

2012

An Examination of Teachers' Integration of Web 2.0 Technologies in Secondary Classrooms: A Phenomenological Research Study

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An Examination of Teachers' Integration of Web 2.0 Technologies in
Secondary Classrooms: A Phenomenological Research Study

by

Barbara A. Bokszy

A dissertation submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy
in
Computing Technology and Education

Graduate School of Computer and Information Sciences
Nova Southeastern University
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**An Abstract of a Dissertation Submitted to Nova Southeastern University in
Partial Fulfillment of the Requirements for the Degree in Doctor of Philosophy**

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Secondary Classrooms: A Phenomenological Research Study**

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Barbara A. Bokszy

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This study examined the process teachers used to change their pedagogy to deliver effective instruction using Web 2.0 tools. A phenomenological approach examined the “lived experiences” of seven secondary teachers through in-depth interviews giving this study an in-depth qualitative analysis of teachers and technology.

The widening digital divide between teachers and students causes a barrier for educators trying to reach their students. Students are raised with pervasive technology, while teachers are using Web 2.0 tools on a personal basis, but may not yet be successful in adapting their pedagogy to effectively use the tools for instruction. The ease of use and user friendly interface of Web 2.0 tools makes them a possible catalyst to help teachers change their pedagogy.

Past teacher professional development focused on providing teachers with the technical knowledge to bridge the gap, but has fallen short of causing the paradigm shift needed to change pedagogy to use current tools effectively. The Technological Pedagogical and Content Knowledge (TPACK) framework has been used in professional development and proven to lead to an effective change in teachers' pedagogy. Most current research has examined both the TPACK framework and Web 2.0 tools, but few researchers have looked at the teacher perspective on the issue.

The findings of this study indicated the types of Web 2.0 tools and how they are being utilized, the reasons why teachers are using the tools for instruction, and the technological factors influencing their use. Lastly, the impact their TPACK had on their success in adapting pedagogy points to the need for support either through professional development or support from colleagues. The “lived experiences” of the teachers provided implications for professional development assisting in making the change process easier for teachers, administrators, and students. This study provided an in-depth look at the relationship between in-service teachers, their TPACK, and how it relates to educational technology. In addition, this study demonstrated the rigorosity of phenomenology as a primary research method for educational technology.

Acknowledgements

The journey to complete this dissertation has been a long, yet rewarding one. Many of my fellow students during classes as well as at the idea paper stage were the inspiration that lit the spark of knowledge within me and got me started on research. One in particular, Shaz, kept throwing me the rope that kept me from feeling “adrift”. Many thanks to her for hanging in there with me through most of this journey.

Likewise, my family persevered with me through the long years and my feelings of love and gratitude are overflowing for them. From my mom, my sister and brother to my kids, they have all done without my time as I worked through this process. To my husband, Adam, for giving up so many things, and for being the independent person he is thus allowing me to pursue this dream without guilt, I express my gratitude. Also, thank you to Karen Schulz who was with me when I first started this journey and who followed me across the country and back again.

Many thanks to the awesome teachers that participated in this study. I have learned a great deal from them, and admire them as colleagues and experts in their fields. Hopefully, I’ll be able to work closely with each of them in the coming years.

Mostly, thank you to my advisors and committee for supporting my ideas. Particularly, Dr. Wang who gave me that second chance to prove myself, and to whom I will be forever grateful. Thank you to Dr. Snyder for joining the committee and adding her expertise to the process, and to Dr. Piazza for believing in my abilities in the beginning, and hanging in there through the end.

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Chapter 1

Introduction

Background/Introduction

The “digital divide” has shifted from describing the gap between students and their technology use, to students and their teachers (Johnson, Levine, Smith & Smythe, 2009). Students are considered “digital natives” (Prensky, 2001), or “neo-millennials” (Smith, 2009) who have been inundated with technological tools, while their teachers are considered to be “digital immigrants” (Prensky, 2001) who consider technology a second language. Adapting curriculum and pedagogy to incorporate the tools utilized by students on a regular basis has been a challenge for teachers (Harris, Mishra, & Koehler, 2010; Kumar & Vigil, 2011; Speak Up 2010, 2011; Wang, Ertmer, & Newby, 2004).

