# THE IMPACT OF PROFESSIONAL DEVELOPMENT THROUGH A GRADUATE COURSE ON MULTIMEDIA TECHNOLOGY ON TEACHERS' BELIEFS ABOUT MULTIMEDIA AND THEIR IMPLEMENTATION OF MULTIMEDIA INTO THEIR TEACHING PRACTICE, INCLUDING TO MEET THE COMMON CORE STATE STANDARDS

by

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A dissertation submitted to the

Graduate School of Education

Rutgers, The State University of New Jersey

In partial fulfillment of the requirements

For the degree of

Doctor of Education

Graduate Program in Literacy Education

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MAY, 2019

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## ABSTRACT

The purpose of this study was to help determine teachers' beliefs about multimedia and its relationship to literacy and the literacy standards of the Common Core State Standards (CCSS). It looks at how four teachers' professional development experiences through an online graduate course at Rutgers University called "Web-Based Multimedia Design for Educators" influenced their beliefs about multimedia and their own efficacy to infuse multimedia into their lessons to meet state and local standards. The questions which guided this study were:

1) What beliefs do teachers have regarding multimedia and literacy?

2) How does teacher professional development in a graduate course on web-based multimedia instruction impact the way they think about multimedia and its purpose in classroom instruction?

a. How does what the teachers learn about multimedia influence their efficacy to infuse multimedia into their lessons?

b. How does what they learn influence their view of how multimedia can be interpreted and articulated to meet the Common Core State Standards?

This study was informed by the research related to multimedia, literacy, teacher beliefs, and teacher professional development. The Technology Acceptance Model (Davis, 1989; 1993) was also utilized to inform the analysis of data and to determine the multiple factors that could potentially impact the teachers' acceptance or rejection of multimedia technology into their instruction. The findings of this research study demonstrated that studying teachers' beliefs can provide insight into teachers' rationale for utilizing or rejecting the use of multimedia technology.

The Technology Acceptance Model provided a useful analytic lens through which to identify intrinsic factors that affected teachers' use of multimedia technology, such as their beliefs about multimedia technology and their feelings of self-efficacy to use multimedia in their instruction. It also helped to identify external factors that impacted their beliefs and usage of multimedia technology, such as the state mandated Common Core State Standards; their professional development; their access to resources; and pressures from schools leaders and curriculum requirements. Though the teachers did not define or utilize multimedia technology in the same way, they did feel it benefited students' learning and engagement and their ability to enhance students' literacy skills.

# DEDICATION

For Bob, Brian, and Matthew and for all of the support received from family and friends. A special shout out to Erica Holan Lucci who made my time at Rutgers both educational and fun. I could not have accomplished this without all of you.

And in memory of my sister Maureen and my parents Marion and Peter Kiernan, who always emphasized the importance of a good education and servicing the community.

ACKNOWLEDGEMENTS

I would like to thank my Chair, Dr. Erica Boling for her constant support and guidance throughout my education at Rutgers and for mentoring me throughout many projects and teaching experiences over the years. I would also like to thank Dr. Cheryl McLean and Dr. Ross Todd for their insightful feedback and support

throughout this process. I would also like to thank all of my professors at Rutgers for providing me with an excellent education. A special thanks to the people who reminded me that sometimes persistence is more important than perfection.

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# CHAPTER I

# INTRODUCTION

As a former English teacher and school administrator, I have always been interested in my students' communication practices and trying to figure out what they needed to learn in order to be prepared in their future lives. Throughout my career, I have also seen state tests and federal mandates come and go, along with government administration and changes in educational trends. I have personally felt the pressures of teaching in a tested area and have had to react to each change along with my colleagues on the school level to make sure we were addressing what was necessary in the classroom to ensure that students were properly prepared. But even in those moments, I felt like the mandates were not able to keep up with all of the changes in the ways that students were communicating, or with the technology that seemed to be exponentially evolving. I have witnessed the tides of constant technological change having a broad impact on my students' literacy practices and how they were interacting and communicating, and I became particularly interested in the evolution of their increased accessibility to interactive multimedia tools. However, I felt like I was just an observer trying to navigate what to do with my anecdotal observances, realizing I could only truly affect my own students based on my own beliefs about what was best for them.

Ultimately, I felt that I needed to do more to keep up with my own professional development and decided to go back to graduate school and to educate myself on the theories related to this ever-changing landscape that I was witnessing on a daily basis in my own classroom. I have always believed that behind every educational theory or state or federal mandate that needed to be implemented in schools, are the teachers who are charged to ake them come to life in the classroom, as well as the professional development coordinators

who have to design and carry out a professional development plans to show them how to do it. Mandates and ideas can have great power, but ultimately it is the teachers who have to learn how to embrace the changes to make it happen. At times, this can feel daunting—it always was for me. We have seen from the research that mandates can come and go, and some come and go faster than others; but the constraints of time and money do not always seem as important as the understanding that is needed for these ideas to really come to fruition. The research shows that professional development is an important factor for helping teachers to meet the challenges that come with expectations for changes in their teacher practice as a result of new initiatives (Borko, 2004; Darling-Hammond, Chung Wei, Andree, & Richardson, 2009; DeMonte, 2013). One form of professional development is through university courses (Avalos, 2011; Borko, 2004; Gibson & Skaalid, 2004).

During the course of this study, the Common Core State Standards initiative that was originally adopted by the State of New Jersey in 2010, experienced some changes. The standards have since been re-named as the New Jersey Student Learning Standards (NJSLS). In addition the PARCC test that was associated with the standards has also since been renamed as the New Jersey Student Learning Assessments (NJSLA). These name changes were largely the result of the controversy surrounding the Common Core State Standard initiative, which I will outline in more detail in the background discussion of this paper. The name change in New Jersey was largely designed to help change the "perception" of the testing and to distance the new testing and standards away from the "many negative connotations tied to PARCC" and the Common Core State Standards (Lowe, 2018) which led to many parents opting students out of taking the assessment altogether. This subsequent change is one of many that I have seen in my career. However, it should be noted that the changes to the standards and the testing were largely

superficial, and the content of the standards and the testing were generally unchanged (Lowe, 2018). For the purpose of this paper, I will continue to refer to the Common Core State Standards (CCSS) Initiative since that is what the initiative was called when the study began.

As an educator, I have always felt that it is a challenge to navigate theory and practice, as well as state and federal mandates. When you are not the designer of any proposed or required changes, it can be difficult to purely see and understand the intended vision that needs to be implemented in a real, practical, and tangible way--one that will hopefully have a positive impact student learning. Prior to this study, I had the opportunity to work with other educators at Rutgers University to design a series of three graduate level courses in educational technology that would provide professional development for teachers.

The course I was most interested in studying was the "Web-Based Multimedia Design for Educators" course because it was designed to be a practical course that would lead teachers to understand the theory around multimedia technology, while also learning practical classroom applications. The course had already been designed and implemented before the Common Core State Standards (CCSS) were adopted in New Jersey in 2010. However, I was intrigued when I saw that the literacy standards of the Common Core State Standards included multimedia, and I was curious how the new standards and mandates would be met by teachers and schools. It was not the first time that I had seen new standards in New Jersey, but it was the first time that I had seen multimedia technology integrated into literacy standards, as opposed to being listed as stand-alone technology standards. I wondered immediately if this represented a change in how multimedia literacy could be approached and understood in the classroom, and if this would impact how teachers perceived multimedia literacy and/or if it would impact their practice. For the purpose of this study, teacher beliefs refer to "a particularly provocative form of personal

knowledge that is generally defined as pre or in-service teachers' implicit assumptions about students, learning, classrooms, and the subject matter to be taught" (Kagan, 1992, p. 65-66). I will discuss this further in the literature review in Chapter 2.

I was interested in this study on many levels. I have always been very interested in multimedia literacy and in the changing communication practices of students. I am also interested in teacher professional development and how teachers prepare themselves and their lessons for their classroom teaching. My own beliefs about teacher professional development align with Beatrice Avolos' (2011) description that "professional development is about teachers learning, learning how to learn, and transforming their knowledge into practice for the benefit of their students' growth" (p. 10). To me this describes the professional development experiences that can be accomplished through university-based education courses for teachers, such as the "Web-Based Multimedia Design for Educators" course.

Though it was not the purpose of the "Web-Based Multimedia Design for Educators" course to address the Common Core State Standards or the state or federal mandates that included multimedia, I was interested to see if the teachers enrolled in the course were aware of these changes and if it was going to have an impact on their beliefs about multimedia or on how they approached teaching with multimedia. Since this was a course the teachers elected to take, I wanted to what impact, if any, the course as a form of professional development had on them. I felt it was important to study what teachers were thinking about multimedia and the changing literacy practices of their students, which were the result of changing technological landscapes in our society.

To begin, I would like to provide some context for the organization of this chapter. I realized while conducting this study that there were many research components and factors that

intersected in this study. In this first chapter, I have provided some background information on some of the research that is relevant to this study; though I will expand on this research more in the Literature Review in Chapter 2, I felt that it was important to provide some context here. I have included the background of the development and adoption of the Common Core State Standards as a state and federal initiative, as well as on some of the general research on the impact of technology on the literacy practices of students. In many ways, the incorporation of multimedia into the literacy standards of the Common Core State Standards reflected an acknowledgement of the changing literacy practices of students as a result of technology. One of the goals of the language arts standards of the Common Core State Standards was to state the skills needed to be college and career ready and to acquire the skills needed to be literacy in the 21st Century. Because teacher beliefs about the multimedia and the Common Core State Standards are part of this research study, I have included some of the research background here to provide context for the study.

**Background for the Study**

Technology has impacted the way that people communicate, and this is also reflected in the literacy practices of students (Alison & Goldston, 2018; Walsh, 2017 Coiro, Knobel, Lankshear & Leu, 2008). Pew Research Center data (2018) suggests that roughly 9 in 10 adolescents go online daily multiple times a day, and 95% of teens have access to a smartphone (Anderson & Jiang, 2018). Research reflects that technology has an impact on students' literacy practices and communication; for example, much has been written about how technological changes have impacted students' reading and writing practices and habits (Coiro & Dobler, 2007; Levy, 2009; Walsh, 2017). In today's digital society, "text" does not just include the printed word, but can also refer to different forms of media from different types of digital online

sources, including social media (Considine, Horton, & Moorman, 2009; Walsh, 2017). As a result, the notion of literacy has evolved along with the technological advances, and "students right now require a repertoire of both print and digital literacy practices for their future workplace and life" (Walsh, 2017, p. 5). This impacts classroom teaching because the notions of traditional reading and writing literacy have evolved to also include multimedia texts. Today, "reading and writing with screen-based, digital texts entails the reading and writing of text with images, graphics, icons and hyperlinks that are usually not presented in a left-to-right, linear format" (Walsh, 2017).

Researchers have acknowledged that communication forms today increasingly incorporate mediums such as image, video and sound; and these visual, auditory and written modalities now frequently intersect, forming a dynamic, multifaceted message where meaning can be derived from how these different modes are combined and arranged (Walsh, 2017; Sheridan & Rowsell, 2010; Kress, 2009; Kress 2003; Unsworth 2008; Van Leeuwen 2008). Some schools have been slow to reflect these changes in their instruction, however, and have relied more on teaching traditional print-based literacies, rather than addressing how diverse media and text can be understood in context with each other (Cope & Kalantzis, 2000; Luke, 2003; Selfe, 2004; Sturken & Cartwritght).

Recognizing that schools needed to change their educational focus to better prepare students for life and work in the 21st Century, the Common Core State Standards (CCSS) initiative was started in 2008 by the National Governor's Association (NGA) (Xu & Cepa, 2018). They believed that creating common, internationally benchmarked literacy and math standards was necessary in order to ensure that American students were more prepared to be competitive in the increasingly more globalized society of the 21st Century (Bidwell, 2014). In

their 2008 report, "Benchmarking for Success: Ensuring U.S. Students Receive a World Class Education" (2008), the National Governor's Association (NGA) stated:

> If states in other countries can shape the response to the global education imperative, states in America must do so as well. And state leaders have both the authority and an obligation to ensure that students attend globally competitive schools and school districts. America cannot maintain its place in the world—economically, socially, or culturally—unless all of its students gain the skills that allow them to compete on a global scale. The United States will only achieve true international competitiveness when state education policies and institutions are restructured to meet 21st century realities (39).

The National Governor's Association along with the Council of Chief State School Officers; the independent educational reform group, Achieve (2016); and a committee of various leaders in education, higher education, and business then came together to write the standards. Along the way, the standards were open to the public for review and comments and were then rewritten based on feedback (Bidwell, 2014). The standards were released in 2010, and were initially adopted by 42 states. The adoption of the "common" standards by the majority of states was significant since prior to the adoption of the CCSS, each state had its own literacy standards, and there was no real consensus across states about what literacy skills should be taught, or how the skills would be tested (Bidwell, 2014). It was believed that having "common" standards would also allow for the potential of collaboration and a sharing of resources between states (Burns, 2012; Xu & Cepa, 2018).

One of the specific 21st Century literacy skills which is reflected and integrated throughout the Common Core literacy standards from grades 3-12 is the expectation that students will be able to read, write, and speak utilizing "multimedia" texts (Royer & Richards, 2013). In

the "Key Points in English Language Arts" (2010) it is asserted that "just as media and technology are integrated in school and life in the twenty-first century, skills related to media use (both critical analysis and production of media) are integrated throughout the standards" (para.12). Overall in the K-12 standards, the terms "multimedia;" "diverse media;" or "interactive elements on Web pages" are mentioned throughout the literacy standards, beginning in 3rd grade, and they are included in literacy standards for English and Language Arts Reading Literature (RL); English Language Arts Reading Information (RI); Reading in Science and Technology (RST); Reading in History and Social Studies (RH); ELA-Literacy Writing (W); Writing in History, Science and the Technical Areas (WHST); and ELA- Speaking and Listening (SL). (See Appendix B for a chart reflecting the CCSS multimedia standards).

It should be noted, however, that standards, like curriculum, have the potential to be interpreted by teachers in different ways based on their own beliefs and understandings. Thorton (1991) has argued that what teachers believe about learning, curriculum, and instruction influences their teaching decisions, and that any "official" curriculum will be open to different interpretations and uses by teachers based on "his or her frame of reference" (p. 2). Therefore, I felt it was important to provide some context surrounding the development and adoption of the Common Core State Standards as well as for the literacy standards which include multimedia.

**Problem Statement**

While the Common Core State Standards acknowledge the changed literacy practices of students, the standards are not specific about how instruction should be implemented, or which theoretical perspective or definition of multimedia literacy teachers and schools should utilize in order to achieve the standards. Though there are some instructional models and examples given, the standards were designed to be open to the interpretation of the educators at the local level

(CCSS Initiative, 2010; Eilers & D'Amico, 2012; Rothman, 2011). However, there are many varying definitions, approaches, and schools of thought that can be related to developing an understanding of multimedia texts and literacy (Coiro, Knobel, Lankshear & Leu, 2008; Considine, Horton, & Moorman, 2009).

Multimedia is generally understood in education as a digital technology which integrates different media such as text, graphics, sound, video and animations (Neo, Tse Kian & Eshaq, 2007). However, the study of multimedia can also be related to other literacy terms and research. Though this is not an exhaustive list, some related terms and research lenses include the study of multiliteracies (Cope & Kalantzis, 2000; New London Group, 1996); multimodal literacies (Kress & Van Leeuwen, 2001; Kress, 2003; Kress, 2004; Unsworth 2008; Van Leeuwen 2008); new literacies (Coiro, Knobel, Lankshear & Leu, 2008; Lankshear & Knobel, 2003); and transliteracy (Ipri, 2010; Sukovic, 2013; Jaeger, 2011; Thomas, S., Joseph, C., Laccetti, J., Mason, B., Mills, S. & Perril, S., 2007). Given the various possible perspectives teachers could have about multimedia, it is important to research teachers' beliefs about the CCSS as well as their beliefs about their ability to articulate the standards. For the purpose of this study, "teacher beliefs" are defined as "a particularly provocative form of personal knowledge that is generally defined as pre or in-service teachers' implicit assumptions about students, learning, classrooms, and the subject matter to be taught" (Kagan, 1992, p. 65-66).

While it was not the purpose of this study to define, interpret, analyze, or validate any or all of the different approaches and definitions of multimedia or its related terms, it is important to acknowledge that the term "multimedia" can be interpreted in different ways by different educators. Given the myriad of ways in which the term multimedia can be interpreted and approached, it is important to first try and understand how teachers may be interpreting the term

"multimedia." Teachers' beliefs are important because they impact their perceptions and decision making with regard to their instructional practices (Pajares, 1992). Teachers' beliefs also have an impact on the way they use, understand, and approach technology in the classroom (Angers & Machtmes, 2005; Antonietti & Giorgetti, 2006; Brinkerhoff, 2006; Chen, Looi & Chen, 2009; Ertmer, 2005; Ertmer, P. A., Ottenbreit-Leftwich, A. T., Sadik, O., Sendurur, E., & Sendurur, P., 2012); this is important given the intrinsic relationship between multimedia and technology.

Understanding teachers' beliefs is also an important factor when considering teacher practice and teacher training/professional development. The purpose of professional development for teachers is to facilitate "change in the classroom practices of teachers, change in their beliefs and attitudes, and change in the learning outcomes of students" (Guskey, 1986, p. 383). In order to make any change in teacher practice, it is important to know what teachers' beliefs are because it is at the teacher level where any change or reform movement will succeed or fail (Porter, Fusarelli & Fusarelli, 2015). Research shows that if teachers' beliefs are not aligned with the policies of the reforms they must adopt, that they will abandon the reform and revert to familiar practices (Guskey, 2002).

Teachers are less likely to implement change that is confusing, hugely different from their current practices, or which they feel will not lead to any positive impact (Avalos, 2011; Guskey, 1986). A teacher's ability to adapt to change is dependent on his or her ability to articulate the new vision, and professional development can be an important factor to help facilitate this transition (Borko, 2004; Darling-Hammond, Chung Wei, Andree, & Richardson, 2009; DeMonte, 2013). The constant change and controversy surrounding the Common Core State Standards has made adapting to this change more challenging for educators (DeNisco, 2017), and the research into teachers' beliefs about the CCSS demonstrates that they did not feel

fully prepared to implement the standards (Gewertz, 2014; Hirsch, Lappan, & Reys, 2012; Troia & Graham, 2016).

In addition, teacher preparation programs in literacy, which are an important form of teacher professional development, still focus more on print-based literacies rather than the literacies related to the "kinds of meaning-making that students do which include more of a focus on multiple modes such as sound, animation, visuals, moving images, and spatial dimensions" (McLean & Rowsell, 2013, p.1). In their study "Teacher education: a call for change," McLean and Rowsell (2013) argue that in order for teachers to better prepare students for the literacy skills needed in 21st Century society, teacher preparation programs need to change as well in order to prepare educators to teach these more contemporary technological literacies. This new type of teacher training in literacy would not only inform teachers about the linguistic theory of traditional print-based literacies, but also how to develop an understanding of the "design principles," that inform other modes of literacy, such as multimedia (McLean & Rowsell, 2013, p. 1). More research needs to be done, however, on the impact that professional development can have on how teachers understand multimedia as a literacy. Helen Timperley in her publication "Teacher professional learning and development" (2008) points out that

> professional learning is strongly shaped by the context in which the teacher practices. This is usually the classroom, which, in turn, is strongly influenced by the wider school culture and the community and society in which the school is situated. Teachers' daily experiences in their practice context shape their understandings, and their understandings shape their experiences (6). Because teachers bring their own understanding of teaching, of pedagogy and their own experiences to any professional development experience

(Timperley, 2008), it is also important to study and contextualize the circumstances that may impact teachers' instruction on an everyday basis. This is especially important when looking at the professional development of teachers with regard to a technology such as multimedia. This study focused on the professional development teachers received through a graduate online course for teachers called "Web-Based Multimedia Design for Educators," and the impact the course had on their beliefs about multimedia.

