylus to become interactive. This change was the beginning of the Sunshine's challenges with the Smartboards®. As I completed my observations, I realized that Sunshine had not been able to make the shift from her first Smartboard® model to the other. Because of her inability to learn the functions and process of interacting with this new Smartboard®, the board was nothing more than a projection screen for showing PowerPoint presentations. I had offered to assist in finding her some training for this Smartboard®, however, all I was able to assist with was the user's manual for her new model. It was not until the end of the school year when she attended Smartboard® training did she speak in a positive way toward the current board in her room.

During my observations in Sunshine's classroom the only technology use by students, other than Paul's use, was when the students would use a word processing program to write research papers or complete a worksheet. Paul, a student in Sunshine's class, was at the computer on a daily basis this was one of the intervention strategies on his IEP. There were times when students would be sent to the library or Harper's Ferry to complete assignments using text-to-speech or other writing supports. In my observations I did not witness Sunshine interacting with students' technology or accommodations. This task was given to her co-teacher to implement. When students would resist going to Harpers Ferry, to de-escalate the situation, in an attempt to not draw attention to the student's disability, Sunshine would offer a choice in assignments, which at times did not include the use of digital text. Sunshine also reported that she altered her lesson plans by not asking students to journal in class. Sunshine had stopped her journaling activity, which had been included in her original plans, after she learned of her mother's dementia. Sunshine had high expectations of teaching, if she asked the students to journal during class, she deemed it necessary to model the same act and journal herself with the students. Yet, due to the stress she was going through with her mother's illness, Sunshine could no longer journal with the students without becoming overwhelmed with her emotions. This was not acceptable to Sunshine, therefore, her only choice was to discontinue the journaling activity in her classes. The changing of the Smartboard®, her hands off approach to accommodations, and the discontinuation of classroom journaling weakened the relationship in Sunshine's TPACK model. Figure 31 is a representation of the observed relationship in Sunshine's TPACK model. The change in assignments when students resisted and
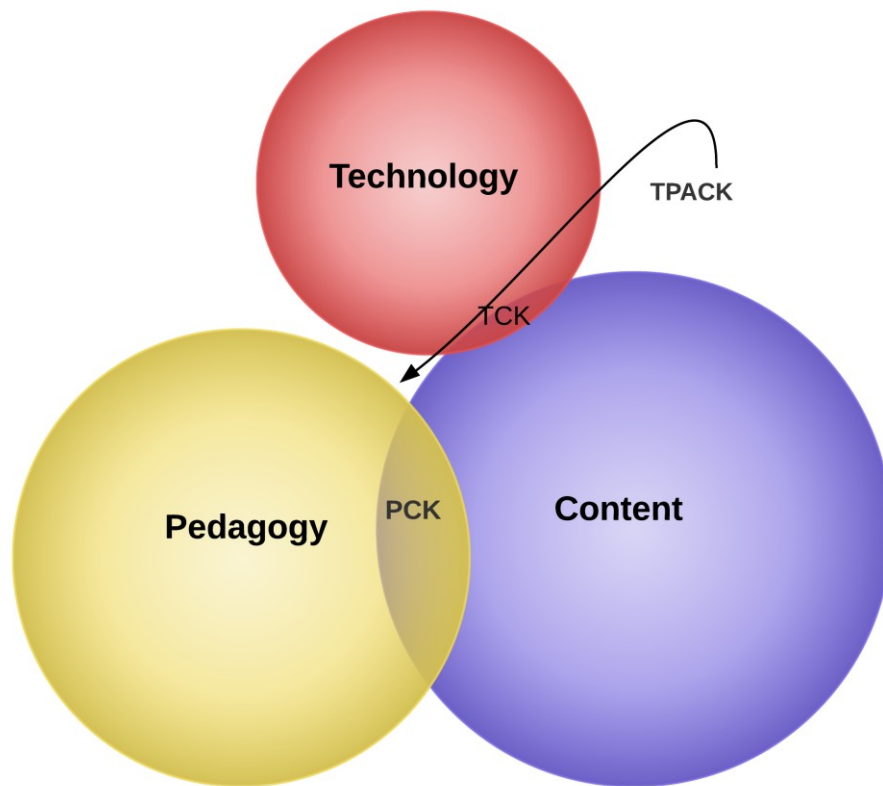
Figure 31. Sunshine's TPACK representation after data analysis

the altered expectation of journaling resulted in a noticeable change in the relationship between

pedagogical knowledge and technological knowledge as well as a weakened relationship

between pedagogical and content knowledge. Due to the use of the Smartboard® as a projection

screen for Sunshine's PowerPoint presentations I demonstrate a small relationship between

technological knowledge and content knowledge. In this representation there is no symmetry

between all three areas of technological, pedagogical, and content knowledge. Like Aubrey,

Sunshine's TPACK representation is not a constant position or representation of her sensibilities

and performance. Rather, in my observation, this representation is a temporary position due to

the extreme nature of challenge and stress Sunshine endured during this study. The pressure of

classroom changes, student behavior, and her mother's illness affected Sunshine's ability to

teach with the knowledge she possessed. It is important to note that through all the struggles,

Sunshine revisited her belief system about new technologies and gained new knowledge of her

abilities.

The teaching relationship between Aubrey and Sunshine during the one inclusion class

that they taught together was discussed in chapter four. Their roles on campus were different

and independent of each other except for the one class period they shared together. In this class

there was interdependency between the two participants that allowed the strengths from both

participants to come through. As mentioned in chapter four, there were times that it seemed they

moved as one unit. Whatever one person lacked the other would make up the difference. This

same relationship is also seen within the observed TPACK profiles from both participants.   As

Sunshine struggled with the behaviors of Paul, the effects of her mother's illness, and the

struggle within herself, she lost her ability to design lessons and activities with the TPACK

knowledge she had expressed confidence in earlier. Aubrey and Sunshine shared the value of

not calling students out by disability and not losing a student. In their efforts to reach Paul, a

student with disabilities, Aubrey would lean on her strengths and support the technology side of

the intervention instructional strategies.   She prepared Paul's designated folder each day with

the digital files he needed and the visual reminder to use the writing supports available.

Sunshine contributed the content in the lessons Paul would access and the class discussions and

Aubrey made it accessible for Paul. She supported Paul by implementing the technology he

would engage in and eventually use to expand his writing. It was through the combined efforts

that the co-teaching relationship they had developed worked for Paul's success. Figure 30 shows

the combined TPACK relationship of Aubrey and Sunshine. This representation has combined
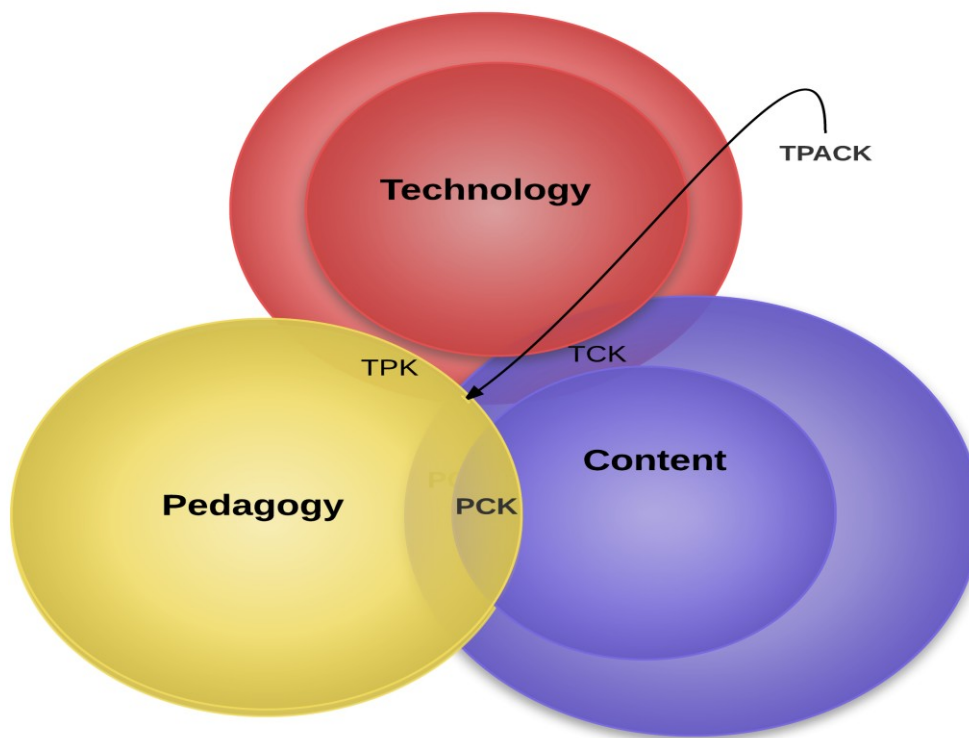
Figure 32. Combined observed TPACK profile for Aubrey and Sunshine

the observed TPACK profiles of Aubrey and Sunshine (Figures 29 & 30), to represent the

practice of their TPACK confidences when working together. Aubrey and Sunshine shared a

similar confidence in pedagogical knowledge but differed in their confidence in technology and

content knowledge. However, as shown in Figure 32, when working together their individual

strengths contributed to the overall practice and integration of digital text in the classroom. In

this representation there is an element of symmetry between all three areas of technological,

pedagogical, and content knowledge. The interdependency of the co-teaching relationship

provided the context within which Aubrey and Sunshine were able to integrate digital into the

inclusive classroom.