The “digital divide” was previously referred to by Jukes (2007), Prensky (2001), and Spivy, Young, and Cottle (2008) as the gap between socio-economic or racial groups and the amount of technology owned or utilized by them (Livingstone & Helsper, 2007; Morris, 2011). The new digital divide term has now been applied to identify the gap between secondary school students and their teachers (Johnson, Levine, & Smythe, 2009). Students, previously referred to as digital natives, are being taught by teachers who were identified as digital immigrants (Prensky, 2001). These “neo-millennials” (Smith, 2009), current secondary school students, are individuals born at a time of pervasive electronics. Raised in the late 1990s’s to the late 2010’s, they are significantly familiar with learning via technology rich environments at earlier ages than previous

generations. These students are “instant minded” (Smith, 2009) and have developed skills of multi-tasking and information seeking learning patterns. Yet their teachers have been identified as individuals (Prensky, 2001) to whom this digital language is a second language, and therefore are immigrants. Even though they are trying to adapt to this digital world, they lack the confidence knowledge base and expertise to use the new technology tools to change teaching approaches to meet the needs of their digital native students.

Web 2.0 tools, such as blogs, wikis, social networking and bookmarking tools, with their ease of use and user friendly interface, may be just the tools that will enable teachers to adapt pedagogy and migrate into the 21st Century (Spivy et al., 2008). However, extensive existing research has focused on how teachers learn the technology, but not on how and why they adapt their pedagogy for its effective use in classrooms (Brown & Crawford, 2005; Levin & Wadmany, 2008; Linckels, Kreis, Reuter, Dording, Weber, & Meinel, 2009; Scrimshaw, 2004; Unal & Unal, 2010). Some researchers have explored adult learning theory in relation to teacher professional development (Charles, 2009; Levin & Wadmany, 2008; Unal & Unal, 2010; Whitehouse, Reynolds, & Caperton, 2009). These studies have indicated that teacher professional development causing change in pedagogy is a long process developing over several years. This research was confirmed by the Speak Up 2010 National Findings (2011), which stated that only 25 percent of teachers are using the technology as tools for students. Many administrators have also documented that during 63 percent of classroom walkthroughs, no technology is being used at all (Pitler, 2011).

Since we are not bridging the digital divide as quickly as it is widening, it is paramount that researchers develop more effective methodology for measuring and affecting change in professional development that will lead to change in pedagogy. Koehler, Mishra and Yahya (2006) have attempted a beginning to measure and affect change in pedagogy by developing the Technological, Pedagogical and Content Knowledge (TPACK) framework (Figure 1.1). That framework has been used by researchers (Archambeault, Wetzer, Foulger & Williams, 2010; Bull & Ferster, 2008; Harris & Hofer, 2011; Ward, Lampner, & Savery, 2009; Williams, Foulger, & Wetzell, 2010) as a guideline for exploring teacher professional learning. The framework focuses researchers on the connection between teachers' technological knowledge, knowledge of teaching and how learning occurs, and the needs for their individual content areas. The use of the TPACK framework to guide professional development for teachers may lead the educational reform that will enable teachers to adapt their pedagogy to include the tools needed by today's learners. The framework gives a scaffold for developing professional development that meets the technological, pedagogical, and content needs of teachers thus enabling teachers to then adapt their pedagogy to meet their students' needs.