**Statement of Purpose**

Therefore, the purpose of this study was to look at the beliefs teachers have about multimedia and its relationship to literacy. It looks at how teachers' professional development experiences through a university based online graduate course called "Web-Based Multimedia Design for Educators" within a teacher preparation program in New Jersey influenced their beliefs about multimedia and their own efficacy to infuse multimedia into their lessons to meet state and local standards. This study was guided by the following research questions:

1) What beliefs do teachers have regarding multimedia and literacy?

2) How does teacher professional development in a graduate course on web-based multimedia instruction impact the way they think about multimedia and its purpose in classroom instruction?

   a. How does what the teachers learn about multimedia influence their efficacy to infuse multimedia into their lessons?

   b. How does what they learn influence their view of how multimedia can be interpreted and articulated to meet the Common Core State Standards.

**Significance of Study**

Research shows that there is a connection between what teachers believe about teaching and how students learn, and what they actually carry out in the classroom, including in terms of technology integration (Cuban, 2001; Lim & Chan, 2007; Zhao, Pugh, Sheldon & Byers, 2002). In their study "Teachers' beliefs about learning from multimedia," Antonietti and Giorgetti (2004) also argue that because multimedia integration by teachers is influenced by their beliefs about its impact on learning, "it is extremely important to consider what teachers think about multimedia technological practices" (p. 280). There is little research specifically about teacher beliefs and training on multimedia or on how teachers interpret the term "multimedia" in the Common Core State Standards, given its many connotations and associations.

The purpose of the study was to also provide insight into teachers' beliefs about the term "multimedia," and how they incorporate multimedia into their instruction. This study was also designed to provide insights into teachers' beliefs about how multimedia can be interpreted within the CCSS literacy standards. Because the standards don't specifically dictate how teachers should meet them, this study may provide insight into how teachers define what multimedia is and how they may visualize its implementation in the classroom. In addition, this study may provide insight into how professional development in a university-based online course impacts teachers' beliefs about multimedia and literacy. This may prove useful to the larger educational community as educators in New Jersey and across the country have continued their implementation of the Common Core State Standards and their understanding of technology implementation in the classroom.

My next chapter will include the literature related to this study, which provides background and context for the study. This includes additional research on teacher beliefs and their significance to teachers' technology integration; the literature related to multimedia and to

literacy; the literature related to teacher professional development, including online university courses; the literature related to general technology integration; the literature related to the Technology Acceptance Model; and the background of the Common Core State Standards initiative.

# CHAPTER 2

# LITERATURE REVIEW

The first research question informing this study is "What beliefs do teachers have regarding multimedia and literacy?" Teacher beliefs are an important factor when considering education and the impact that teachers have in the classroom. Pajares (1992) argues that teacher beliefs are an important consideration in educational research because "the beliefs teachers hold influence their perceptions and judgments, which in turn affect their behaviors in the classroom" (p. 307). As stated in my previous chapter, for the purpose of this study, "teacher beliefs" are defined as "a particularly provocative form of personal knowledge that is generally defined as pre or in-service teachers' implicit assumptions about students, learning, classrooms, and the subject matter to be taught" (Kagan, 1992, p. 65-66).

With the adoption of the CCSS, teachers have been faced with making an adjustment to new curriculum requirements, and what their beliefs are about how multimedia and literacy are linked in the CCSS are worthy of consideration. Many researchers have noted that teachers often rely on their "beliefs" about teaching and learning when making instructional decisions (Daly, Moolenaar & Liou, 2015; Ertmer, Ottenbreit-Leftwich, et. al, 2012; Kagan, 1992; Antonietti & Giorgetti, 2004; Ertmer, 2005; Hermans, Van Braak & Valcke, 2008). Because teachers' beliefs can impact their delivery of curriculum, it is possible that their beliefs will impact their understanding of and implementation of the CCSS (Liou, Moolenaar & Daly, 2015). Defining exactly what their beliefs are is a difficult undertaking, but it is important to research given the impact that teachers' beliefs can have on how a curriculum is articulated.

Many of the Language Arts Standards include the usage of digital technology, including multimedia. There has been much written about the connections between general teacher beliefs

and curriculum as well as teacher beliefs as they relate to the adoption of technology in their classroom instruction. The literature from both of these areas may provide insight into how teachers may react to and adapt to the new Common Core Language Arts Standards which include multimedia and technology integration.

Kagan (1992) points out that a discussion of "teachers' beliefs" can often encompass similar and related terms, such as teachers' "principles," "personal epistemologies," "perspectives," "practical knowledge," and "orientations" (p.66). There have also been connections made between teacher beliefs and self-efficacy (Wang, Ertmer & Newby, 2004; Brinkerhoff, 2006) and teacher beliefs and knowledge (Chen, Looi & Chen, 2009; Ertmer & Ottenbreit-Leftwich, 2010; Hallett, 2010). Though it is acknowledged that it is difficult to *exactly* categorize what individual teacher beliefs are comprised of and how they are formed, it is generally accepted that it is very difficult to get teachers to change the beliefs they have, particularly when asking them to incorporate something new, such as a technological innovation or a change in curriculum (Ertmer, 2005).

**Teacher Beliefs and Technology**

Research shows that there is a connection between what teachers believe about teaching and how students learn, and what they actually carry out in the classroom, including in terms of technology integration (Ertmer, et al., 2012; Lim & Chan, 2007; Ertmer, 2005; Cuban, 2001; Zhao, et al., 2002; Lim & Chai, 2008; Angers & Machtmes, 2005). There are many factors which can affect teacher beliefs about how technology can and should be used instructionally. Ertmer, et al. (2012) stressed there is a "critical relationship" (p. 423) that can exist between teachers' beliefs and their use of instructional technology. They argue the beliefs that teachers

have may provide insight into this, since it may be their beliefs about technology integration that impacts their usage of technology, as opposed to a lack of access or training.

In addition, if it becomes evident what the teachers' beliefs are, it may be possible to facilitate their acquisition of new knowledge and skills as well as to impact their beliefs (Ertmer, et al., 2012). This is true of teachers' beliefs about multimedia as well. In their study "Teachers' beliefs about learning from multimedia," Antonietti and Giorgetti (2006) argue that because multimedia integration by teachers is influenced by their beliefs about its impact on learning "it is extremely important to consider what teachers think about multimedia technological practices" (p. 280). They point out that knowing what teachers believe about multimedia can be helpful for determining what can be carried out in professional development programs

> since nowadays almost all teachers are exposed to multimedia instructional instruments…[and] we can assume that whether they make use or not of multimedia tools in school activities, teachers have construed in their mind, explicitly or implicitly, some ideas about the potentialities and the dangers of these tools in learning (p. 268).

Cuban (2001) argues that there are many factors that lead to teachers' acceptance and/or rejection of technology integration, such as ease of use, how it impacts student motivation, its compatibility with the curriculum, and its impact on student learning. Similarly, Zhao and colleagues (2002) point out that there are "three conditions that must be met" (p. 502) before teachers will consider adopting technology: 1) teachers must believe that technology usage can improve their pedagogical goals; 2) teachers must believe that using technology will not detract from teaching necessary content and skills; and 3) teachers must believe that they have the knowledge and skills necessary to incorporate technology. However, what is needed is a model

to help tease out and further understand what their beliefs are and what their subsequent behaviors may be as a result of those beliefs.

There are several models related to educational technology as a general construct. In her book *Learning First, Technology Second*, Liz Kolb (2017) summarizes and describes many of the theoretical frameworks for educational technology integration, and she argues that "educational technology has struggled to develop a solid theoretical and practical framework for technology integration" and that "researchers continue to lament that studies examining preservice teachers' development of technology skills lack a clearly articulated theoretical framework" (p. 20).

In her summary of current technology frameworks Kolb (2017) acknowledges Mishra and Koehler's (2005) TPCK framework which "focuses on the integration of technological, pedagogical, and content knowledge" of teachers (p. 21). She also describes the Technology Integration Matrix (TIM), which considers "five levels of technology integration: entry, adoption, adaptation, infusion, and transformation" (p. 23); and the SAMR model which was developed by Dr. Ruben Puentedura in 2012 and which "considers how the technology tool is being used in the classroom setting and is based on four types of technology use: substitution, augmentation, modification, and redefinition" (p. 24). She then introduces her own framework the Triple E Framework, which is designed to "look beyond artificial engagement or substitution of traditional tools and consider how technology could push students into a direction that extends the content-specific learning goals" (p. 30); her framework is based on three components: "Engagement in learning goals; Enhancement of learning goals; and Extension of learning goals" (p. 30). While all of these models arguably provide important insights into the impact and effectiveness of teachers' use of technology in the classroom, none of them take into

consideration the integration of other multiple factors that impact teachers' ability to integrate technology, such as their personal beliefs, or the external factors, both real and perceived, that they experience which impact their ability or choice to integrate or reject a particular technology.

This study demonstrated that the Technology Acceptance Model (Davis 1989; 1993) can also be a useful tool for examining the many intersecting factors that may lead to teachers' acceptance or rejection of multimedia technology. The two main components of the Technology Acceptance Model, "Perceived Usefulness," which is based on the Theory of Reasoned Action (Ajzen & Fishbein, 1980); and "Perceived Ease of Use," which is based on the Theory of Planned Behavior (Ajzen, 1991; ) provide valuable insight into the factors that may lead teachers to ultimately accept or reject the use of multimedia technology.

## The Technology Acceptance Model (TAM)

As discussed above, teachers' beliefs are important and impact their instructional behaviors, including their adoption of technology. The Technology Acceptance Model (TAM) is a widely used framework developed by Davis (1989; 1993) in order to study how technology is used and ultimately accepted or adopted into common practice (Teo, 2012). Though this framework has been mainly utilized in business areas to research the implementation of information systems, this model can also be applied to education research with regard to teachers' adoption of technology (Teo, 2010; Holden & Rada, 2011; Gu, Zhu & Guo, 2012). The model, as seen in the figure and terms chart below, shows that for individuals to adopt a particular technology, they will consider the "perceived usefulness" and the "perceived ease of use" of the technology. These two factors will determine their "attitude" toward the technology and subsequently whether or not it should be adopted and utilized:

**Figure 1**

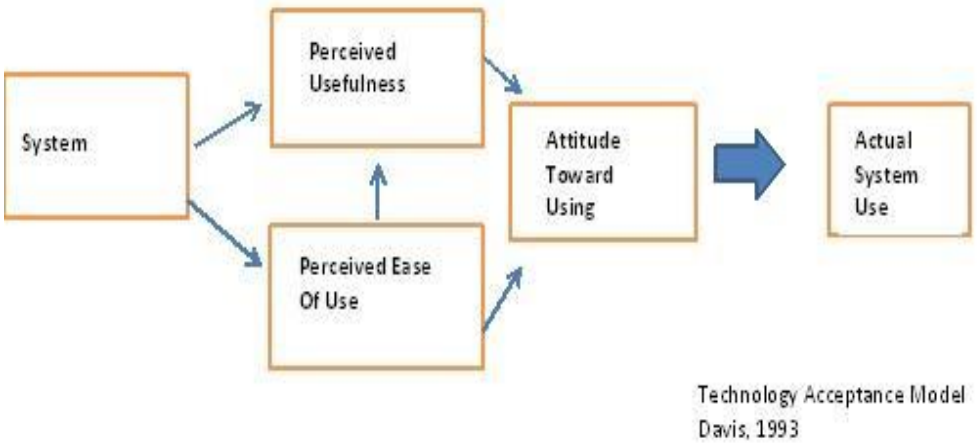



**Figure 2**

| Term | Definition |
|---|---|
| Perceived Usefulness | "The degree to which a person believes that using a particular technology system would enhance his or her job performance" (Davis, 1989) |
| Perceived Ease of Use | "The degree to which a person believes that using a particular system would be free of effort" (Davis, 1989) |
| Attitude Toward Using | "The degree of evaluative effect than an individual associates with using the target system in his or her job" (Davis, 1993, p. 477). |

Though this model seems simple enough, more research should be conducted to determine what the factors are that impact the "perceived usefulness" and "perceived ease of use" of a technology, what these terms mean, and how they impact individuals' ultimate usage of a particular technology. Davis' Technology Acceptance Model (TAM) was originally adapted from and influenced by the Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980) and the Theory of Planned Behavior (TPB) (Ajzen, 1991; 2002). More specifically, the Theory of

Reasoned Action (TRA) informs the concepts behind Davis' (1989; 1993) "Perceived Usefulness" of technology; and the Theory of Planned Behavior (TPB) informs and provides greater context for Davis' (1989; 1993) discussion of the "Perceived Ease of Use" of technology.

One of the strengths of using the Technology Acceptance Model (TAM) for contextualizing teachers' acceptance or rejection of a technology is that it includes both the usability factors of a technology as well as the behavioral, attitudinal factors, or beliefs that may lead a person to accept or reject a particular technology (Holden & Rada, 2011). Therefore, the reasons that teachers reject or accept a technology can be considered in order to understand their instructional decisions in the classroom. This model can be useful in drawing out these specific reasons out so they can be understood, contextualized, and studied further. The relationship between the Theory of Reasoned Action (TRA) (Ajzen & Fishbain, 1980) and the Theory of Planned Behavior (TPB)(Ajzen, 1991) models to the Technology Acceptance Model (TAM) is essential to my study because I utilized the concepts from them to frame the discussion of my data and to provide a deeper context for the broader conceptions of the Technology Acceptance Model (TAM) as it relates to an individual teacher's utilization, adoption, and acceptance or rejection of a new technology. Utilizing the Technology Acceptance Model (TMA) and understanding its components can help to foster an understanding of teachers' beliefs and attitudes towards a particular technology. Because the Theory of Reasoned Action (TRA) and the Theory of Planned Behavior (TPB) are so central to the Technology Acceptance Model (TAM), I am going to discuss each of them first, as well as how they relate to each other, and how they inform the Technology Acceptance Model overall.

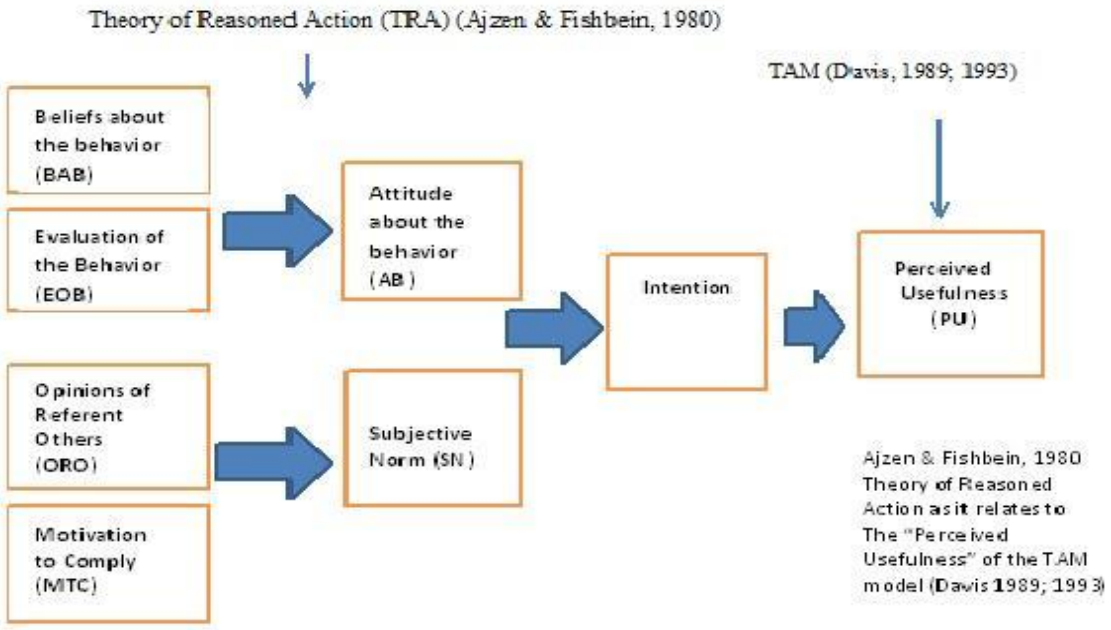
### "Perceived Usefulness" and the influence of the Theory of Reasoned Action (TRA) on the Technology Acceptance Model (TAM)

The "Perceived Usefulness" term in the Technology Acceptance Model (TAM) is derived from and influenced by the Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980). The Theory of Reasoned Action describes that a person's behaviors or intentions are based on their attitudes or "behavioral beliefs" that either positive or negative feelings and experiences will result from a particular behavior (Glanz, Rimer, & Viswanath, 2008, p. 71). These beliefs are also affected by an individual's "Subjective Norm," which is the belief that there are important people associated with them who will approve or disapprove of this behavior. Individuals are also affected by their "motivation to comply" with whether or not these important people in their "subjective norm" approve or disapprove of their behavior and by their need to please them by doing what they feel is expected (Glanz, et al., 2008, p. 71). Below is a chart and terms outlining Theory of Reasoned Action (TRA) model which informs the "Perceived Usefulness" of The Technology Acceptance Model (Ajen & Fishbein, 1980):

**Figure 3**

| **Term** | **Definition** |
|---|---|
| Beliefs about Behavior | Individual's estimated probability that performing the target behavior will result in a consequence |
| Evaluation of the Behavior | Value attached to a behavioral outcome or attribute;<br>Positive or negative judgments about features of the behavior;<br>Contributes to attitude along with behavioral beliefs |
| Opinions of Reverent Others | Important people associated with them who will approve or disapprove of this behavior |
| Motivation to Comply | Motivation to do what salient referents think an individual should do |
| Attitude About the Behavior | behavioral beliefs that either positive or negative feelings and experiences will result from a particular behavior |
| Subjective Norm | Person's perception that most people who are important to him think that he should or should not perform the behavior in question |
| Behavioral Intention | The strength of one's intention to perform a certain behavior |

**Figure 4**




In later versions of the Technology Acceptance Model, Davis dropped "Attitude" as a factor. However, educational research which utilized the Technology Acceptance Model has shown that "attitude" towards technology is an important factor for teacher acceptance of technology and that teachers who have a positive attitude toward technology are more likely to make use of it (Holden & Rada, 2011; Teo, 2010; Yuen & Ma, 2008). Ajzen later expanded on this model and adding the Theory of Planned Behavior (TPB) component to the TPA paradigm (Ajzen, 1991; 2002).