The TPACK model focuses on the evaluation of teacher knowledge in the areas of

technology, pedagogy, and content within the context of where teaching and learning is to take

place. The TPACK profile developed after Aubrey and Sunshine completed the initial survey

communicated a certain level of confidence within the TPACK knowledge areas. However,

these profiles while independent of each other, did not represent the perfect symmetry of the TPACK Venn diagram as provided by Harris et al. (2009). When Aubrey and Sunshine's observed profiles were combined the integrated TPACK, the Venn diagram showed a closer symmetry instead of their individual contextual TPACK profile. Therefore, it seems that the TPACK survey represented an idealized profile for the participants which were not the same once the participants had to deal with their individual contextual details in their personal and professional lives. However, when the two participants worked together they compensated for the lack of symmetry in the individual TPACK circles and were able to collaboratively create a balance between all the components of the TPACK model. It can be argued that the relationship that Aubrey and Sunshine had contributed strongly to the ways in which they balanced each other and how they approached technology integration. The TPACK model makes provision for context and the findings of this study emphasize the critical role of the context in which technology-integrated learning occurs in an inclusive classroom and/or by extension, any classroom. The findings also support strongly for all the components in the TPACK model to be balanced as represented by a perfect symmetry of the circles representing the component in the Venn diagram of the TPACK profiles (Figures 15, 16, 30, 31).

To maintain the perfect symmetry between the circles as represented in the TPACK Venn diagrams, the teacher's skills need to be nurtured so that s/he can feel supported to negotiate personal and professional issues in her life. These personal and professional contexts affect the ways in which teachers express their confidence in technological, pedagogical, and content knowledge. Teachers' personal experiences and issues, difficulties with co-teachers, relationships with students with disabilities, barriers to the curriculum, understanding and navigating the law and personal values are all contexts in which instruction is affected and thus

the symmetry of their TPACK profile affected. When the context of the teacher personal experiences interferes with the context of teaching and learning, the TPACK diagram is no longer symmetrical in its appearance. This implies that the context of personal belief, family information, actions, and relationships with existing teachers are essentially the key aspects of keeping the TPACK diagram symmetrical. This study contributes to the understanding that the experiences and attitudes of teachers, not solely the knowledge they possess, are the contexts in which TPACK can have perfect symmetry. The findings in the study support the need to give attention to the relationship between technological, pedagogical, and content knowledge in the context of the daily experiences and challengers of classroom teachers.

Connections to Universal Design for Learning

In chapter two I discussed in detail the framework of Universal Design for Learning (UDL). Universal Design for Learning provides the blueprint for designing inclusive classrooms that provide materials and methods that accommodate the curriculum for diverse learners (Hitchcock & Stahl, 2003). Effective teaching is not made up of one particular method or strategy, but rather as Meyer and Rose (2005) claim, the specialized knowledge teachers' possess that enable them to focus on the complex learning needs of all children. In this study I observed and interviewed two teachers as they attempted to implement digital text in their inclusive classrooms. I became aware of the limited knowledge the participants had of UDL and the instructional methods that could be supported through UDL strategies although they showed desire to implement strategies that were consistent with the UDL principles. In the following sections I discuss the connections between the participants' experiences using instructional strategies that support the principles of Universal Design for Learning.

Multiple Means of Representation. Recall that this principle of UDL is grounded in the assumption that all learners process information and interpret information in varying ways (CAST, 2011b). The challenge of teaching students with learning disabilities requires teachers to alter their methods of teaching in order to make content accessible for all students. For Aubrey, this included all the teachers she supported throughout her daily schedule and for Sunshine this included her seventh grade inclusion class. She integrated varied instructional materials into her resource classroom as well as in her classroom materials that she had altered for general education teachers she supported. I observed Aubrey as she assisted the general education teachers in the lesson delivery. Aubrey was unable to be involved in the planning process for many of her classes. However, in her attempts to clarify and rephrase information, she was fulfilling the tenets of the first principle of UDL. While she was not the one that designed the lessons, Aubrey would involve herself in the class discussion and interject during class lectures when she felt students were disconnecting from the learning process. Often these discussions and interjections would be questions she assumed students were asking but would not speak, or the clarification of a multistep process that may have become overwhelming for some students. For example, during one of my observations in Sunshine's class, as she was giving her lecture on the Greek gods Aubrey would ask questions regarding the symbols or items that Sunshine had paired with each god in her slide presentation. The symbols or items presented were intended to offer background information or a connection to the key meaning assigned to the Greek God. By providing the same information through different modalities Aubrey provided multiple means of representation.

On the other hand, Sunshine's struggle was of a different nature. Her seventh grade inclusion class was challenging. This was primarily due to one student, Paul, who presented

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Sunshine with some of the most challenging behaviors she had ever seen. As mentioned in

chapter four, Paul would position himself in the same chair in front of the classroom at the

computer each day. Sunshine would have his designated checklist folder accessible for him,

another folder on the desktop computer with his assignments, and other text files for him to use if

needed. In all of my observations, Paul was seated at this computer with headphones on and

listening to *Green Day* while working. Sunshine did not realize that she adapted Paul's

instructional strategies in a way that allowed him to access her lesson and gain from instruction

more than he ever had. This became apparent during my second observation. I was seated in the

back of the classroom while Sunshine lectured on *Greek Mythology*. The lecture was engaging

with stories and images provided for students to connect their understanding. There was one

slide in her PowerPoint that was not easily read from the students' desks, a diagram of Zeus'

family tree. She called all the students up to the front to stand around the Smartboard® to read

what was on the slide while she continued to lead the discussion. As she discussed Zeus and the

many genealogical lines that he was listed on in the family tree she asked the class why Zeus was

listed so many times. A voice was heard from outside the circle of students. It was Paul who

answered Sunshine's question. Paul answered, "He fucked around a lot". Paul's response was

not expressed in the appropriate language for a middle school classroom. However his

understanding of the situation was correct. Paul had a limited view of the PowerPoint slide and

could only hear the discussion over the sound of the *Green Day* music. No one expected Paul

was even paying attention, but he was. As Paul responded, Sunshine first corrected his language

but acknowledged that he indeed was correct. What Sunshine did not understand until this very

moment was that through the accommodations and adaptation to her teaching strategy, she had

provided Paul with the means access the curriculum that addressed his unique needs while remaining in a general education classroom.

In UDL multiple means of representation calls for three broad ways that teachers can provide options. Teachers are called to provide options for perceptions, language, mathematic expressions and symbols, and comprehension. It became evident that Aubrey and Sunshine continually strived to provide these options to their students. Aubrey provided options by altering the way in which Paul's assignments were presented to him. She would give visual rather than oral directions, give him space to engage in his learning in the way that he learned best. Sunshine created options by providing Paul with the technology that promoted engagement and altered the ways in which Paul would comprehend the material and express himself in class. The level of engagement and commitment of the teachers, to reach one student, with unique needs, was often at the expense of the whole class. In reflecting upon the personal values, beliefs, and assumptions of Aubrey and Sunshine, it was clear that teaching was not about getting most of the students ready for the next step, next high stakes test, but it was about reaching all students. For this reason, both Aubrey and Sunshine employed multiple means of representation so that they were able to reach all students, even the one who appeared to be listening to his own music and not pay attention to the instruction. In the next section I make connections between the second principle of UDL, *Multiple Means of Action and Expression* and the experiences of Aubrey and Sunshine.

Multiple Means of Action and Expression. This principle is based on the premise that learners differ in the ways in which they navigate their surroundings and express what they know (Rose & Gravel, 2010a). The challenge teachers face in teaching a diverse population of students is the need to provide alternate strategies for acting upon and manipulating information

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(CAST, 2011b). This principle calls for students to be given options for physical action, expression and communication, and executive functioning. Giving opportunities to act upon their learning through role-plays, music and dramatic representations are a few ways teachers can provide options. Teachers can also provide options through advance organizers by building in multiple means of expression and communicating those options to the students.