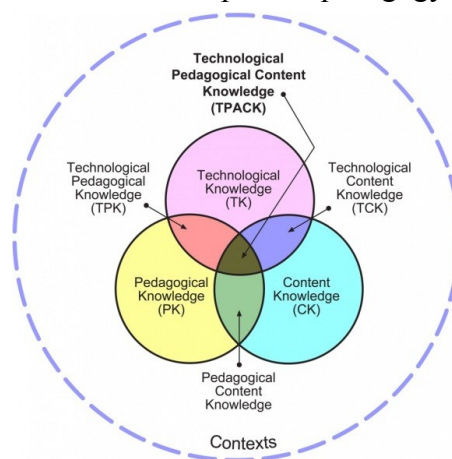


Figure 1. TPACK Framework
Illustration from <http://tpack.org>

Problem Statement

The widening digital divide between teachers and students causes a barrier for educators trying to reach their students. The problem to be investigated is how and why teachers struggle to adapt their pedagogy for effective use of Web 2.0 tools in the classroom. Nikolov (2007) identified this situation as a “phenomenon” blaming the lack of teacher professional development as one of the main causes for the problem. Most previous research (Brown & Crawford, 2005; Levin & Wadmany, 2008; Linckels, Kreis, Reuter, Dording, Weber, & Meinel, 2009; Scrimshaw, 2004; Unal & Unal, 2010) has focused on giving the teachers technological skills, but fell short of teaching them how and why to adapt their pedagogy to their content knowledge in order to make the best use of the tools (Harris, Mishra, & Koehler, 2010).

Other researchers have explored the factors that inhibit or help teacher development in utilizing technology. Wang, Ertmer, and Newby (2010) found that teachers’ self- efficacy beliefs for technology integration were impacted by their vicarious experiences and goal setting. Inan and Lowther (2010) found several factors that impacted teachers’ integration of technology into their teaching. These factors include the availability of the technology as well as technical support, but the factors that had the highest total effect included teachers’ beliefs about technology, their proficiency with it, and readiness to use it thus agreeing with Wang, Ertmer, and Newby (2010). Jukes (2007) called for re-examining our instructional delivery to enable virtual learning to transform teaching and learning. Harris, Mishra, and Koehler (2010) listed five

approaches to professional development that have dominated the educational arena which focused more on learning the technology rather than utilizing the technology to meet the students' learning needs of collaboration and real world skills enabling students to survive in the 21st century.

King (2002) suggested that faculty development in educational technology can provide a rich framework for learning about adult learning theory, particularly theories of transformational learning. Transformational learning theory describes learning as a process of self-reflection and examination leading to reorganization in perspectives. Understanding the changes educators experience in learning technology could lead to changes in the practice of teaching. Several other researchers have explored adult learning theory in relation to teacher professional development (Charles, 2009; Levin & Wadmany, 2008; Unal & Unal, 2010; Whitehouse, Reynolds, & Caperton, 2009). However, these studies have pointed out that teacher professional development causing change in pedagogy is a long process developing over several years. Since the digital divide is widening at a rapid pace, it is paramount that researchers find what makes professional development leading to changes in pedagogy more effective and efficient.

The development of the Technological Pedagogical Content Knowledge (TPACK) framework by Koehler, Mishra, and Yahya (2006) to understand the connection between teachers' thought process, their actions in changing pedagogy, and the results of this change in learning, is a step in the right direction. The purpose of the TPACK framework is to give researchers techniques for discovering and describing how knowledge is transmitted or developed, and how knowledge changes through that transmission.

The research into the use of Web 2.0 tools for learning (Brown, 2010; Bull, Hammond & Ferster, 2008; O'Connor, 2010; Ward et al., 2009) is offering hope that the tools may be a possible solution for teachers to be able to adapt pedagogy and bridge the digital divide. Previous technology was more difficult to learn and adapt. The ease of use of Web 2.0 applications such as Flickr, You Tube, Facebook, blogs, wikis, Google docs, and folksonomies has enabled increased use by teachers on a personal basis (Kumar & Vigil, 2011; Speak Up 2010 National Findings, 2011). While their personal use is beginning to parallel students' use of social networking tools, teachers have not yet found the way to adapt them for classroom use (Pitler, 2011; Speak Up 2010 National Findings, 2011). However, since teachers are closing the digital divide on a personal basis, they are already conquering the technological skills on their own, and the transition to using them in the classrooms should be easier for them with these tools.