**"Perceived Ease of Use": The influence of the Theory of Planned Behavior (TPB) on the Technology Acceptance Model**

With the Theory of Planned Behavior, Ajzen added the concept that external factors could also potentially impede or facilitate the behavioral intentions that a person may have towards

adopting a technology. Below is an image of the Theory of Planned Behavior paradigm and terms relative to its use:

**Figure 5**

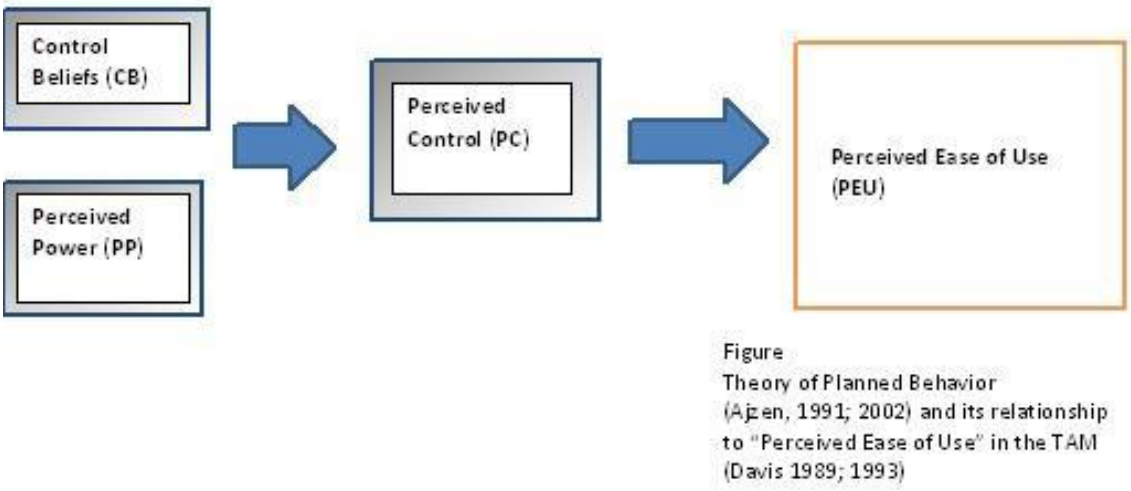



Figure
Theory of Planned Behavior (Ajzen, 1991; 2002) and its relationship to "Perceived Ease of Use" in the TAM (Davis 1989; 1993)

**Figure 6**

| | |
|---|---|
| Control Beliefs: | Factors which help to facilitate the accomplishment or inhibit the accomplishment of a behavior |
| a) Actual | The "actual" behavioral control implies that a person has real access to resources that they need to carry out their intended behavior. |
| b) Perceived | The "perceived behavioral control" has more psychological ramifications, and "refers to people's perception of the ease or difficulty of performing the behavior of interest" |
| Perceived Power | Individual's belief that he or she can have control over the obstacles or factors that help to facilitate the behavior. |
| Perceived Control | Belief that people's behavior is strongly influenced by their confidence in their ability to perform it |

The Theory of Planned Behavior (TPB) model assumes that people not only have the intention to perform a behavior as described in the Theory of Reasoned Action (TRA) model (discussed in the previous section), but also that they have the resources and the opportunity to carry their

intentions out; these opportunities can be both "actual" and "perceived" behavioral controls (Ajzen, 2002, p. 183). The "actual" behavioral control implies that a person has real access to resources that they need to carry out their intended behavior. The "perceived behavioral control" has more psychological ramifications, and "refers to people's perception of the ease or difficulty of performing the behavior of interest" (Ajzen, 2002, p. 183). The concept of "perceived behavior control" in the Theory of Planned Behavior model is very much aligned with the concept of "self-efficacy" and the "belief that people's behavior is strongly influenced by their confidence in their ability to perform it" (Ajzen, 2002, p. 184). With technology acceptance, self-efficacy can impact a person's technology use, and positive interactions with technology can also impact a person's feelings of self-efficacy (Yuen & Ma, 2008). Perceived Behavior control can also be placed in the "more general framework of the relations among beliefs, attitudes, intentions, and behavior" (Ajzen, 2002, p. 184). This perception of "ease or difficulty of performing a behavior" is central to Davis' (1989; 2002) Technology Acceptance Model as it relates to technology adoption. Davis (1989) defines "perceived ease of use" as "the degree to which a person believes that using a particular system would be free of effort (p. 3). This could include the degree of the users' perceived understanding, mental effort, ease of use, and flexibility of a particular technology (Davis, 1989).

It is also important to understand the two concepts that describe an individual's "perceived behavioral control": "control beliefs" and "perceived power" (Glanz, Rimer, & Viswanath, 2008, p 68.). "Control beliefs" are factors which help to facilitate the accomplishment or inhibit the accomplishment of a behavior (Glanz, Rimer, & Viswanath, 2008). The "perceived power" is an individual's belief that he or she can have control over the obstacles or factors that help to facilitate the behavior. Together both the Theory of Reasoned

Action (TRA) and the Theory of Planned Behavior (TPB) influenced Davis' (1989; 1993) Technology Acceptance Model.

The Technology Acceptance Model uses the Theory of Reasoned Action as a basis for explaining the connections between the perceived usefulness and the perceived ease of use of the technology and the technology users' attitudes and intentions for wanting to use the technology (Teo, 2010). The Technology Acceptance Model implies that technology users will have a better attitude towards the technology when they perceive it as being useful and easy to utilize (Teo, 2010). Below is what the TRA could look like if it were to be combined with the TPB model (Glanz, Rimer, & Viswanath, 2008). The TRA model is outlined in orange and the added TPB model which was added by Ajzen in 1991 (Glanz, Rimer, & Viswanath, 2008) is in the blue and gray outlined boxes:

**Figure 7**

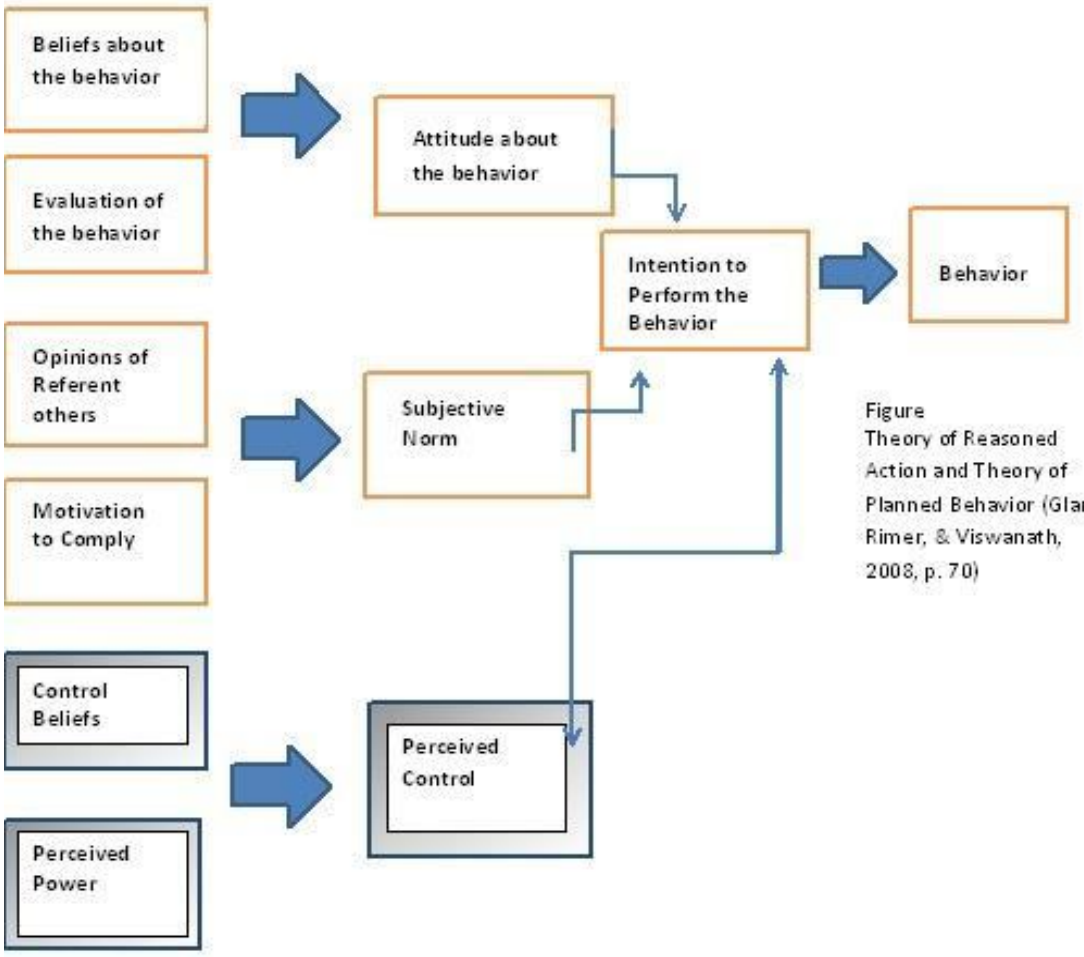



Figure
Theory of Reasoned Action and Theory of Planned Behavior (Glanz, Rimer, & Viswanath, 2008, p. 70)

Within my Methods section, I will further describe how the TAM was used to analyze my data and how the terms and concepts described in the TRA and TPB models may provided useful codes when organizing my findings. I used the TAM, with its emphasis on why technology users decide to accept or reject a particular technology, to provide insights into two components of my research questions: “What beliefs do teachers have about how multimedia can be used in classroom teaching?” and “How does what the teachers learn about multimedia influence their ability to infuse multimedia into their lessons?” Both may be understood through the lens of the

"Perceived Usefulness" of and the "Perceived Ease of Use" as described in the Technology Acceptance Model (TAM).

**Common Cores State Standards (CCSS) Initiative**

The scope of the Common Core State Standards is large and it is not the focus of this study; however, the background of the Common Core State Standards and adoption and the assessments that are tied to the CCSS are relevant to my study as they provide context for how this initiative has impacted teachers. As with other education initiatives in the past, the adoption and subsequent implementation of the Common Core State Standards initiative also led to the need for many states and schools across the United States, including in New Jersey where this study took place, to change their curriculum and assessments as well as their teacher evaluation systems (Xu & Cepa, 2018).

The assessments that are tied to the CCSS, the Smarter Balanced Assessments (SBAC) and the Partnership for Assessment of Readiness For College and Careers (PARCC) which many states, including New Jersey, had adopted, also specifically include multimedia texts. This inclusion of multimedia into the Common Core literacy standards as well as in the associated standardized assessments gives increased pressure for students to acquire proficiency in reading and writing multimedia texts. These assessments were administered by many states during the 2014-2015; 2015-2016; 2016-2017; and 2017-2018 school years to millions of students in grades 3-11. Specifically, New Jersey required the administration of the PARCC assessments for grades 3-11 in all of those school years, and high school students were required to pass the PARCC or an approved alternative assessment in order to graduate (DeNisco, 2017).

The assessments caused another shift because they are administered on the computer. This has not only forced many schools to invest in technology, but also to shift to more

technologically-oriented instruction in order to prepare students for these online assessments. The inclusion of certain skills in a standardized assessment can strongly impact instruction because it can influence how curriculum will be delivered by schools that will try to prepare students for these tests (Herman & Linn, 2013). Therefore, it is important to understand what teachers believe about multimedia, since their beliefs may impact what they teach.

The CCSS initiative, as well as the creation and administration of aligned assessments has been surrounded by controversy, and there has been much political debate and pushback by parents regarding the CCSS and the aligned assessments since its inception (Xu & Cepa, 2018). Supporters and detractors of the initiative disagree about many things, including quality of the standards and the overall effectiveness of the initiative (Xu & Cepa, 2018). Some of what fueled the debate was the perceived politicization and privatization of the Common Core State Standards once states began to participate in the "Race to the Top" program in 2009, whereby states were offered grants by the federal government and private industry, including the Gates Foundation, if they would adopt the Common Core State Standards. Many states adopted the standards just to be eligible for this increase in funds (MacNeil-Dobbins & Bentsen, 2014; Miller & Hanna, 2014). Among the criteria for being eligible for federal funds was that states had to adopt the Common Core standards, participate in an overhaul of the teacher evaluation system, and have a standardized assessment which is aligned to the standards which teachers would be held accountable for as part of their annual evaluation (MacNeil-Dobbins & Bentsen, 2014; Miller & Hanna, 2014). Therefore, there is more to the CCSS than just the standards, since its implementation, in some states, including New Jersey where this study took place, has also been tied to high stakes testing and teacher evaluation.

This controversy caused many of the 42 states that initially adopted the standards, including New Jersey, to further evaluate the continued role of the CCSS in schools. By the time that this study was completed, the backlash towards the CCSS initiative led to many states trying to revise or rebrand their connection to this initiative (DeNisco, 2017). Of the original 42 states, 8 states dropped the CCSS, 21 revised or renamed the standards to make them more of their own, and 17 made no changes (DeNisco, 2017). However, a study conducted by Abt Associates, an international research firm, showed that only minor changes were made to the standards by states that chose to revise them and that the original standards were kept mostly intact (DeNisco, 2017). DeNisco (2017) cites Jill Norton, principal associate of social and economic policy at Abt Associates as stating "most states are still using Common Core, or a version of Common Core standards" (Simple Changes section, para 5).

New Jersey was one of the states that revised and renamed the Common Core State Standards in 2016. The name of the standards was changed to "The New Jersey Student Learning Standards" (NJSLS). As was noted in the Abt Associates study, the revisions to the CCSS were minor. There were 230 changes to the 1,427 Common Core standards the State of New Jersey used to guide math and English education from kindergarten through high school, most of which slightly adjusted wording or added further clarification to the standard (Clark, 2016). A "Crosswalk" was provided to teachers to demonstrate changes in wording to the standards. As can be seen in the Crosswalk, only minor revisions were made to the standards which include multimedia, and none of the revisions change the context of the standard.

The PARCC assessments have also been renamed in New Jersey, though at the time this study was completed, the State of New Jersey was in the process of studying what final changes may be needed to the state testing requirements. Though the newly elected New Jersey

Governor, Phil Murphy, ran on a platform which included repealing the PARCC testing, the state legislature stated it would like to see empirical data and to have more study before any further changes are made to state testing in order to continue to comply with federal regulations under the ESSA law (Adely, 2018). To date, only the name and the length of the test have changed in order to avoid additional negative connotations that were associated with the Common Core State Standards and the PARCC testing. The standards are now called the New Jersey Student Learning Standards and the test is now known as the New Jersey Student Learning Assessments (NJSLA) (Lowe, 2018).

**Multimedia and the CCSS Assessments**

Within the PARCC assessments, multimedia texts are utilized within the reading and writing assessments of the test. The ability to read and utilize different kinds of texts (including multimedia texts) in an argument has been cited by the Partnership for College and Career Readiness as an important college and workplace skill:

> Students read passages from real texts — fiction and non-fiction, and sometimes watch video or listen to audio. They write, using what they've learned from the passages and multi-media to support their arguments. These skills are critically important for students in college and in the workplace. In the past, students have typically been asked to write only once in each grade span — in elementary, middle, and high school. PARCC measures writing at every grade because it is key to showing readiness for the next academic work, and in high school, readiness for college and career (A Different Kind of Test section, para. 5).

Similarly, the Smarter Balanced Consortium Assessment also incorporates multimedia texts into the assessments, citing that the ability to analyze multiple texts is a necessary skill for college and career readiness:

> The domain of performance assessment is quite broad, encompassing a range of non–selected response tasks. A Smarter Balanced performance task involves significant interaction of students with stimulus materials and/or engagement in a problem solution, ultimately leading to an exhibition of the students' application of knowledge and skills, often in writing or spoken language. Stimuli include a variety of information forms (e.g., readings, video clips, data), as well as an assignment or problem situation. A key component of college and career readiness is the ability to integrate knowledge and skills across multiple content standards. Smarter Balanced will address this ability through performance tasks, because it cannot be adequately assessed with selected-response or constructed-response items (Smarter Balanced Assessment Consortium: Performance Task Specifications, 2012, p. 3, para. 2).

At the crux of the debate and controversy of the implementation of the CCSS is the lack of professional development teachers have had regarding the CCSS and how this will potentially impede the implementation of the standards into classroom instruction. Many teachers feel they have lacked the training and understanding needed to implement the standards successfully (Jenkins & Agamba, 2013).

**The Potential Impact of Professional Development**

Research shows that effective teacher professional development has the potential to increase student achievement, improve classroom instruction, and enhance teacher knowledge and skills (Borko, 2004; Darling-Hammond, et al., 2009; Yoon, Duncan, Lee, Scarloss, &

Shapley, 2007). There are many contexts in which to carry out teacher professional development including professional development seminars offered in and outside of schools, as well as university level courses for teachers and pre-service teachers (Avalos, 2011; Borko, 2004; Gibson & Skaalid, 2004). My focus was on the role that professional development through a university-based online course could have on teacher beliefs with regard to multimedia technology. In addition, my study provides further insight into how university courses and teacher training through these courses provide teacher professional development on multimedia technology.

**Professional Development, Educational Reform, and the CCSS**

Because of the emphasis in schools to improve upon students' 21st Century Skills, there has been a push to increase the exposure of students to technology, which has in turn, required teachers to be proficient at teaching technology-related literacies (Boling & Beatty, 2014). With the shift to the more rigorous Common Core State Standards (CCSS) in 2010, states were faced with increased challenges to prepare teachers for these changes through effective professional development opportunities (Marrongelle, Sztajn, & Smith, 2013). Research shows that the effectiveness of any educational reform movement is dependent on teachers' ability to articulate that vision, and that professional development is an important factor to help facilitate educational transitions (Borko, 2004; Darling-Hammond, et al., 2009; DeMonte, 2013). Lieberman and Miller (2014) point out that federally mandated school reforms, and the call for improved teacher professional development have always been "intrinsically related" (p. 1). Both the National Defense and Education Act (1958), and more recently, the No Child Left Behind Act (2001), were passed with the goal to better ensure America's competitiveness in the world (Lieberman & Miller, 2014).

The development and adoption of the Common Core State Standards by 42 states was one of the latest reform movements to attempt to address student preparedness for college and careers. Though not federally mandated, states had the option to adopt the CCSS to compete for federal funds through the Race to the Top grant initiative (Severns, Benjamin, Jackson, Dovere, & Socolow, 2014; Strauss, 2014). The adoption of the CCSS, along with a standardized assessment linked to teacher accountability, also qualified states to achieve waivers from the punitive measures of the No Child Left Behind Act, which was requiring public school students to achieve 100% proficiency on standardized test scores by 2016 (Severns, et al., 2014; Strauss, 2014). New Jersey was one of the coalition of states which helped to form and adopt the CCSS in 2010.

Like other reform movements, the call for professional development for teachers to improve instruction is linked. However, with regard to professional development for the CCSS, not enough has been done to prepare teachers for its implementation (Hirsch, et al., 2012). The degree of controversy surrounding the Common Core State Standards varies from state to state, but the lack of certainty of the validity of this initiative, the cost of the assessments and implementation, and some states push to have local control over schools and assessments, has caused confusion and frustration for some educators (Gewertz & Ujifusa, 2014).

The need for effective professional development is imminent given the large scope of these changes throughout the country and the impact that the Common Core State Standards are having overall on curriculum, assessment, and pedagogy (Marrongelle, et al., 2013). However, in general, most professional development experiences for teachers lack the focus, direction, and continuity that are needed to be meaningful and impactful for teachers (Borko, 2004; Gulamhussein, 2013; DeMonte, 2013; Yoon, et al., 2007). Most teacher professional

development consists of short (1-2 hours), single workshops that have little to no effect on teachers' practice ( Borko, 2004; Darling-Hammond et al., 2009). Research shows that in order for professional development to have any impact on teachers' beliefs and instructional practice, there needs to be more than 14 hours of professional development that is content-focused, sustained, or based on valid theories of curriculum and instruction for it to have any effect (DeMonte, 2013; Yoon, et al., 2007). Significant gains in student achievement were seen in research studies where teachers received 30 to 100 hours of professional development over a 6 month to 1 year duration (Yoon, et al., 2007).

The most effective professional development supports teachers as they learn a particular pedagogical skill, or where they are immersed in learning strategies relating to their content (Darling-Hammond, et al., 2009). Easton (2008) argued that focusing on "professional learning" as opposed to "professional development" is necessary in order for teachers to change and that it is important for teachers to become learners and to be "self-developing" in order to achieve real growth as educators (p. 756). For me, teachers' professional development through a university-based course constitutes a "professional learning" experience if the outcome of the experience is that teachers can continue to be "self-developing" as a result of what they have learned. One means of offering a more sustained professional development experience where teachers can learn independently is through university-based online courses.

**University-Based Online Courses**

The ability to offer online professional development to teachers has led to the development of technologically-enhanced learning environments and flexible accessibility (Lieberman & Miller, 2014). Online courses also enable the opportunity to model the use of various technology tools and demonstrate their pedagogical usefulness to teachers (Ching &

Hursh, 2014). One of the limits of online professional development courses offered through universities is that they are not contextualized in a specific school environment where the teachers work. However, there is the potential to use these courses to prepare teachers for utilizing technology in their own teaching environments (Ching & Hursh, 2014).

Despite the potential for offering professional development to teachers online, there needs to be more research on how this may impact teacher practice (Dash, de Kramer, O'Dwyer, Masters, & Russell, 2012). Dash, et al.'s (2012) study on the "Impact of Online Professional Development on Teacher Quality and Student Achievement in Fifth Grade Mathematics" demonstrated that university-based online professional development courses can have an impact on teachers' pedagogical content knowledge and teaching practice. It is the ultimate goal of any professional development program to ensure that it has an impact on how teachers approach their pedagogy, and ultimately impact student learning. Though my study did not look at the impact on students, it did look at the impact on teachers' beliefs, which is one of the factors that can lead to change in teachers' practice.