In Sunshine's seventh grade language arts class, I noticed Sunshine's demeanor had changed. This was the most frustrated I had ever seen her. She was completing a series of lesson on persuasive writing. Students were working in groups on a paper to support or not to support the city's proposed ban on plastic bags. The groups had been working on this project for three class periods and were in the final stages before writing their papers. Each member of the group had previously been assigned a section to work on, however none of the groups seemed to understand how to do the assignment. Frustrated by the lack of effort her students was giving to this assignment, Sunshine changed her strategy by providing each student with a 3x5 sheet of paper (which she made by tearing copy paper into four sections just minutes earlier) and divided the responsibilities again. Students were given the choice to submit a PowerPoint, create a poster, or document through video clips the groups' stance on the issue. This time she helped outline each member's responsibility, giving the students an optional way to manage and complete the assignment.

Another instructional strategy that both Aubrey and Sunshine worked to implement with Paul was the use of the folder, which contained the checklist of assignments and other instructional supports. This had provided the option for executive functions to assist Paul in his daily routine. While the strategy took a long time before Paul responded appropriately, it proved to be the support he needed to be successful in Sunshine's class.

The above examples are directly aligned with multiple means for actions and expression as Aubrey and Sunshine provided these options through physical action, expression and communication, and executive function. Sunshine's frustration with her students' performance inspired her to think of options for expression, communication of what students learned via the executive function of organizing task and allocating students to a certain task. Aubrey provided options for expression and communication by incorporating the visual strategies she used with Paul. She altered her communication mode so that Paul was able to communicate both expressively and receptively. Paul accepted the use of his checklist to complete tasks and to communicate what was finished even though at first he resisted doing so. Aubrey's strategy to provide nonverbal directions allowed Paul to receive communication in a manner in which Paul could comprehend the expectation and reflect on his decision to follow the directions. Sunshine provided options for the executive functioning by providing Paul with the folder system and the organizational methods for him to access his curriculum.

Thus, in the examples above as well as in the narratives documented in chapter four, there seems to be evidence to suggest that both participants continuously remained flexible in terms of their instruction, approaches to think about tasks, integrating multiple modalities of learning, and ways to use pedagogically-driven technology that remained accessible to all students. In the next section, I make connections between the participants' experiences and the third principle of *Multiple Means of Engagement*.

Multiple Means of Engagement. This principle is based on the foundation that learners differ in ways that they become motivated and engaged in learning (CAST, 2011b). The challenge teachers' face when working with the varied needs of students is to conceptualize strategies that engage and motivate students' desire to learn. Universal Design for Learning

offers guidance on how to provide options for instruction that encourages student involvement, self-regulation, and prolonged engagement (Pisha & Coyne, 2001). Giving consideration to the student's background, disabilities, and culture are ways that teachers can adjust the learning environment in order to promote engagement. The use of technology-based learning can provide the options students need to engage with the lessons. As discussed in chapter four, Sunshine's personal inner struggle, regarding her teaching methods, resulted in the acknowledgement that Paul needed visuals and the use of the computer to become engaged in her class. When Sunshine changed her strategies and allowed Paul to sit at the computer in front of the room, when no one else could, it provided the option for Paul to connect to the content and gain understanding. In the example from the previous section, Paul appeared to be sitting at a computer disengaged from the lesson. However, in my observations, Paul was engaged and motivated the best way he could which allowed him to be attentive to his surroundings. Listening to *Green Day* and trying to concentrate would be impossible for me, however, this process helped Paul focus and sort out all the distractors in his environment. These strategies provided Paul the options for sustained effort, persistent learning, and self-regulation.

Learners differ in the ways that they engage and become motivated. Therefore, teachers cannot offer only one option for students to be involved in the lessons (Rose & Meyer, 2002). Just as technology was the answer for Paul, Sunshine and Aubrey had other students that were reluctant and refused to use technology in the classroom. During these moments Sunshine and Aubrey offered alternate options, thus providing choices in how students wanted to engage in their learning. Students were given the choice to present assignments in various ways, including the use of technology. They were also allowed to choose the environment where they could access the digital text files for their assignments. For instance, Sunshine needed students to use

the digital text in the classroom but that would isolate the students who had disabilities. Selecting some students to go to Harper's Ferry to access their book with the text-to-speech software was not something the students liked because it was still too stigmatizing for the students with disabilities to be singled out with a few other students to go to Harper's Ferry. As a solution, Sunshine decided to send a diverse group of students, some served through special educations and others who were not, to Harper's Ferry together so that it was difficult to identify the reasons for every student's presence at Harper's Ferry. Sunshine would alternate groups in her class, where she would expect each group to attend Harper's Ferry for assistance as a typical learning experience for all students and not just for the students with disabilities. This strategy provided the accommodations that the students with disabilities needed without being vulnerable to stigma or being singled out due to their needs. All the options were made available in the attempt to reach all students by engaging them in their learning. Aubrey's experience was different in that when students resisted the option to use digital text in the inclusive classroom, she allowed them to reject their accommodation in order not to draw attention to the student. Yet, Aubrey was legally obligated to provide accommodation for these students. These findings suggest that while technology can be a way to engage a student, it is not the solution for all students' learning issues. Nor can any strategy be universally applied. Therefore, conscientious teachers are constantly changing their strategies, exercising flexibility to remain connected to their students' learning experiences.

Multiple means of engagement calls for three broad ways that teachers can provide options for motivation and engagement. Teachers are called to provide options for recruiting interest, sustain efforts and persistence, while allowing students to self-regulate their emotional reactions to learning. Aubrey and Sunshine dealt with students with disabilities who were placed

in inclusive learning environments with accommodations provided. These accommodations included the use of digital text to access the curriculum. Aubrey and Sunshine provided options for engagement by offering choices in how assignments were completed, altering the environment in which students received instruction or their accommodation, and being receptive to students' personal choices regarding their accommodations. These options provided multiple means for engagement and motivations.

Connecting the experiences of the teachers with the frameworks of TPACK and UDL demonstrates that the two participants were extremely committed to ensuring that students with disabilities received access to the curriculum with the supports needed for success. In so doing the participants not only followed the mandates of IDEA 2004, but they carried out the spirit of IDEA 2004 in their practices. The participants were not just motivated to provide options for the students, but they were committed to teaching every student and demonstrated such commitment through the tenacity it took to implement the strategies and accommodation that connected the curriculum to the learners. Aubrey and Sunshine provided Paul with his designated folder as a teaching strategy long before he finally accepted and engaged in its implementation. While both the TPACK and the UDL frameworks provide a lens to understand technology-integrated pedagogy-driven engaged learning, findings of this study strengthen the conversation by reinforcing the critical role teachers' personal beliefs, values, attitudes, and assumptions play in creating a learning environment that is grounded in the tenet, *at whatever cost,* meaning that a teacher cannot quit on any one student, even if it is weighed against the good of the many.

Connections to Literature

There is empirical evidence that suggests that while technology can be a vital asset to student learning, technology-integrated approaches that lack proven pedagogical foundation is

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ineffective (Higgins, 1996; Ko et al., 2011; Twyman & Tindal, 2006). Sunshine's experience with the new Smartboard® supports such claim. Sunshine was overwhelmed by this new technology and therefore had not explored pedagogical foundations to integrate a tool that she herself did not understand or value. Thus, her instruction morphed from the previously engaged pedagogy-driven learning environment. No longer did she have an interactive, motivating and engaging lesson design. Her lessons reverted back to traditional presentation style lecture. This change in Sunshine's instructional strategies reinforce Twyman and Tindal (2006) findings where they stated that the presentation of digital text alone is unlikely to have an influence on improving reading comprehension or motivating students. Rather, students need instruction in content specific knowledge teamed with technology, such as multimedia, interactive software, and reading supports to improve student knowledge acquisition and comprehension (Boone et al., 1993; Stetter & Hughes, 2010). In other words, Sunshine's presentation of digital information without pedagogy, without her own buy-in, without student engagement and motivation created an environment where learning was not effective as it was before for Sunshine when she was pedagogically grounded.