Therefore, examining how and why teachers take the next step of changing their pedagogy successfully to utilize digital tools, particularly Web 2.0 tools in secondary classrooms, is necessary to bridge this new digital divide. Understanding their struggles and successes will aid in creating professional development to meet the needs of the teachers during this transition, leading to more effective and efficient changes in the classroom, and narrowing the digital divide more effectively.

Goals

The main goal of the research was to examine what process teachers use to change their pedagogy to deliver effective instruction using Web 2.0 tools. In particular, what decisions were made to adapt the lessons and activities, and the reasons behind those decisions were examined. A phenomenological approach was used to gather data

using the teachers' voices about their professional growth as they adapted pedagogies with Web 2.0 tools in the secondary classroom. The purpose of this research was to understand how teachers work through the TPACK framework as they learn new Web 2.0 tools and adapt them for use with secondary students.

This qualitative phenomenological approach used the TPACK framework to explore the process that occurred as teachers adapted Web 2.0 tools to change pedagogy in secondary classrooms. Using the lens of teachers' lived experiences as teachers adapted their pedagogy to utilize the new Web 2.0 tools, with the TPACK framework to focus the investigation, this research provides implications for professional development.

Because the TPACK framework developed by Koehler, Mishra and Yahya (2006) is supported by researchers (Archambeault et al., 2010; Bull & Ferster, 2008; Harris & Hofer, 2011; Ward et al., 2009; Williams et al., 2010) as an effective way to measure a teacher's change process in adapting pedagogy and technology, it was utilized in this study to frame the research questions. The following questions guided the research and focused on the teachers' technological, pedagogical, and content knowledge and the relationship between them:

1. What Web 2.0 tools were used in the classroom by teachers and students?
How were these tools being utilized? Why were they being used?
2. What are teachers' opinions regarding the technological factors, such as access to web sites, computers, or speed of the internet, which either supported or hampered their use of Web 2.0 tools (Levin & Wadmany, 2008; Koehler, Mishra, & Yahya, 2006)?

3. How did a teachers' knowledge of their content impact the decisions they made for choosing specific technological tools to teach that content (Mishra & Koehler, 2007)?
4. How was pedagogy adapted for using the Web 2.0 tools, particularly studying teachers' opinions on which parts of their classroom practices were successful or unsuccessful and why (Levin & Wadmany, 2008; Koehler, Mishra, & Yahya, 2006)?
5. What activities with the Web 2.0 tools did teachers feel were easily adapted to teach their content (King, 2002; Mishra, & Koehler, 2007)?
How did they learn about those activities?
6. How and why did the use of the Web 2.0 tools improve teaching or learning?

Because these questions examined teachers' lived experiences, they lent themselves to a phenomenological study. Cilesiz (2011) built a contextual framework, and proposed a theoretical framework, for using phenomenology for an in-depth look at educational technology in classrooms. Her contextual framework contained a strong research base focusing on teachers' experiences with integrating technology into classrooms. Her theoretical framework suggested that a phenomenological approach is the proper methodology for researching the adaptation of pedagogy and technology because it looks at the "essence" of the meaning of the experience. Essence refers to common or universal conditions or quality of an experience (Cilesiz, 2011; Creswell, 2003; Creswell, 2007). Gathering data from teachers concerning their experiences with

adapting pedagogy to utilize Web 2.0 tools, and finding the themes in their learning experiences, would develop a deeper understanding of their lived experiences (Creswell, 2007). Using a phenomenological approach for this study tested the theoretical framework developed by Cilesiz (2011), thus adding to the field. Observing teachers as the learner could enable researchers to further their field in adult learning theory. In addition, the implications gathered from the research may help guide future teacher professional development in technology and other educational areas.