This study seeks to fill some of gaps in the research on the impact of professional development on teacher practice (Dash, de Kramer, O'Dwyer, Masters, & Russell, 2012), specifically with multimedia technology. It also seeks to contribute to the research on the beliefs teachers have about multimedia technology. Though research shows teachers' beliefs impact teachers' integration of multimedia technology (Antonietti and Giorgetti, 2006), there needs to be more research on what these beliefs are, and what beliefs or experiences help or hinder their ability to implement multimedia technology. In addition, this study will provide insight into the effectiveness of a professional development experience for teachers through an online graduate course. Though the research discusses university courses as a possible form of professional

development for teachers (Gibson, S., & Skaalid, B. (2004), there is little research on its effectiveness, specifically with regard to multimedia technology.

# CHAPTER 3

## *METHODOLOGY*

For the purpose of this study, I chose to utilize a "bounded, within-site, multi-case study" approach (Creswell, 1998, p. 61; Cresswell, 2013). According to Cresswell (2013), this case study method enables the researcher to explore "a real-life, contemporary bounded system (a case) or multiple bounded systems (cases) over time, through detailed, in-depth data collection involving multiple sources of information… and reports a case description and case themes" (Creswell, 2013, p. 97). Using this bounded, multi-case method enabled me to examine each case individually as well as to analyze the similarities and differences in a "cross-case analysis" (Cresswell & Poth, 2017, p.102) between each of the participants in my study. The purpose of this study was to contribute to the research on

The participants of my study included four Graduate Education Students who took the online graduate course in educational technology called "Web-Based Multimedia Design for Educators" between the years of 2012 and 2013 at Rutgers University. Each of the participants in the study were chosen because they were teaching in disciplines which were required to teach the literacy standards as outlined in the Common Core State Standards for New Jersey at the time of the study. I wanted to include teachers in the study who taught at the elementary, middle school, or high school level and whom taught either language arts, social studies, and science, because all of these subjects and grade levels include multimedia in the required literacy standards in the state of New Jersey.

The "Web-Based Multimedia Design for Educators" course at Rutgers University is the second course within a three-course online Graduate Certificate Program in Educational Technology. The overall stated purpose of the three courses is to "prepare educators to

effectively integrate current and developing technologies into various educational environments, and to serve a wide audience throughout New Jersey thereby helping schools and workforce development systems keep pace with technological innovations" (Rutgers University Graduate School of Education, 2018). I was most interested in studying the second course in the certificate program called Web-Based Multimedia Design for Educators because of its specific focus on multimedia technology.

I wanted to study this course as a form of professional development to determine if it had an impact on teachers' beliefs about multimedia and how they would approach their implementation of multimedia into their instruction. I was also interested in studying if what they learned through this university-based professional development would influence how the teachers in the course interpreted and articulated the Common Core State Standards for literacy, which included multimedia. Within the context of this course, I was interested in studying what the participants' beliefs were about multimedia technology and literacy. I also wanted to study if the professional development received through the course impacted the way they think about multimedia, its purpose in classroom instruction, and if the course helped to influence their beliefs about their own efficacy to implement multimedia technology into their classroom instruction.

All four of the teachers who participated in this study had already taken the first course of the certificate program called "Introduction to Teaching with Digital Tools." The purpose of this introductory course is "to help educators develop proficiency in educational technology and address the challenges of preparing learners for the demands of our information rich, Digital Age society." The teachers in my study took this introductory course prior to taking the "Web-Based Media Design for Educators" course, giving them a basic foundation of overall Web 2.0

technology tools. At the time of this study, none of the students had taken the third course in the certificate program called "Developing Digital eLearning Environments," which focuses on the "theory and practice related to distance, eLearning education."

The "Web-Based Multimedia Design for Educators" course was not specifically designed from a literacy perspective, nor was it specifically aligned to the Common Core State Standards, which had been adopted by New Jersey in 2010. However, since the infusion of multimedia into the Common Core State Standards was part of a new federal and state initiative, I wanted to study if and how the teachers interpreted and infused the CCSS multimedia literacy standards, which were relatively new at the time that the study began, into their lessons within their teaching content areas. I also wanted to study what impact, if any, their professional development through this course had over time and I continued to follow up with the participants through interviews and surveys up to 5 years after they had taken the "Web-Based Multimedia Design for Educators" course.

**Research Questions**

This study aimed to meet the following research questions:

1. What beliefs do teachers have regarding multimedia and literacy?
2. How does teacher professional development in a graduate course on web-based multimedia instruction impact the way they think about multimedia and its purpose in classroom instruction?
    a. How does what the teachers learn about multimedia influence their efficacy to infuse multimedia into their lessons?
    b. How does what they learn influence their view of how multimedia can be interpreted and articulated to meet the Common Core State Standards.

**Researcher Role**

The Graduate School of Education at Rutgers University was awarded a grant by the Verizon Foundation in 2009 to develop a three-course online certificate program to provide training for teachers in 21st Century education. The second course of the certificate program,

"Web-Based Multimedia Design for Educators," is an online course available to graduate education students who are interested in using multimedia technology to facilitate, support, and enhance student learning. At the time the course was originated in 2009, I participated with members of the "Project 21" research team to provide input into the development of the course, including helping to choose readings and to create possible projects and discussion questions, but I have never personally taught the course. Since this course is only considered a requirement for participants enrolled in the Educational Technology certificate program, it could sometimes have small enrollment numbers, and at the time of the study averaged about 12 students per semester. With this in mind, I decided to try and recruit teachers over multiple semesters to better ensure a greater variety of teachers and to ensure representation of teachers who taught at different grade levels and who also taught language arts, science or social studies.

Once I received Institutional Review Board (IRB) approval in 2012, I had the opportunity to recruit teachers from the 2012-2013 semesters. Overall, I was able to recruit four participants who fit my study criteria. These four teachers taught elementary, middle school, or high school students in subject areas that included the Common Core state Standards for literacy, including language arts, social studies and science. For the purpose of this study, I used pseudonyms to protect their identity. Specifically "Lisa," who took the course in the spring semester of 2012, taught 5th grade language arts and social studies; " "Cathy," who took the course in the Summer of 2012, taught middle school language arts; "Brianna," who took the course in the Spring of 2013, taught middle school social studies; and "Shelly," who took the course in the Summer of 2013, taught high school science.

**Site Selection**

I chose to conduct my study within the "Web-Based Multimedia Design for Educators" online course at Rutgers University because it was specifically designed for educators, especially those teaching in grades K-12, who had an interest in learning about multimedia technology and how they could infuse it into their teaching. The Web-Based Multimedia Design for Educators provided a quality, intensive, professional development experience for teachers. According to Yoon et al. (2007), professional development is most effective when it is sustained, requires active participation and active learning from the participants, and which has a specific content focus. This course met all of those criteria. While participating in this course, the teachers who enrolled had various opportunities to engage in both individual and collaborative activities that emphasized learning through design and inquiry. The course was also designed to engage teachers in the learning of multimedia technology and to experience it in a way that would facilitate their use of it in their classroom teaching to support their own students' learning. I felt this course design and its sole focus on multimedia technology would help to facilitate my ability to research the teachers' beliefs about multimedia, as well as to study the overall impact of this professional development experience on their ability to articulate multimedia into their instruction to meet the literacy standards in their respective subject areas.

Students were made aware of this course through the online registration system of listed course offerings and electives as well as by an email to all graduate students in the Graduate School of Education program at Rutgers University. I recruited students for this study by contacting the professor of the course and requesting that she send an invitation about my study to any student in the class who was a K-12 educator who teaches either English/Language Arts, Social Studies or Science. I chose teachers in these content areas because these content areas are also covered in the CCSS literacy standards. Students who were interested filled out the consent

form through an online format on Qualtrics.com. The instructor did not know who gave consent, and the students were made aware that participating or not participating would have no impact on their participation and grade in the course.

*Participants*

Since my criteria for participants was limited to K-12 educators whose content included literacy, I felt the need to try and recruit participants from multiple courses in multiple semesters to ensure I had a "purposeful sampling" (Cresswell &Poth, 2017, p. 100) of participants. I also wanted to recruit teachers from multiple content areas that included multimedia in the literacy standards and teachers who worked with different grade levels. I felt this would best ensure that there was a "purposeful maximal sampling" (Cresswell & Poth, 2017, p. 100) of cases that "show different perspectives on the problem" (Cresswell & Poth, 2017, p 100), and which would yield the most informative data. This included English/Language Arts teachers as well as teachers who taught Social Studies, or Science. The goal of the study was to determine their beliefs about multimedia as well as the influence that taking a graduate course about multimedia had on their beliefs and their intended instructional practices with regard to the CCSS that included multimedia.

*Participant Selection*

After receiving IRB approval to conduct my study, I had the opportunity to recruit four participants from the Spring 2012, Summer 2012, Spring 2013 and Summer 2013 semesters of the "Web-Based Multimedia Design for Educators" course. Students were selected from these courses based on their status as K-12 public school teachers. Focus was placed on recruiting teachers whose content area also included the CCSS for literacy; they also expressed an interest in being able to utilize multimedia in their classroom teaching. The subject areas that were most

desired included K-12 English/Language arts; K-12 Science; and K-12 Social Studies, since these were the areas where the literacy standards of the CCSS were emphasized and required in the curriculum for the State of New Jersey at the time of the study.

At the time I was recruiting participants, there was one section of the "Web-based Multimedia Design for Educators" course being offered in any given semester; and because it was a new course at the time the study began, the exact enrollment was hard to predict. The courses I selected yielded four participants who fit my criteria. According to Yin (2014) four or five participants in a case study provides sufficient data to identify themes and to make comparisons through a cross-case analysis (as cited in Cresswell & Poth, 2017, p. 159). The participants are described in the section below, and have been assigned pseudonyms to protect their identity and privacy (Cresswell & Poth, 2017).

*Participant 1, "Lisa"* had been teaching for over 25 years in a New Jersey public school district. She taught middle school Language Arts and Social Studies. She stated in the pre-course survey that was interested in taking the course "because of the present influence of technology on our youth" and because she wanted to "be able to connect their knowledge of technological devices to academic learning." She described the need for educators to understand where multimedia fits into the Common Core State Standards as "extremely important."

*Participant 2* "Cathy" had been teaching for over 12 years, seven of which were spent in New Jersey teaching 5th grade Language Arts and Social Studies. She described in the pre-course survey that she wanted to take the "Web-based Multimedia Design for Educators" course because she would "like to use these techniques in my classroom not only as a means to deliver instruction but also to teach these techniques for student use." She described the need for

educators to understand where multimedia fits into the Common Core State Standards as "very important."

*Participant 3*, "Brianna" had been teaching for 11 years and had spent 6 years teaching Social Studies at the 6, 7 and 8th grade level. She stated in the pre-course survey that she enrolled in the course to "gain a deeper understanding of the resources available online and how to utilize them within [her] classroom on a frequent basis." She also added in that survey that her "school district does not offer much in the way of in-house training" and that she wanted to ensure that she was "aware of and proficient in the newest technologies available to help with my profession." She felt it was "extremely important" that educators understand where multimedia fits into the Common Core State Standards.

*Participant 4*, "Shelly" had been a teacher for 20 years, and she taught high school physical science, biology, and physics. In the pre-course survey, she stated she took the course because she was interested in improving students 21st Century technology skills and believed that multimedia was easy to learn and accessible to students. She felt it was "very important" that educators should understand where multimedia fit into the Common Core State Standards.

***Data Collection***

Cresswell and Poth (2017) emphasize the importance of collecting data from multiple sources when conducting a case study. Data were collected from multiple sources including interviews conducted during the course (pre-course, middle of the course and after the course); course artifacts including a pre-course survey given by the instructor; online discussions; course assignments and projects (See Appendix B); and follow-up interviews and surveys directly after the course was over. In addition, I also expanded my study beyond the course and obtained IRB

approval to obtain additional data from my participants up to five years after they had taken the "Web-Based Multimedia Design Course."

Data were also collected from post-course interviews and surveys in 2016 and in 2017 as follow-up data from the course to see if the participants believed there was any long-term impact that could be determined from taking the course (See Appendix B). I wanted this perspective since much of the research regarding teacher professional development shows that there is often no lasting impact of what teachers learn from professional development opportunities unless the experience was sustained for longer than 14 hours over time (DeMonte, 2013; Yoon, et al., 2007). I also wanted to continue to study what impact, if any, their post-course experiences and beliefs had on fulfilling the Common Core State Standard requirements as well as their personal experiences with the CCSS accompanying PARCC assessments, since this initiative was ongoing in the state of New Jersey at the time of my study.

There were three projects that the students participated in during the course which were collected and analyzed: the "Multimedia Montage Project"; the "Mixed Digital Media Critique (MDMC); and "Mini Art School." The Multimedia Montage Project consisted of participating in the creation of a "multimedia library" collection of free web 2.0 tools "that promote creativity, collaboration and communication in educational settings [and] can easily be used to transform the learning environment." The Mixed Digital Media Critique (MDMC) project required students to research and learn several web 2.0 tools and to reflect on if the tools were effective within an educational setting. The "Mini Art School" project required students to read about and to blog about their experiences trying to apply various design principles of multimedia. The data from each of these class assignments were analyzed and coded (Cresswell, 1998).

***Data Analysis***

The methodology for data analysis included deductive reasoning, inductive reasoning, and applying the concepts and theories derived from the literature (Miles & Huberman, 1994). The strategies I utilized included jotting, writing memos, making summary sheets, and creating data charts and writing observations after interviewing the participants and reviewing artifacts (Cresswell & Poth, 2017). Dedoose software was used to help with "file management and analysis tasks" (Cresswell & Poth, 2017 p. 186). This included uploading course artifacts, interviews, audio and video files, and organizing and storing data. This software also helped to facilitate and capture written analysis such as memos and the coding of data. I analyzed the data of each of the participants utilizing the concepts from my theoretical framework and literature. Next, I began to form "codes or categories" (Cresswell & Poth 2017, p. 189) based on my interpretation of the data. In the data analysis process, this enabled me to determine the emerging "themes" or "categories." which are "broad units of information that consist of several codes, aggregated to form a common idea" (Cresswell & Poth, 2017, p. 194). stemming from the data.

For example, in order to answer the research question "How does teacher professional development in a graduate course on web-based multimedia instruction impact the way the teachers think about multimedia and its purpose in classroom instruction," the course objective, assignments, and the artifacts that the participants produced in the "Web-Based Multimedia Design for Educators" course were collected and analyzed. For the purpose of this study, the word "impact" referred to the participants' beliefs about how the course helped them in their own learning and practice as well as their "behavioral intention to use" what they learned about multimedia technology in their teaching practice (Holden & Rada, 2011).

According to Fishbein and Ajzen's Theory of Reasoned Action (1975), "behavioral intention" is defined as "an individual's subjective probability that he or she will perform a

specified behavior" (p. 288). For the purpose of this study, the specified behavior was the participants' intention to use multimedia in their teaching practice based on their belief that multimedia had a useful purpose in their classroom instruction. For example, as Davis (1989; 1993) explains in the TAM, before individuals will adopt a technology ("Actual System Use"), their "attitude" toward using the technology will factor in. The individual's attitude toward the technology is impacted by the individual's (in this case the teachers') perception of the technology's "Perceived Usefulness" and the technology's "Perceived Ease of Use."

In order to answer the research question "How does what the teachers learn about multimedia influence their efficacy to infuse multimedia into their lessons?" the course objective, assignments, and the artifacts that the participants produced in the "Web-Based Multimedia Design" course were analyzed. For the purpose of this study, "efficacy" was defined as "one's belief in his or her ability to execute a particular task" (Holden & Rada, 2011, p. 3). For this study, "efficacy" refers to the participant's belief that they could effectively utilize multimedia tools within their classroom instruction.

The chart below contains some excerpts and examples from the codebook I created utilizing information I uploaded into the Dedoose software program. This chart outlines the codes I created based on the criteria and definitions from the Theory of Planned Behavior (TPB) aspect of the Technology Acceptance Model. By applying these concepts to the data, I was able to glean some of the examples of the varying factors that may have helped or inhibited teachers from implementing multimedia into their classroom instruction before, during, and after their participation in the "Web-Based Multimedia Design for Educators" course. I analyzed and coded the data by using the Technology Acceptance Model (TAM) and the concepts from the Theory of Planned Behavior (TPB) which informs the TAM:

| **Code from TAM**<br><br>**Theory of Planned Behavior: "Perceived Ease of Use"** | **Definition** | **My definition as it applies to the participants' experience with multimedia usage/implementation** | **Example from data** | **Emerging themes for Ease of Use for Learning and Implementing Multimedia Tools** |
|---|---|---|---|---|
| Control Beliefs: | Factors which help to facilitate the accomplishment or inhibit the accomplishment of a behavior | Factors which help or inhibit the teacher from implementing multimedia into their instruction. This could include access or support or personal self-efficacy to implement multimedia technology | "standardized assessment does not reflect the real world and real world assignments which are more engaging to students and the teachers are afraid to deviate." Lisa | Impact of state and federal requirements; teachers' control over curriculum/instructional choices |
| a) Actual | The "actual" behavioral control implies that a person has real access to resources that they need to carry out their intended behavior. | The teacher has access to computers, internet and multimedia tools and there is nothing inhibiting the teachers in terms of the schools' technology access/infrastructure | Brianna and Cathy's schools increased students' and teachers' access to technology through 1:1 Chromebook initiatives; according to them, this was a direct result of the requirements of the state PARCC testing and Common Core State Standards initiative. | Access to computers; access to a supported technology infrastructure |
| b) Perceived | The "perceived behavioral control" has | The teacher feels supported in her usage of multimedia | "I did utilize the website, although | Impact of local school's technology requirements/curriculum |

| | | | | |
|---|---|---|---|---|
| | more psychological ramifications, and "refers to people's perception of the ease or difficulty of performing the behavior of interest" | technology and feels as though there is no obstruction if she should want to implement multimedia. This could include district or school support from administrators, curriculum requirements, etc. Or, the teacher feels the implementation will be difficult | eventually had to use the StudyWiz platform as required by my district. The district did not continue to allow us to use teacher created websites outside of StudyWiz" Lisa | on lack of teachers' control over choices of multimedia tools |
| Perceived Power | Individual's belief that he or she can have control over the obstacles or factors that help to facilitate the behavior. | The teacher feels that any obstacle to implementing multimedia technology can ultimately be resolved or overcome by her own actions and choices or cannot because of restrictions and a lack of power over instruction | "My school district does not offer much in the way of in-house training, and I want to ensure that I am aware of and proficient in the newest technologies available to help with my profession." Brianna | lack of school support; Self-empowerment by seeking outside resources through professional development |
| Perceived Control | Belief that people's behavior is strongly influenced by their confidence in their ability to perform it | The teacher feels she has the self-efficacy, knowledge and ability to implement multimedia into her instruction | "Before I didn't feel comfortable enough to assign that because I didn't know how to do it, now I can say 'alright, I know this is possible'" Shelly | Increased self-efficacy through taking a university based professional development offering; |

Similarly, when looking at a teacher's beliefs about the "Perceived Usefulness" of multimedia technology, I turned to the concepts described in the Theory of Reasoned Action (TRA) model to analyze and code the teachers' beliefs about multimedia which were part of my research questions, "What beliefs do teachers have about how multimedia can be used in classroom teaching?" and "How does what the teachers learn about multimedia influence their ability to infuse multimedia into their lessons?" The concepts in the TRA model helped to provide useful codes to describe the factors that determined the teacher's beliefs about multimedia technology, including their interpretation of how multimedia fit into the literacy standards of the CCSS. The two major concepts in the TRA model that informed "Perceived Usefulness" of the multimedia technology included the factors around "attitude" and "subjective norm." In the TRA model (Ajzen & Fishbein, 1980), an individual's "attitude" toward a behavior includes their "beliefs about the behavior" and their "evaluation of the behavior." The "subjective norm" includes their "normative beliefs" and their "motivation to comply.

In addition to these examples, I also created other codes as needed to address additional topics. These included beliefs about multimedia and literacy; the impact of the professional development through the "Web-Based Multimedia Design for Educators" course; teachers' efficacy to utilize multimedia tools; and teachers' interpretation or utilization of the Common Core State Standards for literacy that include multimedia (See Appendix C for additional selected code excerpts). The definitions and terms in the Technology Acceptance Model framework were utilized as well as the literature for multimedia, professional development, and literacy to inform my data analysis when determining and classifying my codes. The conclusions were drawn from the major findings of the study. These findings helped determine the

importance of the study for providing professional development in multimedia technology, the implications for teaching, and the need for continued research in this area.