Additionally, turning students loose on digital text and other technologies will not enhance or guarantee robust learning (Shapiro & Niederhauser, 2004). In one instance in the study, without appropriate availability or use of new accessible digital texts, Aubrey made a decision to create digital versions of her files, assuming that they would be similar to professionally developed digital texts. Aubrey made extensive efforts to scan and convert files to accessible formats in question. This practice was in alignment with compliance mandates, however, was not driven by pedagogy and had little to no chance of reaching students, nor create meaningful, motivated engaging learning experiences. In many instances student simply refused

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to engage in the use of digital text. In the right circumstances, Shapiro and Niederhauser (2004) maintain that digital text can be enhanced by presenting text in environments that offer opportunities for students to connect through pedagogically grounded instruction. The integration of technology in pedagogically grounded instruction is the foundation for increased student learning and knowledge comprehension. The above findings support the successful integration of technology driven by pedagogy to improve student learning, engagement, and motivation. While calling for pedagogically grounded technology-integration is not a new idea, expanding this conversation to digital text, accessibility, and meeting learners' needs in high stakes testing environment raises the issue of resources, training, and calls for conversations around the stress educators feel when they are overloaded with these expectations. Certainly no one will argue that technology-integration for the sake of introducing technology without pedagogical grounding is a great idea. Yet, how are educators supposed to create time in their schedule when they are already overwhelmed with their existing responsibilities, stay after school to help students, do their paperwork on their own time frequently, and still remain accountable for unpredictable changes in technology that call for new ways of thinking about pedagogy with limited time and support available? Therefore, while these findings support the widely accepted convention of pedagogy-based technology integration, these findings extend the conversation further in terms of the implications of such ideals within the social and political structures of education where it is mostly the teachers who are held accountable for all things related to teaching, yet they are the last ones to be consulted about effective teaching practices and what support they might need.

Teachers are the principle stakeholders and ultimately the essential element for successful technology integration (Bitner & Bitner, 2002; Edyburn, 2010; Loveless et al., 2001).

Researchers have also noted that an authoritative, teacher-centered lesson design is the typical method of instruction as opposed to learner-centered design (Cuban et al., 2001; Semple, 2000) in public education. Before having Paul in her classroom, Sunshine positioned herself as the sage on the stage. However, as her challenges with Paul increased, Sunshine had to re-evaluate her teaching strategies and shift from being an authoritarian educator to being a student-centered one especially driven by her need to not lose a student. This need was the driving force behind her decisions regarding her lesson design and accommodations for Paul. Circumstances influencing teachers' preferences and decisions regarding lesson design have been related to the beliefs and personal theories teachers hold about learning, technology integrations, and lesson design (Pajares, 1992).   Sunshine struggled immensely when she had to move away from her familiar traditional methods to unfamiliar accommodations that were necessary to implement for Paul's educational success. Ultimately her value to reach Paul trumped other issues and prompted Sunshine to adjust her lesson design.

Other research has suggested that the challenges faced by classroom teachers interfere with teachers' abilities to implement technology consistent with their knowledge and training (Anderson et al., 2011; Edyburn, 2010). Aubrey's experiences as a new teacher to the Harper campus support these findings. The teaching schedule that Aubrey started out with changed, new responsibilities were added and the pressure to implement digital text was strong. However, due to the newness of her position and the confusion in her teaching role, Aubrey ignored the pressure to implement digital text initially. Also, Sunshine's decision to discontinue her journaling activity supports these claims as she abandoned this activity being unable to deal with the stress in her personal and professional life. Sunshine stated that this was, "the most difficult year she has had yet", the struggle with Paul, the Smartboards®, and her mother's illness and her

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inner struggle had taken Sunshine to a breaking point. While the findings support the established

literature on challenges interfering with teachers' ability to implement technology, they also

extend the conversation by introducing other issues that remain barriers to effectively

implementing technology to create accessible materials and deliver instruction to meet diverse

needs of learners. These issues center around the reasons why educators feel stressed in their jobs

and the contributing reasons for that stress, a stress so overwhelming that an educator drew a

picture of being brought down to her knees, equating teaching experiences to a perfect storm,

and another one started taking color out of her experiences to depict stress in her job. True it is

critical to meet the needs of a diverse group of learners, but teachers are a diverse group as well

and unless they feel that they are heard, understood, and their needs are addressed, the longevity

of a teacher's career would be cut short, and contribute to high turnover and burnout in public

education. Being able to meet teachers' instructional needs, create working environments where

teachers feel that they are able to perform their best without being an almost broken palm tree

enduring a perfect storm is one of the key elements of creating accessible environment, are issues

raised by the findings of this study raise for further evaluation and conversation.

Exploring the evolution of teachers' beliefs on learning and technology, Levin and

Wadmany (2006) studied how teachers use of technology and information rich tasks influenced

their views on learning, teaching, and practice. For example, in chapter four I shared Aubrey's

experiences as she found value in assistive technology. Aubrey resisted learning a new

technology and instructional strategies as her campus had suggested. However, once she had

been trained and experienced the software, she could see the potential influence the technology

could have on her students and her son. With this new knowledge she was quick to change her

teaching and practice. The findings of this study support the discussion and implications of

Levin and Wadmany (2006), that belief systems are dynamic, changing and restructured when individuals are open to evaluating their own beliefs. Both participants in this study experienced moments of change in personal beliefs during the course of this study. The confidence Aubrey gained through her growth enabled her to redesign her role to showcase her new passion and belief. She continued to struggle at times, however she held onto the value of her belief to move forward. Sunshine's continued reflections on her teaching practice, how she could reach students, how she needed to revisit her own attitudes also support the dynamic nature of attitudes and beliefs and reflecting on such beliefs especially when learning and implementing continuously evolving technology for a group of students who have diverse needs. In addition, Levin and Wadmany (2006), also demonstrated that educational change involving the use of technology is an individual process. Aubrey and Sunshine both experienced educational and personal change during this study. As Aubrey redesigned her routine to include the integration of digital text, she changed her educational approach in working with students with disabilities. Sunshine experienced personal and professional change as she struggled to put her traditional methods of teaching behind her. However, Aubrey and Sunshine also experienced educational growth together through their educational change and success in working with Paul. The changes they each experienced in their approach to Paul could not have occurred separate from each other. Aubrey and Sunshine combined their strengths to provide Paul with the instructional strategies that enabled his enhanced learning.

Looking forward, continued research is needed in the use of assistive technologies that target the characteristics and needs of students with disabilities, taking into account the attitudes, beliefs and intentions of experienced teachers, and explore options for providing the support and resources needed if teachers are expected to create shifts in the attitudes and beliefs, and by

extension in their curriculum preparation, instructional design, and delivery. By discussing the attitudes, beliefs, and intentions of teachers as they integrate assistive technology for specific student's needs presents the possibility for more dialogue into teachers' practices of integrating technology for students with disabilities.

Conclusions

In this study I wanted to gain a deeper understanding of the experiences of teachers as they worked towards integrating digital text as accommodations in their inclusive classrooms. The purpose of this research was to identify how two teachers in inclusive classrooms located in South Texas, describe their experiences using digital text for students with learning disabilities. The research questions explored the participants' experiences using digital text in an inclusive classroom as well as explore how participants' describe the various digital text resources they use.

The struggles, successes, and meanings discovered in this study have shown that the participating teachers felt deeply about their duty to fulfill the needs of all students. In chapter four I discussed the findings of this study and the experiences that Aubrey and Sunshine shared with me. Both participants were from the same campus however, their experiences are quite unique. Aubrey provided her experiences from the perspective of a special education teacher serving as a resource teacher, in-class support teacher, and a co-teacher. Sunshine provided her experiences from the point of view of a general education teacher with experience working with co-teachers. These perspectives added a unique aspect to the findings. I was able to gain a deep understanding of their experiences integrating digital text as well as their experience working with another teacher to implement digital text.

Exploring the experiences of Aubrey and Sunshine through the culture of the Harper campus to implement digital text allowed me to understand the support system that was provided to the participants. Digital text was not an accommodation that Aubrey or Sunshine chose to implement on their own. The Harper campus had specific expectations that their teachers would integrate and support the spread of digital text use throughout the campus. This expectation was supported by the principal, assistant principal, and instructional advisor. There were times when administration would caution the staff to carefully consider which students were given the accommodation, not to act as a barrier but to look out for the best interest of the child. If the implementation of digital text had not been such a strong culture on the Harper campus, then it would have been unlikely that Aubrey would have taken this task upon herself. Rather, Aubrey assimilated to this cultural aspect of the Harper campus, attended the training, and became a strong support of the campus' integration of digital text. Through this experience Aubrey was able to find a value in instructional strategies and support structures that she had not known previously. She now understood the purpose and value that digital text can provide for students.