Relevance

Several major educational organizations (American Association of Colleges for Teacher Education (AACTE), 2010; International Society for Technology in Education (ISTE), 2007; National Council for Accreditation of Teacher Education (NCATE), 2010; Partnerships for 21st Century Skills (P21), 2009) have identified the skills needed by students to survive and thrive in the 21st Century. The list of skills includes using real world tools, such as computers and software, cell phones, online environments, and voice or video communication in order to thrive in the global digital age (Williams et. al., 2010).

The existing research on teachers' experiences adapting pedagogies to meet those skills is limited. Inan and Lowther (2010) mentioned that a study conducted in 2000 by the National Center for Education Statistics reported that only 23% of over a thousand teachers surveyed felt prepared to integrate technology into their classrooms. Nine years later, Hightower's (2009) report indicated that only 20% of the states required technology training for recertification of teachers. So why is the gap not closing? Johnson et al. (2009) blames the gap on the limitation of resources done by content filtering software

used at the district level, and calls for schools to identify new learning models that shift to becoming learner centered to adapt to current student needs. In other words, solutions lie in loosening the content filters and changing pedagogies. However, how can pedagogy change if teachers are not familiar with the technology?

Crook and Harrison (2008) found that although teachers have used technology for work purposes, only 29% of teachers had contributed to a blog or uploaded videos to a website. Only 9% had participated in online discussion boards for educational purposes, and only 4% were involved in social networking. Although Wopereis, Sloep, and Poortman (2010) utilized online discussions in an internship situation with student teachers, their study indicated that while weblogs enabled reflections on teaching experiences, and connections with peers, the researchers felt that student teachers' reflections did not go deep enough to cause change in instruction. Harris, Mishra, and Koehler (2010) stated that professional development has focused on the technical skills needed rather than on content standards or students' learning needs. Brown and Crawford's (2005) study of a professional development project with mathematics teachers questioned the reflections of teachers. Although teachers' responses indicated that they were integrating technology more after the professional development, the directors of the project saw very few "student samples" that validated this integration.

From the examples above, it was evident that the existing research on the use of technology and particularly Web 2.0 tools in K-12 classrooms indicates that further research is needed to explore the relationship between teachers, their content knowledge, pedagogy, and the technology. This phenomenology gave valuable insight from the teachers' viewpoint on how these tools can be adapted by teachers and utilized to bridge

the digital divide between digital natives and immigrants and therefore was timely and relevant.

Significance

This study will have educational significance for professional development and classroom practice as suggested by King (2002). The data gathered in one public school district will aid school leadership in understanding decisions made by teachers concerning pedagogical choices. The implications of the study can provide leadership with information on how to best prepare staff development opportunities that guide teachers in implementing the Web 2.0 tools in the classroom, as well as give ideas on how to support the teachers through the professional development process.

The work is original in that previous research has focused on teacher professional development in instructional technology with pre-service teachers (Brown & Crawford, 2005; Levin & Wadmany, 2008; Linckels et. al, 2009; Scrimshaw, 2004), or with in-service teachers on individual tools such as Webquests (Unal & Unal, 2010). These studies focused on making teachers familiar with the technology, rather than adapting pedagogy and content knowledge to utilize the technology.

Recent studies of pre-service teachers have determined that teachers follow the TPACK framework in learning to adapt their pedagogy to utilize the technology. This research examined the teacher process with in-service teachers on a variety of Web 2.0 tools and focused on how they adapted pedagogy (Pan & Franklin, 2010).

The research adds to the existing literature in the field of teachers' professional development on instructional technology by giving an in-depth view of teachers' perceptions and their growth process when adapting pedagogy to utilize technology,

particularly Web 2.0 tools. This research points to ways to make the change process easier for teachers, administrators, and students.

In addition, utilizing a rigorous phenomenological approach tested Cilesiz' (2011) conceptual and theoretical framework of the methodology as a primary research method for educational technology. The use of the TPACK framework during the interview process further tested that framework as an additional tool for research with in-service teachers.