**Validity and Reliability**

The data collection approach consisted of multiple forms of data including surveys, interviews, and course artifacts to increase the validity of the research (Cresswell & Poth, 2017). To ensure the reliability of the data, several methods were utilized including "member checking, triangulating sources of data and using a peer or external auditor of the account" (Cresswell & Poth, 2017, p. 48). I met with my peer auditor, an expert in the field in multimedia and educational technology, on a bi-weekly basis during 2017 and 2018 to review the use of codes, and the development of themes throughout the data examination process.

**Limitations**

A limitation of this study was that it was based on self-report by teachers and did not include classroom observations or an examination of their students' work that incorporated multimedia technology. In addition, the teachers who participated in this study do not represent a perspective from every subject area or every grade level. Future researchers may want to include teachers at all of the grade levels and subjects that include multimedia in the standards in order to provide a more comprehensive viewpoint. An examination of their students' work would better validate if there was an impact on student learning which resulted from the teachers' implementation of multimedia technology.

The research also does not include data on the effectiveness of specific multimedia technology tools, but rather includes the teachers' beliefs about the effectiveness or "perceived usefulness" and "perceived ease of use" of the tools they experienced. Though teacher beliefs are

an important factor, additional research into the impact of specific multimedia tools on student achievement would also be important.

Because teacher lesson plans and classroom observations were not a part of this study, the impact of the CCSS initiative could not be fully examined beyond the self- report of teachers through survey responses and a listing of how standards would be incorporated into sample lesson plans which were created as a course assignment. Further research could benefit from a closer study of how teachers actually meet the multimedia literacy standards in their instruction. This may include classroom observation as well as analysis of actual lesson plans.

# CHAPTER 4

# FINDINGS

## Introduction

The findings include an interpretation of data collected from four teachers who enrolled in an online graduate class for educators called "Web-Based Multimedia Design for Educators" between the years of 2012 and 2013. The evidence collected, analyzed, and interpreted included teacher interviews, surveys, and course artifacts. Included in this were a follow-up survey which I conducted in 2016 as well as a follow-up interview which took place in 2017. The purpose of these were to determine any long-term impact that the teachers believed resulted from taking the Web-Based Multimedia Design for Educators course up to five years after taking the course. The findings were informed by the concepts of the Technology Acceptance Model as well as research pertaining to teacher beliefs, literacy, professional development, and multimedia technology.

In this chapter, I will discuss the findings that emerged as a result of this study. The analysis of the data enabled me to look at the individual experiences of each of the participants, as well as to determine any common themes across participants (Ayres, Kavanaugh & Knafl, 2003). These findings include a description and analysis of the experiences of each of the four participants. This chapter also includes a discussion around the following themes that emerged when comparing the experiences across the participants: Beliefs about Multimedia and Literacy: "Perceived Usefulness"; Beliefs about Multimedia and Multimedia Tools: "Perceived Ease of Use"; Impact of Sustained, Focused Professional Development; and Impact of State Mandates on Teachers.

The findings of this study were based on the following research questions: 1) What beliefs do teachers have regarding multimedia and literacy?; 2) How does teacher professional

development in a graduate course on web-based multimedia instruction impact the way they think about multimedia and its purpose in classroom instruction?

a. How does what the teachers learn about multimedia influence their efficacy to infuse multimedia into their lessons? b. How does what they learn influence their view of how multimedia can be interpreted and articulated to meet the Common Core State Standards?

**Participant 1: "Lisa"**

Lisa was the first participant to join this study and she took the "Web-Based Multimedia for Educators" course in 2012. She was teaching 5th grade Language Arts and Social Studies at the time she was taking the course. In her response to the pre-course survey, she stated she took the course because she wanted to "use these techniques in my classroom, not only as a means to deliver instruction, but also to teach these techniques for student use." Lisa defined multimedia as "information presented using audio/visual technology either independently, but most likely simultaneously." She also stated her belief that the design of multimedia relates to the "concept behind the presentation--what the author wants the audience to achieve."

She responded that it was "extremely important" for educators to understand where multimedia fits into the literacy standards of the Common Core State Standards and that she felt she knew where multimedia fit into the literacy standards of the Common Core. She felt it was "very important" that educators use multimedia tools in their classroom instruction. She believed that it was "very important" that educators understand the cognitive theories of learning with regard to multimedia. She thought it was "somewhat important" for educators to have an understanding of the basic principles of the design of multimedia, but that it was "very important" for educators to understand how sound, images and design principles apply to the development of multimedia.

In terms of her own efficacy, Lisa expressed in a pre-course survey that she had some knowledge of multimedia tools such as wikis, but wanted to learn more about how she could improve her skills to improve her instruction for students. She believed if she did not find a way to engage her students in ways that they could communicate, that they would not be as engaged in their own learning. She knew the power of technology from her own personal use, and she believed that there were opportunities to learn new technologies that she could leverage in the classroom. In one of her course blogs she wrote at the beginning of the semester she wrote:

> In my personal life, I use technology constantly. As a teacher, I use technology constantly. Although, if someone asked me to create a video showcasing student work, I think I would probably either quickly change the subject or stand with that 'deer in the headlights' look. Sure, I could probably figure it out, but it would not be a comfortable experience. Should this stop me from doing it? No! Because in this day and age, creating a decent and engaging video is no longer for Hollywood. So quite frankly, proficiency is no longer an issue. Most available applications are user friendly, visual and easily transferrable to use on any platform. Now, when someone says, 'I don't know enough about that to use that program' what they really mean is, "I don't want to" or, "I don't want to take the time." Therefore, when it comes to being a leader in technology, proficiency should no longer be an excuse... So, better stop using excuses because soon enough even your students will be able to see through them.

The Theory of Reasoned Action (Ajzen & Fishbein, 1980) as it relates to the Perceived Usefulness component of the TAM model (Davis 1989; 1993), is a useful tool when analyzing Lisa's "Beliefs about Behavior" (Ajzen & Fishbein, 1980) with regard to the implementation of multimedia technology into her instruction. It is clear that Lisa believed that one of the useful

components of multimedia technology was that it could be used to facilitate student engagement and learning.

Within the Theory of Reasoned Action, Lisa's students were the "Reverent Others" (Ajzen & Fishbein, 1980) whom she would like to benefit from her use of multimedia in the classroom. Her beliefs about the "Evaluation of the Behavior" (Ajzen & Fishbein, 1980) of using multimedia in her instruction was that her students were going to be more engaged when she utilized multimedia; that they could relate to their learning more, and that their learning would be improved as a result of using multimedia technology as a classroom tool. Her positive attitude about multimedia technology and the "Perceived Usefulness" (Ajzen & Fishbein, 1980) she felt multimedia technology had, led her to try and implement some of what she was learning in the "Web-Based Multimedia for Educators" course into her teaching.

In an interview while enrolled in the course, Lisa revealed her belief that using multimedia was motivating and good for students' learning. She said she had begun to implement some of the tools she had learned in the "Web-Based Multimedia for Educators" class in her teaching while enrolled in the course. She believed that the course helped her to help her students with reading literacy, especially struggling readers. She stated her belief that as students got older and the textbooks became more text based, that the struggling readers had a harder time making visual connections to what they were reading. She said she helped these students by making podcasts and screencasts with pictures to help students to follow as they were reading in order to help them with comprehension. Though she did not name the standard explicitly, her usage of multimedia met the Speaking and Listening standard for grade 5, SL.5.2.which stated: "Paraphrase portions of a text read aloud or information presented in diverse media and formats (e.g.,visually, quantitatively, and orally)."

With regard to writing instruction, she said she believed the course helped her to think about the visual design of different forms of multimedia-based writing. She worked with students on their ability to analyze different forms of persuasive writing that included multimedia, especially advertisements. She stated she used what she learned in the course to help students to break down how something was designed to enhance the message and to make it more persuasive; and that she encouraged students to use this in their own writing as well. In an online discussion about the uses of online blogging multimedia tools she stated:

> Writing online requires students to practice clarity in writing. Through blogging, or posting on discussion boards, they learn that they need to 'tell all parts of the story' so that someone on the other end 'gets it'. Practicing clarity in writing to communicate will help them to verbalize connections in a digital world where communication is done by means of texting, emailing, instant messaging.

She said she also helped students to think about the design of their PowerPoints that included multimedia and how to put together a combination of visuals, text and music. She believed she could see a difference in the quality of what students produced and in their ability to incorporate multimedia.

In an online class discussion, Lisa stated her belief that using multimedia tools can enhance students' ability to make connections to the content, to facilitate collaboration with other students and to recognize the change in literacy skills that have been brought on by changes in technology:

> Rapid advances in technology enables a teacher to create a space to take learning beyond the walls and back in time - in essence, a time machine. Therefore, using multimedia resources as a platform to teach United States History to 5th graders, students can

> virtually be transported back in time to develop their own philosophies about our their country's history. It is my goal to help students use history as a tool of reference and resource for the purpose of finding solutions for the world they live in. In turn, by putting multimedia in their hands, they can have a voice to ask questions, develop ideas, and share solutions with the global community of their future.

Though she did not state the standard specifically, her classroom writing assignments were consistent with the Common Core Literacy writing standard W5.2 which states: "Write informative/explanatory texts to examine a topic and convey ideas and information clearly. A. Introduce a topic clearly, provide a general observation and focus, and group related information logically; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension." Her application of the Common Core State Standards into her lessons was consistent with her stated belief that she knew where multimedia fit into the Common Core State Standards for literacy.

Lisa also stated her belief that the use of multimedia with her students changed the dynamic in her classroom in terms of increased motivation, better discussions, and higher level questions by students and that using multimedia in lessons enhanced what she described was her district's "prescriptive basil reader and book assessments" that they were using at the time the study began in 2012. She did not believe that the multimedia resources that came with the book in her curriculum were "real world enough or interesting," but there was pressure from the district not to deviate and that all teachers were required to teach the same thing. She said the district felt that the required basal reader was aligned to the Common Core State Standards, even though it was written two years before the Common Core was adopted by New Jersey. She also noted that the Common Core State Standards were not aligned to the New Jersey assessments,

which was the NJ Ask assessment at that time. She expressed frustration that the New Jersey state assessments and her curriculum at that time were not aligned with the Common Core State Standards. She said “one problem with the multimedia standards and the Common Core State Standards is that they are not reflected in the standardized assessments we have right now, the NJ Ask, so the curriculum does not fit the text.” She also stated that the “standardized assessment does not reflect the real world and real world assignments which are more engaging to students and the teachers are afraid to deviate.”

The Common Core PARCC assessment was not given to elementary students in New Jersey until 2014-2015 (State of New Jersey Department of Education, 2017), two years after Lisa had completed the "Web-Based Multimedia for Educators "course. Lisa’s frustration with the beginning of the Common Core State Standards initiative is consistent with the literature regarding the initial roll out of the Common Core State Standards. Her experience demonstrates that teachers’ beliefs about what is best for student learning can clash with expectations outlined by a school district’s curriculum or by school leaders; in addition, she was also feeling frustrated by what she believed was a gap in the expectations for student learning in the Common Core State Standards and what was actually going to be tested on the state assessments, the NJ Ask. This lead her to be in a conflict between wanting to teach what she believed was best for her students, and having to comply with the expectations of her district’s mandated curriculum.

Lisa’s personal beliefs about teaching with multimedia tools also clashed with those of her colleagues. She said their interpretation of multimedia in the Common Core State Standards was to “show a movie” or to make a PowerPoint, but that she had other ideas. When she tried to share her ideas she said they said they did not have time or that their students didn’t have the capability. She said they tried to make their old lessons fit the Common Core State Standards so

they didn't have to change anything and that she "wished everyone had taken the same course so they would be on the same page."

Lisa captured these beliefs in a blog assignment for the course in which she created a fictional conversation between two teachers--one who was reluctant to use multimedia technology, and the other who was trying to help the other teacher understand why its use was good for facilitating student learning. These two fictional teachers reflected the struggle that Lisa believed teachers can have when nervous about adopting multimedia technology or showing a reluctance to change. Lisa also demonstrates many of her beliefs about the benefits of using multimedia technology for students The citations from the course readings in her blog also demonstrate some of the beliefs she has about multimedia and literacy, including that the use of multimedia enabled her to teach students reading and analysis skills; to collaborate and learn from each other; to extend the classroom and engage other people from the outside to enhance student learning; and to meet the Common Core State Standards:

> Well, this week has been kind of challenging for us all. Although in my reflection of blog posts, and discussions, I am finding the challenge to be finding ways to incorporate multimedia into learning. I decided to write a fictional discussion between two teachers that portray one of these challenges...our own hesitations often prevent us to see that multimedia is not just more stuff to do in the classroom, but a better design to engage student learning. Here it goes....
>
> **Mrs. Digita**Today, they are working in teams to research regions of the United States. Tomorrow, we will be using Skype to interview students in New Mexico for a first hand account of that region. I also found some great tourism resources through each state that I put on my website so they can access them as they need. This is really an exciting project.
> **Mrs. Analog:** What's wrong with reading the textbook to learn about the regions and states? I'm giving the test next week. They probably won't do very well on in it…they are just so lazy! When are you giving the test?
> **Mrs. Digital:** My assessment will be a combination of outcomes. They are sharing all their research with their peers through Edmodo. As well, they are asking really great questions on their posts. I can use this question and answer dialog to assess what they are

learning. Once we are done with the research stage, my students will create a video advertisement on a region. It is a very involved project. They are learning so much outside of just learning about the regions, they are learning new tools, planning strategies, reading strategies, how to determine good and bad research – how multimedia is also part of our literate world (Daley, 2003). Literacy is no longer bound merely between two covers, it is visual, auditory…multimodal.

**A:** Oh, I just show a film that covers my multimedia component.

**D:** Well, movies are a good way, to get the students interest. It also depends on how you engage their learning. The visual you choose should be connected in ways that encourage deeper learning; make them think at higher levels (Mayer and Moreno, 1998). Sometimes, I use movie clips to guide this process. Another way, I use multimedia to guide higher level thinking is through the analysis of the author/or artists, use of materials. Such as in art, we looked at a paintings by C. M. Russell to analyze western culture. We determined through his style of painting, what message he was trying to portray. Then we applied that to the region to understand the culture and history of the people of the region. Now, the kids are sharing their own pictures they have collected about their regions, not to mention looking at art and visual images in a different way. Now, they look for the message, not just at the pretty colors and shapes.

**A:** How do you have time for all this fluff? Don't you know we have to get through the curriculum? We have to be done teaching regions by the middle of the month!

**D:** Well, that's just the thing, using multimedia has helped me pack many standards into one unit. That's the beauty of it, when you design your instruction with multimedia in mind, you can address many of the students needs, engage their intelligence, connect their learning through using different forms of media.

**A:** What will you send home to their parents? How will their parents know they have learned?

**D:** Their parents already know what they are learning, they have access to their Edmodo accounts and to the website. The parents often contribute to the students' posts and offer suggestions to solutions. It's great to see the parents get involved! A couple of parents grew up in the south and tell such great stories of their childhood living in a town with segregation. One parent even posted a picture of her mother at the Civil Rights March in Washington D.C.

**A:** But Civil Rights is not in our curriculum! How does that relate?

**D:** Well, no it isn't part of the curriculum, but it is connected to the region of the south. It is their history, our history. See when we connect some of the events to what they are learning, they can connect what they have learned from the text to real events. When they walk away from their project, I know that they have learned, and what they have learned will stick. They know they have learned. So, when I do give the traditional test, I expect they will do well because they have made many connections that reach far beyond the limits of the traditional curriculum.

> **A:** All this sounds like fluff to me, nothing can replace good old traditional book learning. All this multimedia, technology…everything your talking about makes my head spin.
> **D:** If you want, I could help you get started with a small project using a multimedia approach…
> **A:** No way, not me. I could never handle that…plus I have my plans done for the whole year. (Bell Rings) Well, back to chaos!

Lisa believed that incorporating multimedia into her lessons helped students because it was based on their personal experiences with computers and television in their personal lives. She stated in an end-of course interview:

> By using multimedia, I can guide my students to the content instead of myself telling the content. They can access more content than I have time to lecture. Once I began using multimedia techniques in the classroom, teaching became easier and more effective. I'm able to have more students engaged in their own learning and the skills they learned through multimedia helped me to meet many of the Common Core State Standards. They come to expect the use of multimedia in their activities and many times it is more rich.

In the end of the course interview, she stated she implemented the website she created as a project in the "Web-Based Multimedia for Educators" course into her classroom teaching and believed that it motivated her students because it incorporated different videos and information to supplement her textbooks and her curriculum.

In follow up interviews in 2016 and 2017, however, Lisa stated she no longer utilized the website she created in the "Web-Based Multimedia Design for Educators" course because of restrictions by her district which made it difficult to implement teacher-created websites or technological resources, which were not approved by the district. She stated in 2017:

> I did utilize the website, although eventually had to use the StudyWiz platform as required by my district. The district did not continue to allow us to use teacher created

> websites outside of StudyWiz as they feel StudyWiz provides a secure space for kids (elementary students) to access lessons that are free from the general online traffic that could be detrimental to young students.

This limitation by Lisa's district emphasizes that extrinsic forces which impact teachers' instructional decision making have an impact on a teachers' ability to implement multimedia technology, regardless of their own personal beliefs. Though Lisa could have sought out permission from her district to utilize other multimedia technology tools, she described it in her 2017 interview as a difficult process. She also cited that the district had concerns of allowing students access to platforms outside of the StudyWiz software that the district utilized to allow for technology integration in the classroom. Lisa explained that the Studywiz platform was described by her district as a safer choice for younger students to participate in an online platform in a controlled way. Lisa was able to incorporate multimedia tools within this platform which were already built into the software, so she still felt as though she could teach the same skills as she could with outside tools in a safer environment for students.

Little had changed in terms of Lisa's technology usage after taking the "Web-Based Multimedia for Educators "course, even as a result of the PARCC initiative. She stated her district believed in continuing their use of StudyWiz and other technology platforms as well as their overall reading program and that this was enough to address the requirements of the Common Core State Standards. She stated in a post-course interview in 2016:

> My district requires that many written assignments are completed using programs such as Studywiz, Word or Pages. This helps them to prepare for the PARCC testing by practicing keyboarding skills. I also have students respond to video and film related prompts similar to a written prompt which teaches students to apply the same reading

skills or strategies.

She said in a post-course follow-up interview in 2017 that because her district was already ahead technologically compared to other districts when the Common Core State Standards initiative began, they did not change their instructional practices within their curriculum or buy additional devices. She stated:

> the district already had an expensive laptop initiative that began in 2007, which was before the adoption in NJ of the CCSS and it provided students from grades 6-12 with access to MacBooks. The initiative is still in place and the laptops are cycled through and trickle down to the elementary schools where there are 10 MacBook Airs in every class as well as 5 to 7 iPads.

**Participant 2: "Cathy"**

Cathy took the course in the summer of 2012. Compared to the other participants in the study, Cathy's efficacy with multimedia was greater from the beginning of the course. Cathy said that while her principal, supervisor and colleagues would welcome her use of multimedia technology, it was not a requirement in her district. She said she was "aware of how multimedia technology was incorporated into the Common Core State Standards and into the PARCC testing, but that the implementation of the CCSS did not really change what she was doing with technology "except to show... students what the PARCC website looked like."

A middle school language arts teacher and self-described, "millennial," Cathy felt very comfortable using and learning multimedia technology from the beginning. It is possible that because she was exposed to technology growing up that this lead to her additional comfort level as well. As a language arts teacher, she was also very aware of the impact of technology on

students' communication practices. In one of her course blog entries she encapsulated her belief that students' literacy practices had been impacted by technology:

> I noticed that I was really focusing myself... on the idea of integrating multimedia technologies and social media technologies into the literacy classroom to stimulate creativity. How can these new worlds of reading and writing inform our instruction of the language arts? What benefits can language arts teachers reap from using Web 2.0 tools? Are there disadvantages to these new technologies in the way they impact literacy skills? Or is it just a new kind of literacy that students will develop? How can we help teachers to navigate a world they did not grow up in, well enough to instruct their students?