In addition to the experience of finding value, Aubrey also redesigned her role at Harper campus based on the support needed for the students in inclusion classrooms and their accommodation of digital text. Aubrey was given additional planning periods so that she would have time to support the classrooms with digitally accessible text of class assignments, textbook, and tests. The campus expectation was for her to begin supporting the classrooms with digital text in the fall of 2012; however, she was not fully trained in the use of digital text until the winter of 2013. During the last four months of the school year, Aubrey learned the steps to convert Word® documents; locked PDF's, PowerPoint®, and scanned flyers to accessible digital text. It was this conversion process that gave Aubrey the most challenge. Aubrey had one extra

period on Friday to conduct the file conversions for the coming week, this proved to be problematic. Teachers were asked to send documents to her one to two weeks in advance so that she could prepare and pre teach the students. In reality, Aubrey was fortunate to have the document one day in advance. This resulted in Aubrey using her conference period Monday through Thursday to convert files and save them to the classroom folder on the campus *U* drive. Fridays now had become time for her to pull students for re-teaching and lesson completion. Another aspect that caused a barrier to converting files efficiently was the fact that the only software program the campus owned that would convert files was located in the assistant principal's office. This added another step in the process and often caused files to be delayed. When the assistant principal was out of the office, no one else was able to use the software. The system added additional barriers and forced Aubrey to look elsewhere for a solution. Aubrey's next choice was to look for online conversion websites. This option did not always help. Some programs were not very accurate in the conversion which would cause Aubrey to spend more time to edit the converted file. Other sites would only allow so many files to be converted before they started charging for the service. Aubrey had not budget for such costs and found she jumped from one free website to another. The process of converting files into accessible digital text was a service meant to break down barriers. The additional steps now required due to software restrictions had created a new barrier in the process of acquiring accessible materials for students. Thus the process that had been implemented to provide access for students had at times become an additional barrier to student access.

The experiences between Aubrey and the classroom teacher she supported were of great interest. As discussed in chapter four, the relationship between a special education teacher and the general education teacher was a tenuous point for Aubrey. She moved around most of the

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day from one room to another. On some days she would visit up to three classes in one class period. It is difficult to provide support or participate in planning when a teacher is expected to work with that many teachers in one day. Recall in chapter four, Aubrey found herself keeping her backpack on as she visited some classes, knowing she would not be long. Of all her classes it was the language arts classroom that Aubrey had spent the longest time in. It was in the language arts classroom that Aubrey had more influence and input into lesson implementation. Of special interest was her relationship with her co-teacher Sunshine.

Sunshine, a general education teacher, had experience working with co-teachers in the past. It was her previous experiences that influenced Sunshine's feelings about co-teachers. She hoped but did not require that her co-teacher agree with her teaching philosophy and believed that they could have a trusting relationship. Trust was a key requirement for Sunshine, and Aubrey met her expectations. Sunshine described her relationship with Aubrey as the Yin to her Yang. Through this analogy the picture of Aubrey and Sunshine working together as a team, with specific responsibilities separate from each other, yet joined for a common purpose. The interdependency each of them had for the other is what made their co-teaching partnership strong. Strong enough to overcome the personal struggles Sunshine experienced during the school year. It was through the support of Aubrey that Sunshine was able to make it through the year. Sunshine could trust Aubrey to continue on with the class just as she would have. Sunshine depended upon Aubrey for the implementation of digital text and the additional accommodation the students received. Sunshine depended upon Aubrey so much that she was not totally aware of the accommodations that Aubrey had been implementing but accepted that whatever Aubrey did was in the best interest of all the students, and not some or most of the students.

The experiences of Aubrey and Sunshine showed that the deep personal beliefs, attitudes, and values teachers have toward the experiences they encounter influence the integration of digital text and instructional supports. Aubrey's challenges with her schedule and converting of files was influenced by her value in assistive technology and the connection she made between the implementation of digital text and opportunities that could provide for her own son. Due to the deep emotional challenge Sunshine experienced without knowing new technologies in addition to other issues, in order for her to survive, she separated herself from the pedagogy and content that she would have normally included. Sunshine's challenges with students, technology, her personal life and ultimately herself influenced the decisions she made regarding her classroom and lesson development. In this study, the beliefs, attitudes and intentions teachers held toward the implementation of digital text and subsequent technologies influenced the learning opportunities of students with disabilities. In an effort to create systems that support the integration of digital text in the inclusive classroom, questions arose for future consideration.

Implications

The findings in this study refer to the role of the special education teacher and general education teacher as they develop lesson designs and implementation strategies for the inclusive classroom. The personal purpose and drive of the teachers in this study is to reach every child, no matter what disability they may have been labeled with. The implications of this study raises questions about the ways in which special education teachers be trained, and general education teacher trained to facilitate the collaboration between general education and special education teachers. Thus, these questions call for a conversation between relevant stakeholders, who are the special education teacher, general education teacher, campus and district administrators, and university and teacher education programs. While the special education teacher is seen as the

instructional expert for students with disabilities, they do not have the authority or input on the daily lesson or the implementation of that lesson. In order to influence the instruction of students with disabilities, general education teachers need to be trained in the strategies and principles of UDL. With a focus upon training the general education teacher a successful and sustainable implementation of digital text is possible.

Any implication associated with the training of teachers evokes the role of campus and district administrators in designing professional development programs both on campus and district wide. The content within these programs should reflect the support necessary for successful implementation of digital text grounded in appropriate pedagogies. In addition, the relationship between the general education teacher and special education teacher is critical to the successful implementation of technology, accommodations and specialized instructional plans. Therefore, this study raises the question about the role of the administrators in bringing together a collaborative relationship between general education and supporting teachers. In what ways do administrators support the development of a working collaborative relationship within the inclusive classroom and promote the implementation of technology based accommodations into the pedagogical foundation of lessons?

Additionally, university and teacher education programs are also a stakeholder in this effort and should examine the teacher education programs curricula in relation to technology integrations and the pedagogical foundations for instruction as well as dynamics of working with a collaborative teacher in inclusive settings. Traditionally, teacher education programs focused on the role of the teacher as the lone instructor in the class and ascribed the teacher the role of the general in the classroom. Collaborative teaching, whether it is in the form of co-teaching, in-class support, or consulting has implications for how decisions are made about designing and

delivering instruction. Most of these issues raise questions about the role of teacher education programs. In what ways do teacher education programs train pre-service teachers to collaborate with other teaching professionals in inclusive situations? In what ways are the principles of UDL and TPACK integrated in teacher preparation programs for both general education and special education majors? What might teacher education programs do to ensure better collaboration between teachers and pedagogy-based technology integration for accessible instruction?

Of final consideration are the implications for district level and administrative level of support for teachers in implementing digital text. In my interview with Lois, the special education chairperson for Harper, she mentioned that much of her responsibility at the beginning of the year was to ensure that all the computers on campus had the text-to-speech software installed. This was of particular interest to me as I was the district staff person who had previously put in the work order for the Harper campus to receive the software. What Lois had referred to was the fact that the computers on the Harper campus had been *re-imaged* over the summer and the text-to-speech software was not reinstalled on the new *image* (package of basic software). Reflecting on this issue, implications for the district's role in providing support structures could be raised. The district should examine the systems in place to support campuses that they are not causing interruptions of service and student access. It is necessary for all departments to communicate to ensure the proper installations and integration of digital text possibilities in the classroom. In Sunshine's experience, the timing of campus services appeared to put students' needs second in relation to the schedule of district facilities and staff. An evaluation of the ways in which campus support is timed such as painting of classrooms, introducing new technology, and providing training is necessary. If district staff does not

understand their role in the integration of digital text, and offer support to teachers, the consequence may be that the implementation of services may be impeded and eventually influencing students' learning in undesirable ways.

Future Direction for Research

Several considerations for future research are presented for the readers' consideration. This qualitative study was grounded in the substantive frameworks of TPACK and UDL. I presented a deep, rich understanding of Aubrey and Sunshine's experiences integrating digital text in the inclusive classroom. Thus I provide the following for future consideration of research.

First, a similar study where the participants are on separate campuses and not supported by a special education staff member is recommended. The results of this study would provide additional understand on how teachers experience the integration of digital text and accommodation for students with disabilities. What kind of support did the teachers find necessary for integration? What were the teachers' experiences in implementing digital text separated from special education support?

Second, another study similar to this study would be to research the experiences of using digital text in the inclusive classroom from the students' perspective. This would allow a deeper understanding of the implications of lesson design and the delivery of accommodations exploring issues of student engagement and motivation.

Third, a larger study on how the belief, attitudes and intention of teachers influence the integration of assistive technologies, UDL principles in the inclusive classroom is recommended. What are the participants' perceptions on the use of assistive technology in the inclusive

classroom? What are the experiences of teachers as they implement the UDL principles? In what ways to teachers beliefs and attitudes influence the implementation of assistive technology?