Barriers and Issues

Many of the previous barriers that have challenged educational technology in the past still exist today and were considered in this research study. One of the biggest barriers according to Batson (2008) was the accessibility to new technologies in school buildings. This limited utilization of the technology may have increased the digital divide. Along with those challenges, the tight focus on filtering of information technology sites, which were based on pre-Web 2.0 learning assumptions existed. Recently those filters have been loosened in the district being researched to enable the use of Web 2.0 technologies. Finding teachers that were experienced enough in using Web 2.0 technology in the classroom would previously have been a challenge. However, since professional development on the topic occurred in September 2010, and will continue this year, a core sample of teachers was found that were able to provide their lived experiences.

In order to conduct a rigorous phenomenological research study, the methodology suggested by Cilesiz (2011) was followed. The first component consisted of two in-depth interviews with teachers who were using the technology in the classroom. Each

interview was approximately an hour long, and conducted with seven in-service teachers. With the length of the interviews, they needed to take place outside of the school day, thus committing both the teacher and researcher to extra time. Since the shared details of a life cannot be compensated financially, the researcher reciprocated by providing a service such as additional training or mentoring on an advanced Web 2.0 tool to each participant. This committed the researcher to additional time for preparation and teaching the topics for mentoring.

One of the barriers or issues of phenomenological research is the inherent challenge of suspending the researchers' own ideas on the reasons for the problem or its solutions, also known as *epoché* (Moustakas, 1994). Moustakas suggests the process of "bracketing" their beliefs and understanding in an effort to suspend their natural standpoint so that the mind can be opened to listening to that of the participants. In addition, the participants are called co-researchers by Moustakas (1994) due to the third set of interview questions where the researcher brings back the interpretations analyzed from previous interviews, and asks the co-researchers to validate the interpretation to be sure that the researchers' interpretation is correct.

Limitations and Delimitations

The limited amount of time that access to Web 2.0 tools has been available to teachers in the district being researched, and the fact that professional development on the topic has only occurred in the last year, did not impact the availability of teachers that are exemplars of utilizing the tools. Internal validity was aided by focusing the selection of participants to teachers who have utilized the tools for at least a semester, or have taken formal courses on using the tools, whether an in-service workshop or courses

offered by higher education institutions. An additional participant volunteered, and even went through the interview process, but during the data analysis, it was determined that most of his Web 2.0 experience occurred at the higher education level. So to protect the internal validity of the study, this participant's data was not used. In addition, due to the timing of the study near the end of the school year, and the lack of availability of teachers during the summer, the third interviews with several teachers were conducted digitally through email correspondence. Teachers edited the textural-structural synthesis using the track changes and comment function of Microsoft Word to give their feedback as to the validity of the data interpretation.

Due to the nature of phenomenology being focused on the "lived experiences" of individual participants who participated in the same phenomenon, the results cannot be generalized and therefore generalizability is not expected in this study. However, the concepts learned in this study may lead to further testing with other types of research approaches, thus adding to the research base.

Definitions of Terms

American Association of Colleges for Teacher Education (AACTE): A national organization of public and private colleges and universities dedicated to high quality professional development of educators (AACTE's home page @ <http://aacte.org/>).

**New* Digital divide:* The gap created between students and their teachers characterized by the lack of technology use in classrooms versus the constant use of digital technologies in the students' everyday world (Speak Up 2010, 2011).

Digital immigrants: People born before the popularization of the World Wide Web in the early 1990's. As immigrants to a digital environment, they learn to adapt to that environment rather than being born into it. The digital world is their "second" language and they utilize it differently than digital natives. (Prensky, 2001)

Digital natives: People born after the popularization of the World Wide Web in early 1990's and characterized as the first generation to grow up with pervasive technology (Prensky, 2001). As natives, they have spent their entire lives surrounded by digital technologies. As learners, they seek out resources to learn on their own often following a passion or topic not covered in school, or use the internet to self-remediate on topics in which they feel they need extra help (Speak Up 2010, 2011).

Content knowledge: "Knowledge about the actual subject matter that is to be learned or taught" (Mishra & Koehler, 2007, p. 5).