She also acknowledged the challenge of trying to determine the best way to address these skills:

> As a teacher of literacy there is no denying that what the concept of true literacy has changed over the last 10 years. Literacy has always been based on understanding and communicating; but today only part of understanding and communicating is based in text. A large part of the communication learning that happens today comes from multimedia interactions online.

She believed that utilizing multimedia enabled students to learn content better and enhanced her ability to deliver instruction. Given the vast resources on the internet, overall she felt that multimedia facilitated their ability to bring content alive and to allow students to experience learning in a different way.

She expressed her belief that utilizing multimedia in her instruction was essential for keeping students engaged and motivated. In her rationale for her course project which incorporated multimedia tools, she talked about how multimedia can support students' literacy learning:

> What I have found is that students benefit from multimedia because multimedia can be used to address different learning styles and it is within the schema of almost all students. It helps students who struggle with information and it helps high-level students explore their creativity...students feel the need to use multimedia now in order to feel that they're learning more, to be more engaged, and to feel less stressed out. That's why I feel it is necessary to have it as part of my teacher tools.

Cathy's belief that particular multimedia tools had practical value was key to her implementation. Because the course required her to research, experiment with, and share the usefulness and practicality of potential multimedia tools, it was key in her development of a rationale for multimedia implementation. Cathy said:

> I used all the tools I learned about in class to create extended learning environments for my students that allowed me to flip my classroom in small ways and allowed the students to collaborate with each other outside of the room. This also opened up the possibility of discussion and group work beyond the walls of my room….I will say that it takes personal time to learn all of these sites that I have used with my students. There can be challenges in implementing with students who might have technical difficulties or who do not sign up for the sites or accounts; however, the more you use technology in your classroom, the more you get used to building in time for instruction to reduce these kinds of issues. I start the year off with the technology workshop for students--this helps me to avoid issues later in the year.

Cathy pointed out that the professional development through the course taught her about the different multimedia technology resources online, a "toolkit" which she felt could benefit her and other teachers when she provided professional development to them in her district. In her first

blog assignment for the class, she discussed her desire to build her own online resource for teachers, a tool she felt would benefit teachers who needed more support and ideas for how to integrate technology into her teaching. She wrote:

> I had never previously heard of the Center for Implementing Technology in Education (CITEd) and am thoroughly impressed. I occasionally teach professional development courses in my district on integrating technology in the classroom. I have often thought about having a tool exactly like this, one in which I can gather resources and information for the people in my classes. What an easy way to gather specific resources geared towards a specific class topic, specific curricular area, or specific group of teachers!

Interestingly, five years after writing that blog and expressing that desire to provide professional development for teachers in her school, Cathy was hired by her district to be a technology coach in her district and to provide professional development for teachers on how to use technology to increase literacy skills.

Cathy said in a follow-up interview in July 2016 that she frequently used multimedia technology over the past two years (since taking the course) several times a week:

> taking the course really helped me to develop a portfolio of ideas. I was interested in using multimedia in the classroom and had started to do so, but there was very limited professional development in that area in my school district. From my multimedia design classmates and instructor, I was able to build a list of websites and apps that were useful in my teaching. As result I now use Edmodo, screencasts, Animoto, YouTube, and other sites on a regular basis.

She believed that the course made her feel more confident about using technology. She said “it is better to come from a place of knowledge rather than to wave around in the dark. It also inspired

her to complete a certificate in educational technology and to pursue her doctorate. Her research was focused on a multimedia and literacy related question: “I used all the tools I learned about in class to create extended learning environments for my students that allowed me to flip my classroom in small ways and allowed the students to collaborate with each other outside of the room. This also opened up the possibility of discussion and group work beyond the walls of my room.”

In 2017, Cathy described the changes that had resulted from the Common Core State Standards and PARCC testing in her district. She said her district implemented a one-to-one initiative in grades 7 to 12. As a result of her knowledge and experience implementing multimedia technology into her teaching, she was asked to take on a new position as an educational technology coach to help implement this new initiative instead of working as a classroom English teacher. Based on her experiences in the course and her own research, which revealed how the use of multimedia can have a positive impact on students’ literacy skills, Cathy described that she continued to teach other teachers how to implement technology into their instruction in order to continue to have a positive impact on students and teachers.

**Participant 3: “Brianna”**

Brianna took the "Web-Based Multimedia Design for Educators” course in the Spring of 2013. At that time, she was a middle school social studies teacher, teaching 6th, 7th and 8th grade. In a pre-course survey Brianna defined multimedia as “encompassing a wide variety of resources to present or examine material.” Brianna stated she took the "Web-Based Multimedia Design for Educators "class because she wanted to gain “a deeper understanding of the resources available online and how to utilize them within my classroom.” It was clear from the beginning of the course and from her discussions and blog posts throughout the course, however, that

though Brianna felt the learning potential from multimedia was immense, her district's lack of support, resources, and curriculum focus on technology was a major obstacle to her ability to implement multimedia technology in the way she would have liked.

She said in a pre-course survey, "my school district does not offer much in the way of in-house training, and I want to ensure that I am aware of and proficient in the newest technologies available to help with my profession." She expressed her belief that society was shifting technologically and that it was essential that students learn these skills. She asserted,

> the shift towards developing 21st century skills and usage of Common Core Curriculum literacy standards show that society is moving towards a multimedia age in which notions of literacy and content will expand. Student comprehension of modern technology and how to speak through it will be necessary in meeting these educational goals.

Her stated goal for the course in the pre-course survey was to utilize technology to create a better way to communicate with parents and students and to "create a wide variety of materials to use in my classroom and to build comprehension for technology and Social Studies for my students." She expressed in a pre-course survey that she believed it was "extremely important" that teachers have knowledge of where multimedia fits into the Common Core State Standards, but that she herself did not know where multimedia fit into the standards. She strongly believed that multimedia could be utilized to improve student learning and that it could improve her delivery of content and material.

In a follow-up interview and survey in 2016, she stated that she was aware of where multimedia was incorporated in the PARCC testing, but not necessarily in her own content standards. Her district still provided limited access to computers and there was no emphasis of utilizing multimedia technology in their curriculum to meet the Common Core State Standards.

She also said “technology implementation is not discussed at PD meetings though the use of multimedia tools would greatly enhance students’ abilities to meet these standards.” Though she recognized that the literacy skills tested on the PARCC exam, such as “primary source analysis and evaluating claims,” could be taught and learned in the Social Studies classroom, she explained that the Language Arts department in her school was primarily expected to teach these skills. Though the Common Core literacy Standards were created for Social Studies teachers as well as language arts teachers, her district did not recognize this, and as a result, this impacted her professional development in this area and well as in her curricular focus.

Brianna’s motivation to use multimedia technology had less to do with meeting the standards and preparing students for testing than it did with her own beliefs about how multimedia could help her students to learn. Despite the fact that there was little to no emphasis from her district on utilizing multimedia to meet the Common Core State Standards for testing preparation, or for learning purposes, it was her own beliefs that motivated her to learn and incorporate multimedia into her instruction. She expressed her belief that one of the strengths of teaching social studies with multimedia technology was her belief that it allowed for students to learn differently and that it expanded students’ knowledge. She said:

> Images and video are major part of social studies...students showed a deeper understanding of concepts once they had seen them or examples. Students could look at a textbook map of Egypt and see that there were deserts around the Nile, but if they were shown a satellite image of the color contrast in close proximity of the desert, they could develop a deeper understanding of the importance of the Nile to Egyptians’ lives. students….sorted through numerous images which gave them a broader exposure of the topic more than any textbook could.”

One of Brianna's projects for the "Web-Based Multimedia Design for Educators "course was to create a website that she could share with students and parents and which she could place useful resources, including multimedia resources for students. She felt that this was the most efficient way to extend her classroom and utilize technology given the limited computer availability in her school.

Compared to the three other participants in the study, Brianna had the most difficulty in terms of access in the school to equipment. In the beginning of the study, she did not feel she had much support at school and mostly relied on technology tools that students could access at home. This included utilizing the website she created in the "Web-Based Multimedia for Educators "class to provide resources that students could access remotely. In the follow-up interview in 2016, she said she continued to use her website that she created as her final project in the course after it ended. She attempted to use a better platform that allowed for more student involvement in the creation process, but her district lacked available computers for all of the students. She explained that on her website "students were given resources that were used in the classroom along with additional ones to extend their learning…[such as] Vodcasts of students' vocabulary words and study guides and reviews for tests. The website was updated routinely and students were on the website at least once a week."

Though Brianna was limited in how she could use multimedia tools in her instruction, her beliefs that it was important for student learning lead her to do as much as she was able to with the multimedia tools that were available to her at the time. She stated:

> I believe that multimedia provides a vast amount of resources that enable me to teach in ways that standard textbook/lecture teaching could not. Multimedia provides that ability to 'surround' my students in the history they are learning and make it come alive for

> them. Students are able to make more independent roles for their learning, whether they are deciding to view a video from class again or complete notes from a presentation if it went too quickly for them. They can choose to play games or create projects that are available through links on the website to learn about different aspects or role-play to get a better experience. They teach each other how to use the multimedia technology with some students (typically my less focused students) taking the role of assistant teacher and finding a new purpose in the classroom. I believe that learning requires independent, self-directed practice and multimedia allows for this in my classroom... In so many ways: students are exposed to images and videos, have conversations with each other, other classes and even students from other states, they have more control over their own learning, and the classroom expands in time and space (ex. blogging for help on homework after school or virtual tours of historic sites).

Brianna continued her interest in researching and utilizing multimedia tools in the years after she had taken the "Web-Based Multimedia for Educators "course. Briana stated in a post course interview in 2016: “As new web 2.0 tools are increasingly becoming available, for free, I also find myself moving to these rather than some I used in the past, still applying what I learned about evaluating web 2.0 tools to help me filter through the vast options out there.” Her ability and willingness to continue to analyze and utilize multimedia technology tools as they changed and evolved, though difficult, enabled her to continue her use of multimedia in her instruction. She believed it increased student engagement, and helped to make connections with students and parents. She stated:

> Searching through the vast array of multimedia tools available that will meet my instructional needs, and not just be technology for the sake of technology, can be

> daunting at times. I have found reputable sites that review new tools as they relate to SS instruction, which makes this task easier. I also cannot lie, I love seeing the excited looks on my students, parents, and co-teachers faces when they watch the first the Vodcast. Who wouldn't want to create their own video or multimedia poster rather than write a five paragraph essay? Students generally love using technology in the classroom. It connects their own experiences and knowledge base to new skills being taught in the classroom.

Her continued use of multimedia technology in her instruction over the years since taking the "Web-Based Multimedia for Educators " course lead her to be recognized as an instructional leader in her district. One of her biggest takeaways from her professional development experience in the course was her ability to learn new tools and to evaluate how they could be utilized for instructional purposes. She stated in 2017:

> One of the most important skills I learned from this course was to find answers to problems I faced using technology. Not only have I developed skills in multimedia technology integration, but I also guide other teachers in their integration as well.

Once her district developed a 1:1 computer initiative in 2017, Brianna was called upon to provide professional development for other teachers on how to incorporate technology into instruction. However, it was the change in the district's focus that finally enabled her to have access to more computers. Brianna did continue to utilize some of the tools she learned in the "Web-Based Multimedia  Design for Educators "course, such as Animoto, screencasts, and videos, but she also moved on to other tools such as Google Classroom. She said her continued ability to evaluate new tools helps her to "filter through the vast options" of available multimedia tools. She continued to prefer tools which had an easy setup and which were easy to learn and use.

The PARCC testing and the Common Core State Standards initiative were the driving impetus for her district's 1:1 computer initiative. Her district did implement practice tests for PARCC; however, the responsibility for any type of preparation was still left to the language arts teachers, showing little change in her district's approach to literacy for non-language arts teachers.

**Participant 4: "Shelly"**

Shelly took the "Web-Based Multimedia Design for Educators" course in the Summer of 2013. At the time, Shelly had been teaching high school physical science, biology and physics for 20 years. She had taken several years off to raise her children and had returned to teaching 4 years prior to taking the course. In a pre-course survey, she defined multimedia as "a varied approach to information that can be understood by people due to the many methods that it can be delivered, usually incorporating different modalities, such as visual, auditory, and tactile experiences." Her motivation to take the course was her interest in "wowing her students with the skills that you can gain from using technology, showing them that you are never too old to learn and giving them the confidence to try." She also expressed her belief that when "talking about 21st Century competencies, multimedia is the easiest and at this point the most effective way to reach audiences and to communicate with people. Teaching science, especially biology, there is so much material and concepts that are being learned every day, and that this is the most accessible way to reach students."

As in Brianna's district, there was less of a literacy focus for the non-language arts teachers, despite the fact that the Common Core State Standards initiative was designed to address literacy across the disciplines. Shelly stated her district's focus on standards was geared towards the Next Generation Science Standards (NGSS). However, she believed it was very

important that teachers understand where multimedia fit into the Common Core State Standards, and that she understood how multimedia fit into the Common Core State Standards. She also stated her district did not stress the use of multimedia on the PARCC exam in science classes.

Shelly's own beliefs in the usefulness for student learning was her driving force for utilizing multimedia technology in her instruction. Unlike Brianna's district, there was general support for technology infusion as well as access to computers, despite the fact that it was not specifically geared towards PARCC testing or any requirements driven by standards. Her school also had a technology support specialist who was on hand to help teachers and they also ran professional development workshops for teachers on professional development days. This support and access enabled Shelly to utilize multimedia technology in her instruction. She stated:

> Science leads to multimedia. Science is more believable when students can actually see it in action where in the past it would have had to try to visualize in their mind...with multimedia, students get more of how things relate to each other. Before students were not participants-- they were just observers; now they're becoming participants and authors; students can learn a lot more by doing than just by sitting there observing; the difference is now they can create an animation and create multimedia and not just watch multimedia in class...I think we need to be giving kids more experiences and if we can do that through multimedia more power to it; we observed, we recited, we gave it back through multiple choice tests that was basically about it, whereas now they can take it and do so much more than that right online--they can be contributing to an expert's research. We couldn't even dream of something like that. My job as a teacher is to be prepare students for the outside world.

Shelly believed that incorporating multimedia technology not only benefited students in their ability to learn the material but also to learn valuable skills needed once high school was over. She was also conscious of how different the multimedia tools were compared to the multimedia available when she was a student, which was not computerized, and which was not interactive.

Shelly utilized the course to create a website for her biology class which enabled students to access resources. In the follow-up interview in 2016, she stated she was still utilizing the website so that students could incorporate video projects and collaborative projects through multimedia technology as well as to complete webquests and to watch animations. She had also begun to use Google Classroom. She stated that the course helped her confidence with using technology and that "before I didn't feel comfortable enough to assign that because I didn't know how to do it, now I can say 'alright, I know this is possible.'"

In the follow-up interview in 2017, Shelly had left her public school and was teaching in a private school. She no longer utilized her website because she was no longer teaching that same subject; however, she felt what she had learned in the course still helped ] her. She said:

> I continued to pursue different ways to reach students through technology and looking to develop professional development through web-based technologies. I am currently developing a professional development program with online capability for the school along with traditional classes.

She also continued her use of Google Apps for education "along with different simulations and aid in visualization of concepts."

Because Shelly was working in a private school, there were no longer any requirements from the Common Core State Standards or to administer PARCC. She felt there was less emphasis on technology in that school and that as a result students were not learning 21st

Century skills to as great an extent. There was no "motivation to comply" to any of these initiatives, and therefore it was not a school priority or something that Shelly considered. However, her belief that that the use of multimedia could improve student learning continued, as did her desire to learn new technologies.

As a result of comparing the experiences and beliefs of the four participants in a cross-case analysis, there were common themes that emerged (Cresswell & Poth, 2017). These are discussed under each of the headings below.

**Beliefs about Multimedia and Literacy: Perceived Usefulness**

This study showed, as the research points out, that teacher beliefs do have an impact on teachers' decision to accept or reject the use of multimedia in their instructional decisions (Daly, Moolenaar & Liou, 2015; Ertmer, Ottenbreit-Leftwich, et. al, 2012; Kagan, 1992; Antonietti & Giorgetti, 2004; Ertmer, 2005; Hermans, Van Braak & Valcke, 2008; Lim & Chan, 2007; Ertmer, 2005; Cuban, 2001; Zhao, et al., 2002; Lim & Chai, 2008; Angers & Machtmes, 2005). Teacher beliefs about multimedia technology can provide important insights into why a teacher will accept or reject the use of multimedia technology in their classroom teaching. This study showed that teachers' beliefs about multimedia technology are also formed by real and perceived controls they have over decision making in their own classrooms, as well as by their self-efficacy to utilize multimedia technology in their instruction. In order to get a more complete picture of all of the determining factors that impact their implementation of multimedia technology, teacher beliefs should be considered in conjunction with other determinants that weigh into their instructional decisions.

This study showed that the participants shared general beliefs about multimedia technology, and based on their pre-course surveys, they had developed many of these general

beliefs before beginning the "Web-Based Multimedia Design for Educators" course. In their definitions of multimedia, they described it as an integration of different modalities such as sound, images The Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980) which informs the "Perceived Usefulness " aspect of the Technology Acceptance Model (TAM) (Davis, 1989; 2002), demonstrates that individuals' beliefs are an essential starting point prior to eventually accepting and utilizing a technology. The model demonstrates that when individuals believe that there is potential that the outcome of using a particular technology will be positive, they will consider the use of the technology. It is their beliefs, combined with other factors, however, that will eventually determine if they will eventually adopt the use of the multimedia technology. The teachers' motivation for taking the "Web-Based Multimedia Design for Educators" course was predicated on their general belief that using multimedia technology had the potential to help them to improve their instruction, as well as the learning outcomes and experiences of their students. They stated they took the course to learn more about how to do this effectively and successfully.

One of the reasons they stated they believed teaching and learning with multimedia was important was because of changed communication practices, which they believed were the result of technological innovation. They believed that it was important that they knew how to utilize multimedia technology in their instruction, as well as how to help students to develop their own literacy competencies with multimedia technology. As Thorton (1991) argued, it is teacher beliefs about learning, curriculum, and instruction that influence their teaching decisions.

The participants believed that students' comprehension of multimedia technology and developing skills to communicate with it were necessary for their students' education (Walsh, 2017). Though the development of literacy and communication skills was especially emphasized

by the two Language Arts teachers, Lisa and Cathy, they all believed that using multimedia enhanced students' literacy skills through assignments which incorporated multimedia technology along with reading, writing, and speaking skills. They believed that teaching with multimedia made their students' learning experiences more relevant, that it increased engagement and motivation of students, and that it enabled them to extend students' learning outside of their classrooms and to connect parents to their classroom. They believed that utilizing multimedia technology could improve their students' learning as well as the delivery of their instruction.

The participants also believed that multimedia technology facilitated students' learning because it could help students to visualize and experience the content in ways that teaching without it could not. Brianna, who taught Social Studies, and Shelly who taught science, especially emphasized that they believed the use of images, video, and simulations, which were enabled through multimedia technology, enhanced students' learning and comprehension in ways that textbook reading and traditional photographs and pictures could not. However, both Brianna and Shelly stated that their schools placed the major emphasis of the literacy requirements of the Common Core State Standards and of the PARCC testing mostly on the English teachers, rather than on teachers in other content areas such as Social Studies and Science. However, this study demonstrated that these general beliefs are not the sole reason that an educator will adopt or reject multimedia technology. There are other factors as well, and these will be discussed in the next section.