Lastly, a study on the use of the TPACK framework and survey with in-service teachers is recommended. This study would be beneficial in creating professional development for teachers that target specific needs of educators. It would provide the foundation for districts to develop technology integration training specific to the needs of content area teachers. Questions to explore could include: What are the unique contexts that influence TPACK confidence? In what ways does teachers reported TPACK confidence plays out in the classroom? How does a teacher's TPACK confidence change with the challenges of the daily work of the classroom? In what ways do campus TPACK profiles address the confidence in campus wide implementation of technology?

Additional topics for discussion include; what helpful strategies can be developed for the adoption of digital text and technologies on a campus wide basis; what aids and cautions can be offered in the implementation and application of TPACK knowledge in a collaborative method across content areas and in-class support teaching teams are recommended.

The discussion, connection to theoretical frameworks, literature, conclusion, implications, and future directions for research all point to the critical role teachers play when buried under a plethora of mandates and laws. Yet conscientious teachers work with deep commitment to reaching all students at any cost necessary instead of surrendering to the notion that reaching most students is good enough. Additionally, with a strong collaborative relationship between general education and special education teachers, teachers can find strength to offer sound instruction, maintain a balance in their TPACK components, and create opportunities for learning that reach a diverse group of students. Therefore, it becomes

necessary that these teachers are supported from a myriad of sources starting with effective

training at teacher education and educational leadership programs. Additionally campuses and

school districts should also identify ways in which they can support the teachers by keeping the

teachers' training needs in mind before implementing new technologies and policies. Teachers

who genuinely believe that no child should be left behind, regardless of their abilities, and work

with deep commitment, strong personal values to provide whatever accommodation needed for

learning to occur, should be celebrated, supported, and heard. This dissertation aimed to do just

that.

Summary

The focus of this study has been to provide a deep understanding of how two teachers

negotiated their experiences of integrating digital text in the inclusive classroom. In this chapter,

I have presented a brief summation of the study, the connections to frameworks, the

contributions to the literature, and conclusions of the study. I ended the chapter with a

discussion about the implications and possible future directions for research as a result of this

study. I encourage the reader to understand the experiences of the teachers in this study and

search for the ways in which they can support the teachers they work with in their attempts to

implement the accommodation of digital text in order to provide access to the general curriculum

for students with disabilities.

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Appendix A

Research Timeline

Time (in days, weeks, months)	Duration	Description of activity	Participant's role
This activity occurred throughout the study	• Varied	• Researcher's Reflexive Journal • Peer Debriefing	
Week 1	• 2 hours • 4 hours • 3 hour • 1 hour	• Meet with colleague for bracketing interview. • Transcribe interview • Contact Participants - Consent • Collect lesson plans and emails	• None • Respond to invitation • None
Week 2	• 1hour • 4 hours • 1 hour • 4 hours • 2 hours	• First formal interview with participant #1 • Transcribe interview • First formal interview with participant #2 • Transcribe interview • Meet with colleague for bracketing interview	• Respond to open-ended questions • None • Respond to open-ended questions • None
Week 3	• 1 hour • 2Hours • 4 hours • 2 hours • 2 hours • 1 hour • 3 hours • 4 hours	• Member check with participant #1 • Edit transcript • Do preliminary coding from interview #1 from participant #1 • Member check with participant #2 • Edit transcript • Meet with colleague for bracketing interview • Contact indirect participants • Do preliminary coding from interview #1 from participant #2	• Respond to open-ended questions • None • Respond to open-ended questions • Meet with researcher • None
Week 4	• 2 hours • 2 hours • 2 hours • 3 hours • 1 hour • 1 hour	• Observe participant #1 in classroom setting & take videos • Code data from video#1 and expand field notes from observation #1 • Interview indirect participants • Transcribe interviews • Meet with indirect Participants – Consent • Meet with indirect student participants	• None • None • Respond to open ended questions • None • Respond to invitation
Week 5,	• 1 hours • 8 hours • 1 hour • 2 hours • 1 hour • 1 hour • 2 hours • 6 hours • 1 hour	• Second formal interview with participant #1 • Transcribe interviews • Member check with participant #1 • Edit transcript • Second formal interview with participant #2 • Observe participant #2 in classroom setting & take videos • Code data from video#1 and expand field notes from observation #1 • Do preliminary coding for second interviews • Bracketing interview	• Respond to questions • None • Respond to transcript • None • Respond to open-ended questions • None • Respond to questions • Respond to transcript • None
Week 6,	• 6 hours • 1 hour	• Member check with participant #2 • Edit transcript	• None

		• Transcribe interviews and observations	• None
	• 2 hours	• Observe participant #1 in classroom setting & take videos	• None
		• Code data from video#2 and expand field notes from observation #2	
Week 7, Day 1	• 1 hour	• Third formal interview with participant #1	• Respond to open-ended questions
	• 3 hours	• Transcribe interview	• None
	• 1 hour	• Member check with participant #1	• Respond to transcript
	• 2 hours	• Edit transcript	• None
	• 1 hour	• Observe participant #2 in classroom setting & take videos	• None
	• 4 hours	• Do preliminary coding for third interview	• None
	• 2 hours	• Code data from video#2 and expand field notes from observation #	• None
Week 8,	• 1 hour	• Collection of participant's journals	• Return journal
	• 1 hour	• Bracketing interview	• None
	• 2 hours	• Third formal interview with participant #2	
	• 4 hours	• Transcribe interview	• Respond to open ended questions
	• 3 hour	• Coding of journal entries	
	• 3 hours	• Collect lesson plans and emails	• None
	• 4 hours	• Member check & edit transcript	• Respond to transcript
Week 9,	• 10 hours	• Continue to code transcripts from interviews, observations, archival data	• None
	•		
	• 6 hours	• Review transcripts/ interviews	
	• 3 hours	• Code/values coding	
Week 10,	• 3 hours	• Member checks with both participants	• Respond to researcher's analysis of data
	• 3 hours	• Transcribe interview	
		• Continue to code data	
Week 11	• 12 hours	• Create thematic maps	• None
	• 4 hours	• Determine Themes	
Week 12 and ongoing	• 20 hours	• Finalize write up of case studies	

Appendix B

Teacher (Direct Participant) Consent Form
Digital Text in the Inclusive Classroom: A Cross Case Comparison

I, _____, agree to participate in a case study as part of a doctoral
dissertation by Debra Stanley chaired by Dr. Kakali Bhattacharya (361-825-6017) from the Department of
Educational Leadership & Curriculum and Instruction at Texas A&M University, Corpus Christi titled *Digital
Text in the Inclusive Classroom: A Cross Case Comparison*. I understand that my participation is voluntary. I
can stop taking part without giving any reason, and without penalty. I can ask to have all of the information
about me returned to me, removed from the research records, or destroyed.
The reason for this study is designed so that the researcher can identify how two teachers who teach in
inclusive classrooms located in South Texas, describe their experiences about using digital text for students
with learning disabilities.

If I volunteer to take part in this study, I will be asked to do the following:
1. Attend three one-hour interviews with the researcher.
2. Clarify any follow-up questions the interviewer might have when interpreting my words.
3. Allow the interviewer to observe while videotaping my classroom instruction for three sessions one
   hour in length for each visit.
4. Keep personal journals of my experiences implementing electronic text in the inclusive classroom.
5. Complete a TPACK survey for the purpose of this study.
6. Share relevant documents with the interviewer such as lesson plans, electronic text instructional
   support systems, etc.
7. Check for accuracy in the researchers' transcripts and findings when depicting my information.

I understand that:
- The researcher will record classroom instruction, conversations and interviews that occur between the
  researcher and me.
- The data will be kept by the researcher and will be shared while maintaining confidentiality with Dr.
  Kakali Bhattacharya.
- The researcher will analyze the data and keep it for no longer than three years for educational and
  research purposes after the last date of data collection.
- There is no direct benefit for me participating in the project.
- No risk is expected but, if I experience some discomfort or stress during observations or
  conversations, then I can choose to discontinue my participation in the study without any penalty.
- No data will be published or presented without my explicit consent.

No identifiable information about me, or provided by me during the research, will be shared with others,
except if it is necessary to protect my welfare (for example, if I were injured and need physician care) or if
required by law. I will be assigned a pseudonym or I can choose one, which will be used in interview
transcript and all other data documents.
The researcher will answer any further questions about the research, now or during the course of the project.
I understand that I am agreeing by my signature on this form, to take part in this research project and
understand that I will receive a signed copy of this consent form for my records.