In-service training: Training for teachers already in a classroom. Activities can include workshops, participation in classes, attending conferences, activities conducted at the school level or as part of a Personal Learning Network (PLN) (Author).

Integration Specialist: a computer teacher assigned to a school to work with teachers and their classes as the technology assistant. This teacher helps the teachers look at their curriculum and figure out what technologies may assist the learning of that curriculum. The integration specialist also creates help materials for the teachers and

students to utilize while learning the technology tools. (Author)

International Society for Technology in Education (ISTE): An association that advocates for the utilization of innovative and effective uses of technology to promote excellence in learning. Advocacy includes providing professional development as well as developing the standards for technology use for Students (NETS*S), Teachers (NETS*T), and Administrators (NETS*A) that are internationally used in education. (ISTE @ http://www.isteconference.org/ISTE/2012/about_us/).

National Council for Accreditation of Teacher Education (NCATE): Organization that is in the process of accrediting higher institutions of learning particularly those involved in training teachers, school specialists and administrators (NCATE @ <http://www.ncate.org/Public/AboutNCATE/tabid/179/Default.aspx>).

Partnerships for 21st Century Skills (P21): A national organization which advocates for students to be ready to compete in a global innovative economy. The organization provides tools and resources to U.S. educational systems and advocates for local, state and federal policies to support critical thinking, problem solving, communication, collaboration, creativity and innovation in schools. (P21 @ <http://www.p21.org/>)

Pedagogical knowledge (PK): Knowledge about teaching and learning methods that is based on educational purposes, goals, and values. PK can also include classroom

management, developing lessons and assessments, and methods and strategies used in a classroom (Mishra & Koehler, 2007).

Pedagogical Content Knowledge (PCK): Knowledge about conditions that promote learning including curriculum, assessment, reporting and pedagogy (Mishra & Koehler, 2007).

Phenomenological research: Research that includes a systematic method to examine and describe the “lived experience” (Creswell, 2003) of participants to understand the meaning and nature of a phenomena (Cilesiz, 2011).

Pre-service teachers: Individuals in a program studying to become teachers. Programs usually consist of training in curriculum and instruction, pedagogy, technology, and content. (Author)

Professional Development: Participation in activities to improve instructional capacities. Such activities can include research, participation in classes, workshops or conferences, or extra time spent to learn something new about content or technology.

Technological Content Knowledge (TCK): An understanding of the connection between technology and content and how one affects the other. (Mishra & Koehler, 2007).

Technological Pedagogical Content Knowledge (TPACK): An understanding of the interaction of content, pedagogy, and technology knowledge. All three components need to be examined simultaneously, and cannot be separated. It includes using pedagogical techniques that utilize technologies to teach content, and the understanding of how that affects learning (Mishra & Koehler, 2007).

Technological Pedagogical Knowledge (TPK): An understanding of the relationship between technology and learning particularly how learning changes when technologies are utilized. TPK can include knowledge of the constraints of technological tools as well as how they fit into pedagogy and strategies (Mishra & Koehler, 2007).

Technology Knowledge (TK): The understanding of information technology deeply enough to be able to use it productively in order to achieve goals and adapt to changes in information technology (Mishra & Koehler, 2007).

Web 2.0: The version of the World Wide Web that includes applications which allow for collaboration and interactions between users (Lemke, Coughlin, Garcia, Reifsneider, & Bass, 2009). Such applications may include Facebook, You Tube, Google Docs, wikis, blogs, podcasts, discussion boards, and many others where interaction and sharing can take place.

Summary

The *New* digital divide between teachers and students needs to be bridged in order to prepare students to survive and thrive in the 21st century global workplace.

Professional development for teachers has focused on giving teachers technical skills but has not progressed to helping them develop pedagogies that are an effective use of the technology in order to meet the needs of their students. Research has shown that professional development can cause change in teaching if that development is framed around the teacher's technological, pedagogical, and content knowledge. However, the teacher's perspective has not been studied enough to understand what teachers go through in their professional growth to enable changes in their pedagogy. This phenomenological study captured the lived experiences of teachers adapting Web 2.0 technologies in order to give further insight on how to make the transition of pedagogies easier and more effective.