**Beliefs about Multimedia: Perceived Ease of Use**

There are both intrinsic and extrinsic factors that are included in the components of the other facet of the Technology Acceptance Model, "Perceived Ease of Use," which is informed by

the Theory of Planed Behavior (TPB) (Davis' 1989; 2002). In addition to the participants' beliefs, it was also their experiences with specific multimedia technology tools that ultimately determined their use and adoption of multimedia technology. This included their perception that the multimedia tool could be learned easily, that it could help accomplish their intended learning outcomes with students, and that it could be implemented easily in their classroom experiences in their respective schools. Based on their own conditions in their schools, their ability to accomplish this varied with each participant, primarily because their schools had varied access to technology tools and infrastructure and their leadership placed different values and emphasis on the use of technology in their schools. Through the course of this study, it could be seen that as their schools experiences and access to technology changed, they were able to make changes in their implementation of multimedia technology. Their belief that multimedia had the potential to be beneficial in their instruction remained constant, but their usage of specific tools and their access to multimedia technology changed over time because of extrinsic factors in their schools or their experiences with specific multimedia tools, which ultimately determined their ability to implement multimedia.

This study showed that a teacher may generally believe that using multimedia technology is good, but reject a particular technology tool because it is not compatible with some aspect of their instructional realities in their schools. This may include the limitations of the tools or their ability to access it; the perceived feasibility of implementation; the difficulty of learning the tool.

**Impact of Sustained, Focused Professional Development**

This study revealed that the sustained, focused professional development the participants received on multimedia technology through the "Web-Based Multimedia Design for Educators" course helped them to develop the skills to become self-learners of multimedia technology and to

advance students' learning through their own growth as educators (Avolos, 2011). The long-term impact of taking the course was seen in their sustained ability to learn and adapt to new multimedia technology tools and by their development as teacher leaders in their respective schools. By taking the course, they stated they were able to fill the gaps in their own knowledge and to build their self-efficacy to utilize multimedia technology in their instruction.

The knowledge and skills they developed through the course also enabled them to create a wide variety of materials which they felt they could use to improve students engagement, motivation, and learning as well as to continue to research and evaluate new potential tools as technology changed and evolved. The assignments in the course, which required them to research, evaluate, and to plan lessons for implementation enabled them to develop practical skills to identify potential multimedia tools to implement into their teaching. However, the accessibility to computers in their schools as well as some of the limitations or supports of their school districts continued to impact their ability to implement multimedia technology.

**Impact of State Mandates on Teachers**

This study demonstrated that the participants' school district's response to the CCSS and PARCC mandates had a bigger impact on the teachers' response to the mandates than the "Web-Based Multimedia Design for Educators" course did. The impact of the initiative on the teachers' experiences in their schools could be seen over time, but it impacted some of the teachers' access to technology, an change in emphasis on instruction and curriculum, and to the development of computer initiates and technology leadership positions due to this change in emphasis.

The teachers stated they focused less on using multimedia technology to meet standards than they did on utilizing multimedia technology in ways they felt enhanced their instruction or benefited student learning. They did believe, however, that they were meeting the standards and

improving students' literacy skills through their implementation of multimedia technology in their instruction.

However their districts' focus or lack of focus on the Common Core State Standards initiative could be seen, and it did have an impact on Cathy and Brianna' schools especially. Cathy and Brianna both reported in the beginning of the study that their ability to implement multimedia technology into their instruction was impeded by a lack of devices in their schools. However, after a few years, they both said that the CCSS initiative and online PARCC testing requirements in the state spurred their districts to create a 1:1 Chromebook initiative which improved their access to technology.

Both of them also stated that their professional development through the "Web-Based Multimedia Design for Educators" course helped them to develop the skills necessary to acquire technology leadership positions in their respective schools. Lisa and Shelly's districts, which already had more access to technology than Cathy's and Brianna's at the beginning of the study, did not see as much change as a result of the initiative. Lisa's district felt like they were already preparing students to meet the standards and for the PARCC testing and did not make any changes. Shelly said any focus on PARCC testing was put on English teachers in her school and that the science teachers only focused on the Next Generation Science Standards, which were completely separate from the CCSS. This inconsistency across their experiences is reflective of the literature surrounding the Common Core State Standards initiative.

**Summary of Findings and Conclusions**

My first research question was what beliefs do teachers have about multimedia and literacy? The teachers believed that multimedia enables a person to deliver or present information in multiple modalities/formats, which include audio and visual/video capability. To

them, the concept of multimedia is linked to the various digital tools that enables the integration of all of these modalities simultaneously. The teachers believed that it was necessary to teach students how to utilize these tools in order to develop 21st Century competencies for literacy. Cathy and Lisa, both language arts teachers, believed that using multimedia enabled students to improve their writing skills, and their reading comprehension, something that is supported by the research. All of the teachers believed that various multimedia tools enabled students to benefit from the visual aspects of multimedia, including video, images, and graphs, in order to help students visualize new concepts that they were learning in the various content areas.

They also believed that students benefited from the use of various multimedia tools that digitally enabled students to collaborate; which allowed them to virtually extend their classroom beyond the physical walls into a digital space; and which enabled students to learn from and to create content in various forms of multimedia. The teachers also believed that multimedia lead to increased engagement from students and that it benefited their overall learning of content.

My second research question concerned the impact of the teachers' professional development through an online graduate course called "Web-Based Multimedia Design for Educators." This included the way they think about multimedia and its purpose in classroom instruction; their own self-efficacy to utilize multimedia in their instruction; and their view of how multimedia can be interpreted and articulated in order to meet the Common Core State Standards.

Through their self-report in various interviews both during and after the course, the teachers expressed their belief that the course enabled them to improve their efficacy to use multimedia in their classroom instruction. Each of them reported their continued use of multimedia tools they learned in their class, as well as their ability to transition to and learn new

multimedia tools over time. They continued to believe that the use of multimedia in their instruction was useful for student learning, for student engagement, for the facilitation of content, and for the development of technological and literacy skills.

This belief continued to motivate them to use the tools or resources they had learned in the course, and/or to learn and adapt to new tools. Each of them reported that they had been asked to be teacher-leaders in their respective schools/districts as a result of this efficacy and ability to teach other teachers. One of the biggest impacts on their ability to utilize multimedia in their instruction was the support they had in their schools in terms of access to computers and ability to control what they were teaching with multimedia.

This research study demonstrated that some of the goals of professional development for teachers in multimedia technology should be to help teachers to develop a rationale/methodology for utilizing multimedia in their content area instruction as well as to determine how the multimedia can be utilized to support student learning. In addition, each teacher articulated how impactful it was that the course helped to develop a means to evaluate multimedia tools for their capability of facilitating instruction. This takeaway enabled the teachers to learn new tools on their own over time and to provide professional development to other teachers within their schools. This is important considering that much of the research on professional development shows that there is often little long-term impact on teachers. In addition, if professional development opportunities for teachers through graduate education courses can also produce teacher-leaders, the impact of the learning can be far more reaching over longer periods of time—two very desirable outcomes for professional development.

All of the teachers in the study were aware of the CCSS that included multimedia, but they did not make that the main reason they were implementing multimedia into their instruction.

It had more to do with their beliefs about how multimedia could facilitate their instruction and student engagement/learning. They did believe, however, that they were meeting the standards through multimedia implementation and that it met the content and literacy skills that were required in the CCSS. However, this shift was not seen immediately, and it impacted each of the teachers differently depending on the district they were in and how quickly their districts began their goals of upgrading their technological infrastructure.

It is not clear if the "Web-Based Multimedia Design for Educators" course had any specific impact on their understanding of the Common Core State Standards, especially since it was not a focus of the course. Though teachers mentioned the standards when citing related standards within their course projects, there was no explicit focus on the standards in the content of the course itself. It is possible that the teachers were learning about the standards in their respective schools; their schools' focus or lack of focus on the standards and the PARCC testing had an impact on their own individual understanding of the standards as well. One goal of any professional development course for educators could be to be more deliberate about making teachers aware of current state or federal initiatives that are impacting schools to raise their awareness and to help them to understand the related research and theory that can help improve instruction.

# CHAPTER 5

## CONCLUSIONS AND IMPLICATIONS FOR PRACTICE AND RESEARCH

On many levels, this study has been interesting and impactful for me because as a practitioner, I am faced with many of the same challenges as the teachers in my study on a daily basis. In addition, as one of the researchers who originally helped to design the "Web-Based Multimedia Design for Educators" course, I know the difficulties of trying to create worthwhile professional development experiences for teachers, while working within my own limitations as an educator.

As discussed in the literature review, the research around professional development for teachers suggests that effective teacher professional development has the potential to increase student achievement, improve classroom instruction, and to enhance teacher knowledge and skills (Borko, 2004; Darling-Hammond, et al., 2009). It also shows that sustained, focused professional development that is also grounded in theories of curriculum and instruction can have an impact on teachers' beliefs and instructional practice (DeMonte, 2013; Yoon, et al., 2007). This study demonstrated that a sustained, focused, professional development experience through a university-based course on multimedia technology did have a positive impact on teachers' self-efficacy to implement multimedia technology into their instruction and to sustain this self-efficacy over time.

This study demonstrated that the teachers believed that the utilization of multimedia in their instruction increased student motivation, student engagement, their ability to collaborate and communicate, and their overall learning. However, though they believed that student learning and engagement were improved as a result of their usage of multimedia technology, their evaluation was not based on student achievement data. Future research could include an

additional focus on how the professional development teachers receive on multimedia technology affects their instructional practice as well as specific student learning and achievement. It could also include an evaluation of specific multimedia technology tools that may or may not have an impact on student learning.

"The Web-Based Multimedia Design for Educators" course encouraged the teachers to take a critical and reflective approach to their implementation of multimedia technology in their instruction; helped them to develop the analytical skills necessary to continue to learn new technologies; and helped them to develop the ability to lead other teachers in their schools in this learning process as well. This is consistent with Easton's (2008) argument that it is important for teachers to become "learners" and to be "self-developing" in order to achieve real growth as educators (p. 756). Future research on the professional learning experiences teachers have through university based education courses on multimedia technology could look at the design of the course to ensure that these traits are fostered through the course requirements.

Studying the effectiveness of specific professional development university courses could also help to provide insight into how courses should be designed or modified based on the effectiveness of the course to impact teachers' ability to become continuous learners and teacher leaders as well as to impact student achievement. Though the "Web-Based Multimedia Design For Educators" course was delivered in an online format, this research did not determine if the online format had an impact on the teachers in a way that a face-to face format could not have.

As discussed in the literature review, the research shows there are benefits to offering online professional development to teachers, including university-based courses, such as technologically-enhanced learning environments and flexible accessibility (Lieberman & Miller,

2014), as well the ability to model the use of various technology tools in order to demonstrate their pedagogical usefulness to teachers (Ching & Hursh, 2014).

Though there is the potential to use online university based courses, such as the "Web-Based Multimedia Design for Educators" course to prepare teachers for utilizing technology in their own teaching environments (Ching & Hursh, 2014), there may be limits if the course is not contextualized in a specific school environment where the teachers work. Despite the potential for offering professional development to teachers online, there needs to be more research on how this may impact teacher practice (Dash, de Kramer, O'Dwyer, Masters, & Russell, 2012). Future research could include a focus on which type of delivery of instruction would be most impactful for teachers. The Technology Acceptance Model may be useful when determining a course design as well as to help evaluate the contexts of the various participants' school experiences and their beliefs about their real and perceived abilities to implement multimedia technology based on these experiences.

This research study demonstrated that studying teachers' beliefs can provide insight into teachers' rationale for utilizing or rejecting the use of multimedia technology in their instruction. The Technology Acceptance Model (Davis 1989; 1993) provided an analytic lens through which to identify intrinsic factors that impacted teachers' use or lack of use of multimedia technology. These included their beliefs about whether a particular multimedia technology was useful and easy to use; their feelings of self-efficacy to utilize multimedia for instructional purposes; and their attitudes towards using multimedia. The Technology Acceptance Model was also used to identify external factors that affected the participants' beliefs and usage of multimedia technology. In this study the external factors which impacted the participants included their schools' response to changes brought on by Common Core and the PARCC state testing

requirements; their access to multimedia resources; and the beliefs and actions of the leaders in their schools, whom influenced the teachers' real and perceived controls over their own curriculum decisions.

Many factors need to be considered when looking at what variables could impact teachers' approaches to multimedia technology in their classroom instruction; this is especially crucial when external pressures are a major impetus behind changes in teachers' instructional practices-- such as federal or state mandates, or changes in social practices brought on by shifts in technology. When teachers change or don't change their instructional practice with regard to multimedia technology, it is critical to try and understand which factors are potentially determining their instructional behaviors. Is it their beliefs? Their self-efficacy? Or is it something else, such as a real or perceived control or lack of control over their own ability to drive their curriculum and instructional decisions?

As stated in my research review, much of the research that builds a greater understanding of multimedia and of its connection to literacy and technology has been studied in separate but related disciplines. It would be useful to continue to determine theoretical approaches to study the impact that teachers can have on student learning through the usage of multimedia technology in their instruction. With this in mind, it may be helpful to utilize the Technology Acceptance Model in conjunction with other research frameworks to get a broader understanding of what teachers understand and believe about multimedia technology and how we can provide better training and professional development as to have greater impact on student learning outcomes in the classroom setting.

By starting with what teachers believe about multimedia technology and by gaining insight into many of the different factors that impact them in their individual teaching

environments, we can begin to unpack many of the various factors that coalesce in a teacher's instructional experiences with multimedia technology. Once we integrate all of the relevant research that overlaps within the study of multimedia technology, we will be able to gain more insight into how we can more effectively affect student learning, which is our ultimate goal. It is not enough to simply state that teachers *believe* multimedia can improve student learning; we have to know *how* it improves student learning and *how* it should be used instructionally to ensure that students are learning. We also need to ensure that teachers have the ability and instructional knowledge to carry this out effectively and to determine what the best methods of professional development are to ensure their sustained efficacy to be self-learners throughout their career.

On a final note, I would like to say that this study, though limited, did capture a glimpse of the impact that a professional development opportunity for teachers through an online graduate education course can have on teachers and their instructional practice. It also demonstrates where professional learning for teachers can intersect with classroom instruction, and how important their learning is. It is essential if we are going to impact students' learning that we continue to provide research on best practices for teaching with multimedia that can positively impact students. Understanding teacher beliefs is an important step, but it is not nearly enough.

In addition, this study demonstrated that state and federal mandates also have a direct and indirect impact on teachers and their instructional decisions and behaviors. It is important that the professional development that teachers receive in education courses maintain a relevance to the external pressures that teachers face. Courses such as the "Web-Based Multimedia Design for Educators" course need to be continually evaluated and redesigned on a regular basis in order to

stay relevant to teacher practice. If having long- lasting professional development in multimedia technology is a goal, determining how to help teachers to effectively evaluate tools as they continually evolve is important. It is not helpful in the long run to only teach certain tools that may be ineffective, could eventually change, or which become expensive or unavailable.

Though it was not necessarily the intended purpose, this study demonstrated that one of the outcomes from the Common Core State Standards initiative and the PARCC testing in New Jersey was the increased influx of computers into schools in order to accommodate the computer based testing. In the case of Lisa and Brianna, this not only lead to an increase in their access to computers, which was not the case when they were enrolled in the "Web-Based Multimedia Design for Educators" course, but it also lead to their taking on instructional leadership roles in their districts in technology implementation.

Though the Common Core State Standard initiative and PARCC testing arguably took on a life of its own in New Jersey and around the country because of political backlash and controversy, perhaps one positive consequence of the initiative was the increased availability of computers in schools. As can be seen with just the four teachers in my study, there was no consistency when it came to computer access in schools prior to this initiative. When the study began, Lisa and Shelly had more access in their schools than Brianna and Lisa did. However, because of the PARCC requirements, both Lisa and Brianna's districts began 1:1 laptop initiatives. When Phil Murphy ran for governor and said he wanted to discontinue the PARCC testing, I wondered what impact this would have on schools' commitment to keeping computers in schools if it were no longer required.

New Jersey's new Education Commissioner, Dr. Lamont Repollet, went on a state-wide tour in the spring of 2018, to meet with students, parents and educators in a focus-group setting

to get feedback on the PARCC testing. I was able to participate in one of these sessions when he and his team came to my school. It was an interesting and exciting experience to be able to listen to him and his concerns and hopes about the future of education in New Jersey and the role that the newly named New Jersey Student Learning Standards (NJSLS) would play in the increased focus on standards-based instruction. He also wanted to hear about any concerns we had about the PARCC testing and about suggestions we had for changes moving forward. To me, it was a positive first step to witness the Commissioner of Education solicit feedback from teachers, students, parents and administrators alike. My study taught me that teachers and their students have different experiences in their respective schools, and I believe it is important to try and capture these experiences before making major changes that impact so many children.

Based on the feedback that was received, a memo was sent out by the Department of Education on October 8, 2018, outlining some of the changes that were going to take place to the testing, which were approved by NJ lawmakers. Though the testing will not be eliminated as Governor Murphy wanted, as discussed, the test will now be re-named from the PARCC to the New Jersey Student Learning Assessments-ELA (NJSLA-ELA), reflecting its alignment to the renamed New Jersey Student Learning Standards (NJSLS).

At this time, there have been no other published documents outlining what will be actually tested. However, since the test is still aligned to the New Jersey Student Learning Standards, which include multimedia, and since the test is still computerized and is simply described as being shorter in length, it seems plausible that the new test will continue to include multimedia in the exam. Regardless, multimedia is still in the literacy standards which have to be met by New Jersey schools.

While the development of mandates, standards, curriculum and professional development may be aimed at improving instruction and at having a positive impact on students, how often do we know if that is the case? If mandates continue to come and go before they can take root in the minds and practices of educators, how will we ever know if they have changed what they were designed to do? If the results of any initiative are not continually measured in terms of the impact on student learning, how will we know if they were worthwhile in the first place?

Further research on multimedia technology would benefit from continued study of the myriad of factors that ultimately impact teachers and student learning, and not just the factors that impact teachers alone. More research is also needed on the impact of state and federal initiatives such as the CCSS and PARCC on both student learning as well as on teacher professional development. Data from the original PARCC initiative and any new testing which assesses students' understanding of multimedia may also provide insight into student understanding of multimedia. This can inform instruction as well as future teacher professional development.

Most importantly, it would be beneficial if the research and various terms and concepts related to multimedia technology, pedagogy, and teacher professional development could be unified; this would provide teachers and teacher educators with a clear focus on the best pedagogical approach to multimedia that would have the greatest impact on student achievement, ensuring students' overall college and career readiness in our increasingly technological society. While increased access to technology devices is crucial to teaching with or about multimedia technology, access is not a methodology or a pedagogical approach to learning. Teachers need a clear map on how multimedia technology can improve student learning and achievement. Only

proven research and effective professional development for teachers will be able to show literacy educators the way.