_____   _____
Researcher   Signature   Date

_____   _____ _____
Participant   Signature   Date

Appendix C

Parent Informed Consent Form

Digital Text in the Inclusive Classroom: A Cross Case Comparison

I, _____, give consent for my child to be videotaped as part of a doctoral dissertation by Debra Stanley chaired by Dr. Kakali Bhattacharya (361-825-6017) from the Department of Educational Administration & Research at Texas A&M University; Corpus Christi titled *Digital Text in the Inclusive Classroom: A Cross Case Comparison*. I understand that my child's participation is voluntary. He/ She can stop taking part without giving any reason, and without penalty. I can ask to have all information regarding my child removed from the research records, or destroyed.

The reason for this study is so that the researcher can gain some understanding of teacher's implementation of digital text in the classroom.

If I allow my child to take part in this study, I will be asked to do the following:

- Allow my son or daughter's presence in classes to be videotaped as part of observations of the classroom teacher during three sessions, one hour in length for each visit.
  I understand that:
- The researcher will videotape classroom instruction.
- The data will be kept by the researcher and will be shared while maintaining confidentiality with Dr. Kakali Bhattacharya.
- The researcher will analyze the data and keep it for no longer than three years for educational and research purposes after the last date of data collection.
- There is no direct benefit for my child participating in the project.
- Campus administrators and the classroom teacher will not be aware of which students have permission to be videotaped.
- No risk is expected but, if your child experiences some discomfort or stress during observations I can choose to discontinue my consent in the project without any penalty.

No information about my child will be shared with others, except if it is necessary to protect my welfare (for example, if my child were injured and need physician care) or if required by law. Your child will be assigned a pseudonym which will be used during observations and all other data documents.

The researcher will answer any further questions about the research, now or during the course of the project.

I understand that by my signature on this form, I agree for my son or daughter's presence in classes to be videotaped as part of observations of the classroom teacher and understand that I will receive a signed copy of this consent form for my records.

_____   _____

Parent   Signature   Date

_____   _____ _____

Researcher   Signature   Date

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Student Assent Form

Digital Text in the Inclusive Classroom: A Cross Case Comparison

Student name: _____

       Your parent (or guardian) has given consent for you to take part in a project about digital text in the classroom. You will not need to do anything other than participate in your class as you usually would. Your parent's decision for you to be videotaped will only be known by the researcher. Campus administrators and your classroom teacher will not be aware that you have agreed to take part or not take part in the project. Also, if you have any questions about what you will be doing, just ask me to explain. If you agree to be part of the videotaped observation, please sign your name on the line below. Remember, you can stop at any time and if you decide not to take part anymore, let me know. Your participation in these observations is appreciated. Your grades and/or classroom opportunities will not be affected by your decision.

      Signed: _____**Date:** _____

Appendix D

Teacher (Indirect Participant) Consent Form
Digital Text in the Inclusive Classroom: A Cross Case Comparison

I, _____, agree to participate in a case study as part of a doctoral dissertation by Debra Stanley chaired by Dr. Kakali Bhattacharya (361-825-6017) from the Department of Educational Leadership & Curriculum and Instruction at Texas A&M University, Corpus Christi titled *Digital Text in the Inclusive Classroom: A Cross Case Comparison*. I understand that my participation is voluntary. I can stop taking part without giving any reason, and without penalty. I can ask to have all of the information about me returned to me, removed from the research records, or destroyed.

The reason for this study is designed so that the researcher can identify how two teachers who teach in inclusive classrooms located in South Texas, describe their experiences about using digital text for students with learning disabilities.

If I volunteer to take part in this study, I will be asked to do the following:
8. Attend one, one-hour interviews with the researcher.
9. Clarify any follow-up questions the interviewer might have when interpreting my words.
10. Check for accuracy in the researchers' transcripts and findings when depicting my information.

I understand that:
- The researcher will record classroom instruction, conversations and interviews that occur between the researcher and me.
- The data will be kept by the researcher and will be shared while maintaining confidentiality with Dr. Kakali Bhattacharya.
- The researcher will analyze the data and keep it for no longer than three years for educational and research purposes after the last date of data collection.
- There is no direct benefit for me participating in the project.
- No risk is expected but, if I experience some discomfort or stress during observations or conversations, then I can choose to discontinue my participation in the study without any penalty.
- No data will be published or presented without my explicit consent.

No identifiable information about me, or provided by me during the research, will be shared with others, except if it is necessary to protect my welfare (for example, if I were injured and need physician care) or if required by law. I will be assigned a pseudonym or I can choose one, which will be used in interview transcript and all other data documents.

The researcher will answer any further questions about the research, now or during the course of the project. I understand that I am agreeing by my signature on this form, to take part in this research project and understand that I will receive a signed copy of this consent form for my records.

_____ _____

Researcher   Signature   Date

_____ _____ _____

Participant   Signature   Date

TEXAS A&M UNIVERSITY CORPUS CHRISTI

ERIN L. SHERMAN, MAcc, CRA, CIP, CPIA
Research Compliance
Officer Division of Research, Commercialization
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Human Subjects Protection Program	Institutional Review

Board

APPROVAL DATE: January 22, 2013

TO: Ms. Debra Stanley

CC: Dr. Kakali Bhattacharya

FROM: Office of Research
Compliance
Institutional Review
Board

SUBJECT: Initial Approval

Protocol Number: 110-12

Title: The Use of Digital Text in the Inclusive

Classroom Review Category: Full Board Review

Expiration Date: January 22, 2014

Approval determination was based on the following Code of Federal Regulations:

Criteria for Approval has been met (45 CFR 46.111) - The criteria for approval listed in 45 CFR 46.111 have been met (or if previously met, have not changed).

(a) In order to approve research covered by this policy the IRB shall determine that all of the following   requirements are satisfied:

   (1) Risks to subjects are minimized: (i) By using procedures which are consistent with sound research design and which do not unnecessarily expose subjects to risk, and (ii) whenever appropriate, by using procedures already being performed on the subjects for diagnostic or treatment purposes.

   (2) Risks to subjects are reasonable in relation to anticipated benefits, if any, to subjects, and the importance of the knowledge that may reasonably be expected to result. In evaluating risks and benefits, the IRB should consider only those risks and benefits that may result from the research (as   distinguished from risks and benefits of therapies subjects would receive even if not

participating in   the research). The IRB should not consider possible long-range effects of applying knowledge gained in   the research (for example, the possible effects of the research on public policy) as among those   research risks that fall within the purview of its responsibility.

(3) Selection of subjects is equitable. In making this assessment the IRB should take into account the   purposes of the research and the setting in which the research will be conducted and should be   particularly cognizant of the special problems of research involving vulnerable populations, such as   children, prisoners, pregnant women, mentally disabled persons, or economically or educationally   disadvantaged persons.

(4) Informed consent will be sought from each prospective subject or the subject's legally authorized   representative, in accordance with, and to the extent required by §46.116.

(5) Informed consent will be appropriately documented, in accordance with, and to the extent required by §46.117.

(6) When appropriate, the research plan makes adequate provision for monitoring the data collected to   ensure the safety of subjects.

(7) When appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the   confidentiality of data.

(b) When some or all of the subjects are likely to be vulnerable to coercion or undue influence, such as children,   prisoners, pregnant women, mentally disabled persons, or economically or educationally disadvantaged   persons, additional safeguards have been included in the study to protect the rights and welfare of these   subjects.

Provisions:
Comments:

This research project has been approved. As principal investigator, you assume the following responsibilities:

1. Informed Consent: Information must be presented to enable persons to voluntarily decide whether   or not to participate in the research project unless otherwise waived.
2. Amendments: Changes to the protocol must be requested by submitting an Amendment Application   to the Research Compliance Office for review. The Amendment must be approved by the IRB before   being implemented.
3. Continuing Review: The protocol must be renewed each year in order to continue with the research   project. A Continuing Review Application, along with required documents must be submitted 45 days   before the end of the approval period, to the Research Compliance Office. Failure to do so may result   in processing delays and/or non-renewal.
4. Completion Report: Upon completion of the research project (including data analysis and final   written papers), a Completion Report must be submitted to the Research Compliance Office.
5. Records Retention: Records must be retained for three years beyond the completion date of the   study.
6. Adverse Events: Adverse events must be reported to the Research Compliance Office immediately.

Appendix F

to udlcenter, Debra

To whom it may concern,

My name is Debra Stanley. I am a doctoral student at Texas A&M University-Corpus Christi. I am requesting permission to use the UDL Guidelines 2.0 graphic organizer image. My dissertation is a Dual Case Study of Digital Text in the Inclusive Classroom. I would like to include the image of the UDL guidelines 2.0 in my dissertation to support my substantive framework of UDL.