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## Appendix A
## Glossary of Terms

| Terms | Definition |
|---|---|
| Multimedia | |
| Professional Development | "professional development is about teachers learning, learning how to learn, and transforming their knowledge into practice for the benefit of their students' growth (Avolos' 2011 p. 10). |
| Teacher Beliefs | "a particularly provocative form of personal knowledge that is generally defined as pre or in-service teachers' implicit assumptions about students, learning, classrooms, and the subject matter to be taught" (Kagan, 1992, p. 65-66). |
| Self-efficacy | "one's belief in his or her ability to execute a particular task" (Holden & Rada, 2011, p. 3). For this study, "efficacy" refers to the participants' belief that they could effectively utilize multimedia tools within their classroom instruction. |
| Impact | Participants' beliefs about how the course helped them in their own learning and practice as well as their "behavioral intention to use" what they learned about multimedia technology in their teaching practice (Holden & Rada, 2011). |
| Perceived Usefulness | "The degree to which a person believes that using a particular technology system would enhance his or her job performance" (Davis, 1989) |
| Perceived Ease of Use | "The degree to which a person believes that using a particular system would be free of effort" (Davis, 1989) |
| Attitude Toward Using | "The degree of evaluative effect than an individual associates with using the target system in his or her job" (Davis, 1993, p. 477). |
| Beliefs about Behavior | Individual's estimated probability that performing the target behavior will result in a |

| | |
|---|---|
| | consequence (Ajen & Fishbein, 1980) |
| Evaluation of the Behavior | Value attached to a behavioral outcome or attribute; Positive or negative judgments about features of the behavior; Contributes to attitude along with behavioral beliefs (Ajen & Fishbein, 1980) |
| Opinions of Reverent Others | Important people associated with them who will approve or disapprove of this behavior (Ajen & Fishbein, 1980) |
| Motivation to Comply | Motivation to do what salient referents think an individual should do (Ajen & Fishbein, 1980) |
| Attitude About the Behavior | behavioral beliefs that either positive or negative feelings and experiences will result from a particular behavior (Ajen & Fishbein, 1980) |
| Subjective Norm | Person's perception that most people who are important to him think that he should or should not perform the behavior in question (Ajen & Fishbein, 1980) |
| Behavioral Intention | The strength of one's intention to perform a certain behavior (Ajen & Fishbein, 1980) |

# Appendix B
## Common Core Literacy Standards that Include Multimedia

| Domain | College and Career Readiness Anchor Standard | Grade 4-5 | Grade 6-8 | Grade 9-10 | Grade 11-12 |
|---|---|---|---|---|---|
| **Reading Literature (RL)** | 7<br><br>Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words. | RL.4.7. Make connections between the text of a story or drama and a **visual or oral presentatio**n of the text, identifying where each version reflects specific descriptions and directions in the text.<br><br>RL.5.7. Analyze how visual and **multimedia** elements contribute to the meaning, tone, or beauty of a text (e.g., graphic novel, **multimedia** presentation of fiction, folktale, myth, poem). | RL.6.7. Compare and contrast the experience of reading a story, drama, or poem to listening to or viewing an **audio, video, or live** version of the text, including contrasting what they "see" and "hear" when reading the text to what they perceive when they listen or watch<br><br>RL.7.7. Co mpare and contrast a written story, drama, or poem to its **audio, filmed,** staged, or **multimedia** version, analyzing the effects of techniques unique to each medium (e.g., lighting, **sound**, color, or camera focus and **angles in a film**).<br><br>RL.8.7. Analyze the extent to which a filmed or live production of a story or drama stays faithful to or departs from the text or script, evaluating the choices made by the director or actors | RL.9-10.7. Analyze the representation of a subject or a key scene in two different artistic mediums, including what is emphasized or absent in each treatment (e.g., Auden's "Musée des Beaux Arts" and Breughel's Landscape with the Fall of Icarus). | RL.11-12.7. Analyze multiple interpretations of a story, drama, or poem (e.g., recorded or live production of a play or recorded novel or poetry), evaluating how each version interprets the source text. (Include at least one play by Shakespeare and one play by an American dramatist.) |

| Domain | College and Career Readiness Anchor Standard | Grade 4-5 | Grade 6-8 | Grade 9-10 | Grade 11-12 |
|---|---|---|---|---|---|

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|---|---|---|---|---|---|
| **Reading Information (RI)** | 7<br><br>Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words. | RI.4.7. Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, **animations, or interactive elements on Web pages**) and explain how the information contributes to an understanding of the text in which it appears.<br><br>RI.5.7. Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently | RI.6.7. Integrate information presented in **different media** or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.<br><br>RI.7.7. Compare and contrast a text to an **audio**, **video**, or **multimedia** version of the text, analyzing each medium's portrayal of the subject (e.g., how the delivery of a speech affects the impact of the words).<br><br>RI.8.7. Evaluate the advantages and disadvantages of using different mediums (e.g., print or digital text, **video**, **multimedia**) to present a particular topic or idea. | RI.9-10.7. Analyze various accounts of a subject told in different mediums (e.g., a person's life story in both print and **multimedia),** determining which details are emphasized in each account. | RI.11-12.7. Integrate and evaluate multiple sources of information presented in **different media** or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem |

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|---|---|---|---|---|---|
| **Writing (W)** | 2<br><br>Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. | W.4.2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly. Introduce a topic clearly and group related information in paragraphs and sections; include formatting (e.g., headings), illustrations, and **multimedia** when useful to aiding comprehension.<br><br>W.5.2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly. Introduce a topic clearly, provide a general observation and focus, and group related information logically; include formatting (e.g., headings), illustrations, and **multimedia** when useful to aiding comprehension. | W.6.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content. Introduce a topic; organize ideas, concepts, and information, using strategies such as definition, classification, comparison/contrast, and cause/effect; include formatting (e.g., headings), graphics (e.g., charts, tables), and **multimedia** when useful to aiding comprehension.<br><br>W 7.2 Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information, using strategies such as definition, classification, comparison/contrast, and cause/effect; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.<br><br>W.8.2.Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories; include formatting (e.g., headings), graphics (e.g., charts, tables), and | W.9-10.2. Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content. Introduce a topic; organize complex ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and **multimedia** when useful to aiding comprehension. | W.11-12.2. Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content. Introduce a topic; organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and **multimedia** when useful to aiding comprehension. |

| Domain | College and Career Readiness Anchor Standards | Grades 3-5 | Grades 6-8 | Grades 9-10 | Grades 11-12 |
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| | | | multimedia when | | |
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| Domain | College and Career Readiness Anchor Standard | Grades 6-8 | Grades 9-10 | Grades 11-12 | |
|---|---|---|---|---|---|
| **Speaking & Listening (SL)** | 2, 5<br><br>including visually, quantitatively, and orally.<br><br>5) Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations. | SL 3.2 Determine the main ideas and information presented in **diverse media and formats, including visually, quantitatively, and orally**<br><br>SL.4.2. Paraphrase portions of a text read aloud or information presented in **diverse media** and formats, including **visually, quantitatively, and orally**.<br><br>SL.5.5. Include **multimedia** components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes. | SL.6.2. Interpret information presented in quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.<br><br>SL.6.5.. Include **multimedia** components (e.g., graphics, images, music, sound) and visual displays in presentations to clarify information.<br><br>SL.7.2. Analyze the main ideas and supporting details presented in **diverse media** and formats (e.g., visually, quantitatively, orally) and explain how the ideas clarify a topic, text, or issue under study.<br><br>SL.7.5 Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.<br><br>SL.8.2. Analyze the purpose of information presented in **diverse media** and formats (e.g., visually, quantitatively, orally) and evaluate the motives (e.g., social, commercial, political) behind its presentation.<br><br>8.5 Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest. | SL.9-10.2. Integrate presented in **diverse media or formats (e.g., visually, quantitatively, orally**) evaluating the credibility and accuracy of each source.<br><br>SL.9-10.5. Make strategic use of **digital media (e.g., textual, graphical, audio, visual, and interactive elements)** in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. | SL.11-12.2. Integrate urces of presented in **diverse formats and media (e.g., visually, quantitatively, orally**) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data.<br><br>SL.11-12.5. Make strategic use of **digital media (e.g., textual, graphical, audio, visual, and interactive elements**) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. |

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| **Reading in History (RH) and Science and Technical Areas (RST)** | 7, 9<br><br>7) Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.<br><br>9) Draw evidence from literary or informational texts to support analysis, reflection, and research. | RH.6-8.7. Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.<br><br>RST.6-8.9.Compare and contrast the information gained from experiments, simulations, video, or **multimedia** sources with that gained from reading a text on the same topic | RH.9-10.7. Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text. | RH.11-12.7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, as well as in words) in order to address a question or solve a problem.<br><br>RST.11-12.7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, **multimedia)** in order to address a question or solve a problem<br><br>RST 11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. |
| **Writing (History/Science / Technical) (WHST)** | 2<br>Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. | WHST.6-8.2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories as appropriate to achieving purpose; include formatting (e.g., headings), graphics (e.g., charts, tables), and **multimedia** when useful to aiding comprehension. | WHST.9-10.2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes: Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and **multimedia** when useful to aiding comprehension. | WHST.11-12.2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and **multimedia** when useful to aiding comprehension. |

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# Appendix C
# Surveys and Interview Questions

## Pre-Course survey

Q1 What is your name?

Q2 How many years have you been teaching and what subject and grade level do you teach? (If you are not teaching, what are your educational interests and/or what is your career path?)

Q3 Why did you enroll in this course? (What most interests you regarding the use of multimedia in education, and what would you like to learn from this course? )

Q4 How do you define "multimedia"?

Q5 Please describe any educational/training experiences that you have had in relation to the use and/or design of multimedia prior to taking this course.

Q6 What comes to mind when you think of the word "design" in relation to multimedia?

Q7 How do you intend/hope to use multimedia in the future?

## Beginning of the Semester Interview

1. Why did you enroll in the course “Web-Based Multimedia Design for Educators”?
2. What do you hope to get from this course?
3. How do you define multimedia? What would it include/incorporate?
4. What beliefs do you have (if any) for why learning about multimedia and its potential use in classroom teaching is important?
5. What is your knowledge of how multimedia fits into the common core state standards for your subject area/grade level of teaching?
6. What beliefs do you have for how students can benefit from lessons that ask them to incorporate multimedia?
7. What beliefs do you have for how students can benefit from learning from your (teacher-created) multimedia resources?
8. What experiences have you had with multimedia and/or visual design? Do you think it is important for you to have an understanding of visual design in order to create multimedia?
9. Is it important for students to have an understanding of visual design when they are creating multimedia or trying to understand visual messages?
10. Please describe any experiences that you have had in relation to the use of multimedia in your teaching.

11. If you have teaching experience and have used multimedia with your students, please describe one or more successes that you have experienced when using multimedia for instructional purposes.
12. If you have teaching experience and have used multimedia with your students, please describe one or more challenges that you have experienced when using multimedia for instruction.
13. If you do not have teaching experience, please describe how you would like to use multimedia in your classroom.
14. What do you perceive are your personal strengths when it comes to using multimedia?
15. What do you perceive are your weaknesses when it comes to using multimedia?

**Mid-Semester Interview**

1. What did you learn about graphic/visual design in "mini art school?
2. How does what you learned about impact how you think about multimedia in general?
1. How does what you learned impact how you think about Multimedia Design?
2. How does what you learned impact how you think about Instructional Design?
3. How would you plan your lessons differently based on what you learned?
4. What would you share with your students? Why?
5. How would you relate what you have learned to the readings in this course?
6. What is the concept you learned in "mini art school" that is most applicable to meeting the CCCS standards that include multimedia?
7. How might having knowledge of basic visual design help you teach students and meet the CCCS which include multimedia?

**Course Completion Interview**

1. How would you define multimedia?
2. How do you plan to apply what you have learned to meet the CCCS in your content area/grade level?
3. What concepts from what you have read in this course would you share with students? Why?
4. What projects would you do with students? Why?
5. What aspects of design would you share with students? Why?
6. How do you think design of multimedia can help students learn? Why?
7. How important is it for teachers to know about multimedia? Basic components of graphic design? Why?
8. How have you changed how you teach based on what you have learned?

**Survey Questions 2016**

**About how frequently do you use multimedia in your instruction?**

- **Very Frequently • Frequently • Occasionally • Rarely**

**Multimedia gives me greater control over how my students learn**

- **Strongly agree• Agree •Somewhat agree •Disagree**

**Using Multimedia tools is easy for my students**

- **Strongly agree• Agree •Somewhat agree •Disagree**

**Learning multimedia tools is easy for me**

- **Strongly agree• Agree •Somewhat agree •Disagree**

**It is easy for me to find multimedia tools that are useful in my content area to use**

- **Strongly agree• Agree •Somewhat agree •Disagree**

**I have a favorable attitude toward multimedia as a learning tool**

- **Strongly agree• Agree •Somewhat agree •Disagree**

**I intend to use multimedia in my instruction this year**

**1 – Never • 2 – Rarely • 3 – Occasionally • 4 – A moderate amount • 5 – A great deal**

**My students want me to utilize multimedia in my instruction and react positively**

- **Strongly agree• Agree •Somewhat agree •Disagree**

**My principal or supervisor will welcome my use of multimedia in my teaching**

- **Strongly agree• Agree •Somewhat agree •Disagree**

**My supervisors expect me to utilize multimedia in my instruction**

- **Strongly agree• Agree •Somewhat agree •Disagree**

**My colleagues encourage my use of multimedia**

- **Strongly agree• Agree •Somewhat agree •Disagree**

**I feel I have the ability to use multimedia in my teaching effectively**

**1 – Very untrue of what I believe • 2 – Untrue of what I believe • 3 – Somewhat untrue of what I believe • 4 – Neutral • 5 – Somewhat true of what I believe • 6 – True of what I believe • 7 – Very true of what I believe**

**I have the support I need at my school to use multimedia**
**1 – Very untrue of what I believe • 2 – Untrue of what I believe • 3 – Somewhat untrue of what I believe • 4 – Neutral • 5 – Somewhat true of what I believe • 6 – True of what I believe • 7 – Very true of what I believe**

**I have the resources I need at school to utilize multimedia**

**1 – Very untrue of what I believe • 2 – Untrue of what I believe • 3 – Somewhat untrue of what I believe • 4 – Neutral • 5 – Somewhat true of what I believe • 6 – True of what I believe • 7 – Very true of what I believe**

**I think my school has the necessary resources to implement the use of multimedia in my instruction.**

- **Strongly agree• Agree •Somewhat agree •Disagree**

**Using multimedia can help me best utilize instruction time and teach my content to students**

**1 – Very untrue of what I believe • 2 – Untrue of what I believe • 3 – Somewhat untrue of what I believe • 4 – Neutral • 5 – Somewhat true of what I believe • 6 – True of what I believe • 7 – Very true of what I believe**

**Using multimedia is compatible with my teaching philosophy**

**1 – Very untrue of what I believe • 2 – Untrue of what I believe • 3 – Somewhat untrue of what I believe • 4 – Neutral • 5 – Somewhat true of what I believe • 6 – True of what I believe • 7 – Very true of what I believe**

**My interaction with multimedia tools is clear and understandable**
**1 – Very untrue of what I believe • 2 – Untrue of what I believe • 3 – Somewhat untrue of what I believe • 4 – Neutral • 5 – Somewhat true of what I believe • 6 – True of what I believe • 7 – Very true of what I believe**

**I find multimedia tools easy to use.**
**1 – Very untrue of what I believe • 2 – Untrue of what I believe • 3 – Somewhat untrue of what I believe • 4 – Neutral • 5 – Somewhat true of what I believe • 6 – True of what I believe • 7 – Very true of what I believe**

**Teaching with multimedia makes learning more interesting**

**1 – Very untrue of what I believe • 2 – Untrue of what I believe • 3 – Somewhat untrue of what I believe • 4 – Neutral • 5 – Somewhat true of what I believe • 6 – True of what I believe • 7 – Very true of what I believe**

**Working with multimedia is fun for me**
**1 – Very untrue of what I believe • 2 – Untrue of what I believe • 3 – Somewhat untrue of what I believe • 4 – Neutral • 5 – Somewhat true of what I believe • 6 – True of what I believe • 7 – Very true of what I believe**

**Working with multimedia is fun for my students**

**1 – Very untrue of what I believe • 2 – Untrue of what I believe • 3 – Somewhat untrue of what I believe • 4 – Neutral • 5 – Somewhat true of what I believe • 6 – True of what I believe • 7 – Very true of what I believe**

**My intention is to use multimedia in my instruction this year**

**Never • – Almost never • – Occasionally/Sometimes • — Frequently**

**Follow Up Interview Questions 2017**
**(asked up to 5 years from taking the course)**

**1. Do you believe the Web Based Multimedia Course for Educators had an impact on your instruction? How?**

**2. Do you feel your ability to utilize technology was enhanced by taking this course? Do you feel more confident with technology as a result?**

**3. How would you define multimedia? Has your definition evolved since you took the course?**

**4. What multimedia tools or related tools did you learn about in the Web based Multimedia Design for Educators Course that you have implemented in your instruction at school? How did you do this? How would you describe its effectiveness?**

**5. What professional development have you received since taking the course on technology tools/multimedia tools? Do you seek out additional professional development on technology related or multimedia related topics since taking this course?**

**6. Is multimedia reflected in PARCC testing in your content area? How? Do you feel you need to address this in your instruction? How? Why? Do you familiarize your students with how PARCC incorporates video multimedia in testing?**

**About how frequently do you use multimedia in your instruction?**

**7. Do you feel you have the necessary tools and support at your school to incorporate multimedia in your instruction?**

**8. What is your understanding of how multimedia relates to literacy?**

**10. What is your understanding of how multimedia relates to the Common Core State Standards?**

**11. What lessons have you completed with students that involved multimedia?**

## Appendix D
## Code Book – Selected Excerpts

| Sample Code | Description | Sample |
|---|---|---|
| CCSS or PARCC | the teacher is conscious of new CCSS that incudes multimedia and recognizes new and changed literacy requirements and practices | Students will demonstrate understanding of the NJCCCS and CCCS standards (listed at end) within their multimedia creations and interactions. These will serve as a way for students to apply, analyze, synthesize, and evaluate the information obtained through Animoto slideshows, blogs responses, and social media profile creations |
| Multimedia Design | multimedia and the elements of design | |
| 21st Century Skills | the teachers are conscious that they are preparing students for a changed world that includes technological literacy | Areas that will be addressed with the 21st Century Skills include solving multidisciplinary problems within the blog. Open ended blog discussions that require a variety of knowledge across curriculums to answer and do not necessarily have a right answer just a need for proper justification of said answer will be developed. Students will be required to think unconventionally within the blogs, and on the projects. |
| Impact of Professional Development | Where there is evidence from the course readings, discussions, assignments, and theory that it is impacting | As new web 2.0 tools are increasingly becoming available, for free, I also find myself moving to these |

| | | |
|---|---|---|
| | the teachers perceptions,<br>ways of thinking,<br>or design of a lesson or belief | rather than some I used in the past,<br>still applying what I learned about evaluating web 2.0 tolls to help me filter through the vast options out there. |
| Efficacy for use of multimedia | where there is evidence that what was learned in this course has a direct impact on their belief or ability to utilize multimedia better as a result of this course | I am one of those teachers who is considered the immigrant,<br>an acquaintance of technology but not yet a friend.<br>It seems that every time I turn around there is another acronym, another app,<br>another district mandated website to use in the classroom. I am expected (and really trying) to be a 'native' but haven't passed the immigration test yet.<br>Wanting to be a part of this new country (more like a universe) but<br>need some "DSL - Digital as a Second Language" classes to help me<br>understand the language. Is there an app for that? |
| Literacy definition | how teachers see literacy as a learned skill through multimedia | Literacy is no longer bound merely between two covers, it is visual,<br>auditory…multimodal. |
| multimedia purpose in the classroom | how the teacher perceives multimedia to be useful or impactful in their teaching | Realizing that education is no longer about 'gaining information'<br>but teaching how to use information. Recognizing the need to teach kids how to function in the realm of global connections, |

| | | |
|---|---|---|
| | | collaboration and creativity of the 21st century.<br>Watching students open up doors that once was so limiting in those old 20th century<br>classrooms.<br>It's a whole new world of 'ah-ha' moments, not mention the possibility of sharing this with new friends worlds away. Yes, it's true, it's a small world after all--and there's an app for that? |
| Perceived Control Beliefs | The "perceived behavioral control" has more psychological ramifications,<br>and "refers to people's perception of the ease or difficulty<br>of performing the behavior of interest" | For the Multimedia project I am proposing a two part overhaul of technology utilization in<br>Social Studies. The first goal is to integrate technology into class instruction on a more frequent<br>basis to build student's familiarity with technological tools and an awareness of tools available<br>on the Internet. The second element is to strengthen teacher/student communication<br>through technology with the development of a website that will be used inside and outside the<br>classroom. The purpose for the website is to encourage the use of technology to strengthen<br>out of class project presentations and to utilize technology as a will do it rather than have to.<br>Also, the intention focuses on effecting students to employ |

| | | |
|---|---|---|
| | | technology independent of classroom instruction. |
| Perceived Ease of Use (Theory of Planned Behavior) | "ease or difficulty of performing a behavior" | The class website is at Weebly.com because there are no limitations on file sizes and storage space that it can hold. |
| Actual Control Beliefs | The "actual" behavioral control implies that a person has real access to resources that they need to carry out their intended behavior. | Within this group of students I have a wide gap of learning levels from 3rd to 7th grade abilities all within two twenty-three student classes. Also not all students have access to computers/internet at home. All receive access to computers within my classroom and accommodations can be made to allow these students time to work on projects. |
| Perceived Usefulness (Theory of reasoned Action) | The degree to which a person believes that using a particular technology system would enhance his or her job performance (Davis, 1989) | Nope, I don't use that site anymore, only because I have moved on to more advanced similar tools. |