Rest assured that my intent for this information is strictly for my dissertation study, and not for profit. My dissertation Chair is Dr.Kakali Bhattacharya _____. The University mailing address is 6300 Ocean Drive, Corpus Christi, Texas 78412
I can be reached by phone at _____; by email at _____
mailing address _____

Your consideration to help me on this matter is greatly appreciated.

David Gordon <dgordon@cast.org>   Oct 3 (13
days ago)

to Susan, me

Dear Debra Stanley:

> Thank you for writing. CAST is pleased to grant permission to include the UDL Guidelines 2.0 graphic organizer in your dissertation. Please note the following conditions:
> ▪ You may use the image for informational and educational purposes only. However, you may not charge for such use.
> ▪ You must include the following copyright notice in any copy that you make: © CAST, 2013.
> ▪ You may not change the materials without further written permission from CAST.

Many thanks for getting in touch and good luck with your project.

Sincerely,

David Gordon

Director of Strategic Communications
CAST | http://www.cast.org
40 Harvard Mills Square, Suite 3
Wakefield, MA 01880

Enhanced TPACK model

2 messages

Matthew Marino <Matthew.Marino@ucf.edu>   Fri, Oct 4, 2013 at 11:23 AM
To: "mrstanley@clear.net" <mrstanley@clear.net>

> Hello Debra,
> This was forwarded to me. Please feel free to use the graphic. Best of luck with your dissertation!
> Matt
>
>
> To whom it may concern,
>
> My name is Debra Stanley. I am a doctoral student at Texas A&M University-Corpus Christi. I am
> requesting permission to use the Enhanced TPACK model with T expanded to include AT and IT
> graphic, Figure 2 from the article Enhancing TPACK with Assistive Technology: Promoting Inclusive
> Practices in Pre-service Teacher Education (2009).
>
> My dissertation is a qualitative research study titled: Like a Palm Tree in a Hurricane: A Dual Case
> Study of Digital Text in the Inclusive Classroom. I would like to include the image of the Enhanced
> TPACK model in my dissertation to support my substantive framework of TPACK.
>
> Rest assured that my intent for this information is strictly for my dissertation study, and not for profit.
> My dissertation Chair is Dr.Kakali Bhattacharya _____The University mailing address is
> 6300 Ocean Drive, Corpus Christi, Texas 78412
> I can be reached by phone at _____ by email at _____
> mailing address _____.
>
> Your consideration to help me on this matter is greatly appreciated.
>
>
> --
>
> Debra Stanley

Matthew T. Marino, Ph.D.
Associate Professor
University of Central Florida
College of Education & Human Performance
Department of Child, Family, and Community Sciences
PO Box 161250
Orlando, FL 32816-1250
Website

Appendix H

TPACK permission to use image

Using the image in your own works

Others are free to use the image in non-profit and for-profit works under the following conditions.

- The source of the image is attributed as http://tpack.org
- The author of the work does not make any claim to copyright over the image
- The publisher of the work does not make any claim to copyright over the image
- The image is captioned or credited as "Reproduced by permission of the publisher, © 2012 by tpack.org" (or something equivalent)

If those conditions are met, there is no need to contact tpack.org, Matthew Koehler, or Punya Mishra. We hereby grant permission to use the image under the above stipulations.

Appendix I

Survey of Teachers' Knowledge of Teaching and Technology

Digital Text in the Inclusive Classroom: A Cross Case Comparison

Thank you for taking time to complete this questionnaire. Please answer each question to the best of your knowledge. Your thoughtfulness and candid responses will be greatly appreciated. Your individual name or identification number will not at any time be associated with your responses. Your responses will be kept completely <u>confidential</u> and will not influence your course grade.

DEMOGRAPHIC INFORMATION

1. Your e-mail address

2. Gender

   __ Female   __ Male

3. Age range

   __ 18-22

   __ 23-26

   __ 27-32

   __ 32+

4. Area of Specialization (select all that apply)

   __ Early Childhood Education

   __ English and Language Arts

   __ Foreign Language

   __ Health

   __ History

   __ Mathematics

   __ Music

   __ Science-Basic

   __ Social Studies

   __ Speech/Theater

   __ Special Education

   __ Other

5. Year of experience in teaching
        __ 1-5
        __ 6-10
        __ 11-15
        __ 16-20
        __ 21+

6. Have you completed educational technology coursework?
        __ Yes

        __ No

6a. If so, please indicate types of coursework or training you have attended. Include hardware, software, theory, application strategies, etc.

7. Are you currently enrolled or plan to enroll for University classes in technology education or technology field? If you are currently enrolled in or have already taken one of these courses please list semester and year you completed the course.

Survey of Teachers' Knowledge of Teaching and Technology
Digital Text in the Inclusive Classroom: A Cross Case Comparison

Technology is a broad concept that can mean a lot of different things. For the purpose of this questionnaire, technology is referring to digital technology/technologies. That is, the digital tools we use such as computers, laptops, iPods, handhelds, interactive whiteboards, software programs, etc. Please answer all of the questions and if you are uncertain of or neutral about your response you may always select "Neither Agree or Disagree"

	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
I know how to solve my own technical problems.					
I can learn technology easily.					
I keep up with important new technologies.					
I frequently play around the technology.					
I know about a lot of different technologies.					
I have the technical skills I need to use technology.					
I have sufficient knowledge about mathematics.					
I can use a mathematical way of thinking.					
I have various ways and strategies of developing my understanding of mathematics.					
I have sufficient knowledge about social studies.					
I can use a historical way of thinking.					
I have various ways and strategies of developing my understanding of social studies.					
I have sufficient knowledge about science.					
I can use a scientific way of thinking.					
I have various ways and strategies of developing my understanding of science.					
I have sufficient knowledge about literacy.					
I can use a literary way of thinking.					
I have various ways and strategies of developing my understanding of literacy.					
I can select effective teaching approaches to guide student thinking and learning in mathematics.					
I can select effective teaching approaches to guide student thinking and learning in literacy.					
I can select effective teaching approaches to guide student thinking and learning in science.					
I can select effective teaching approaches to guide student thinking and learning in social studies.					
I know about technologies that I can use for understanding and doing mathematics.					
I know about technologies that I can use for understanding and doing literacy.					
I know about technologies that I can use for understanding and doing science.					
I know about technologies that I can use for understanding and doing social studies.					
I know how to assess student performance in a classroom.					
I can adapt my teaching based-upon what students currently understand or do not understand.					

	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
I can adapt my teaching style to different learners.					
I can assess student learning in multiple ways.					
I can use a wide range of teaching approaches in a classroom setting.					
I am familiar with common student understandings and misconceptions.					
I know how to organize and maintain classroom management.					
I can choose technologies that enhance the teaching approaches for a lesson.					
I can choose technologies that enhance students' learning for a lesson.					
My teacher education program has caused me to think more deeply about how technology could influence the teaching approaches I use in my classroom.					
I am thinking critically about how to use technology in my classroom.					
I can adapt the use of the technologies that I am learning about to different teaching activities.					
I can select technologies to use in my classroom that enhance what I teach, how I teach, and what students learn.					
I can use strategies that combine content, technologies and teaching approaches that I learned about in my coursework in my classroom.					
I can provide leadership in helping others to coordinate the use of content, technologies, and teaching approaches at my school and/or district.					
I can choose technologies that enhance the content for a lesson.					
I can teach lessons that appropriately combine mathematics, technologies, and teaching approaches.					
I can teach lessons that appropriately combine literacy, technologies, and teaching approaches.					
I can teach lessons that appropriately combine science, technologies, and teaching approaches.					
I can teach lessons that appropriately combine social studies, technologies, and teaching approaches.					
My mathematics education co-workers appropriately model combining content, technologies and teaching approaches in their teaching.					
My literacy education co-workers appropriately model combining content, technologies and teaching approaches in their teaching.					
My science education co-workers appropriately model combining content, technologies and teaching approaches in their teaching.					
My social studies education co-workers appropriately model combining content, technologies and teaching approaches in their teaching.					
My district support staff (Specialist/Consultants) appropriately models combining content, technologies and teaching approaches in their teaching.					

52. Describe a specific episode where district support staff, professor or instructor effectively demonstrated or modeled combining content, technologies and teaching approaches in a classroom lesson. Please include in your description what content was being taught, what technology was used, and what teaching approaches were implemented.

53. Describe a specific episode where you observed another teacher effectively demonstrated or modeled combining content, technologies and teaching approaches in a classroom lesson. Please include in your description what content was being taught, what technology was used, and what teaching approaches were implemented. If you have not observed a teacher modeling this, please indicate that you have not.

54. Describe a specific episode where you effectively demonstrated or modeled combining content, technologies and teaching approaches in a classroom lesson. Please include in your description what content you taught, what technology you used, and what teaching approaches you implemented.