Chapter 2

Review of the Literature

Historical Overview of the Theory and Research Literature

In order to understand the digital divide between teachers and their students and the need for using Web 2.0 tools to bridge that gap, several areas are discussed in this review of the literature. Looking at the needs of digital students as learners will give us insight into what teachers need to be able to know and do to meet the needs of those students. Examining the history of professional development for teachers will give a better idea of what has been done, how much impact it has had on changing pedagogy, and what has worked or not worked in the past to utilize technological tools for instruction. In addition, a review of Web 2.0 tools gives an overview of what teachers can utilize for instruction. Finally, examining recent research into the TPACK framework used to guide professional development, and the phenomenological research methodology, provides a framework to guide this study to be rigorous and valid.

The *NEW* Digital Divide

Students born into the communication age of the internet in the late 1990's and early 21st century were identified as "digital natives" by Prensky (2001) and later described as neo-millennials by Smith (2009). According to Smith, neomillennials were born between 1990 and the late 2010's, lead wired lives, and think differently. Due to

online gaming and virtual environments, students have developed fluency in communication and expression. They collaborate to seek and absorb information using different media. This leads to active learning and an expectation for real and simulated experiences in the classroom. Livingstone and Helsper (2007), however, found gradations in the amount and quality of use even between young people. The researchers identified demographics, use, and expertise as variables that accounted for these differences and defined the digital divide as divisions “within and across societies according to access to digital technologies and those that do not have access” (Livingstone & Helsper, 2007, p. 672). In contrast, Morris (2011) found that although providing students with laptops provided students access to social networking sites and therefore life skills, determining the impact of those technologies in supporting learning was not able to be measured. The researcher advised that more research needed to be done to measure the actual impact upon a pupil’s life skills as well as on learning across different programs and authorities.

Jukes (2007) had identified the current generation of students as having a get information “as needed” mentality, set on understanding the world, not just aware of facts about the world. Since the amount of information grows at an exponential rate making it impossible to memorize just the facts, the “as needed” learning style continues to flourish. However, Jukes also stated that the disconnect between teachers, or school systems, and their students has caused many of today’s graduates to be highly educated, yet unprepared for the world beyond the classroom.

AACTE (2010) points out that not only do we have a gap between teachers and students, but also between our students and those they will compete with on an

international level with advanced skills. In focusing on the national achievement gaps, the nation has not given the attention needed to the growing competitive demand for advanced skills such as critical thinking and problem solving. This lack could negatively affect our economy. The economy has shifted from being a manufacturing one to a service based one depending on information, knowledge, innovation, and creativity.

Jukes (2007) agrees with AACTE's interpretation stating that politicians try to fix this challenge by trying to raise test scores. However, tests are based on the lower order thinking skill of content recall but due to the influx and constantly changing availability of information, that content is quickly outdated. He suggested five points to bridge this gap including shifting instruction to higher level thinking skills, embracing the online world, addressing the shift in thinking patterns of today's youth, broadening evaluation to include a more complete picture of a students' abilities rather than standardized tests, and improving the connection between instruction in the classroom and the outside world. To address these five points, it was suggested that changing the way schools work, specifically what a classroom looks like, the school timetable, and looking at methods of delivery to consider virtual learning may be solutions.

Jukes' (2007) ideas were validated by the 2010 Net Day report (Speak Up 2010, 2011) presented to the United States Congress in spring 2011, which stated that these digital natives are now being identified as "free agent learners" because of their propensity to learn outside of the classroom on their own time and in their own place. The survey identified that today's youth utilize technology on a daily basis, with fifty percent of current 6th graders updating their social networking site on a regular basis. Fifty percent of 6th graders have cell phones and another third have smart phones. The

students also claimed that school firewalls are blocking the web sites they need for their schoolwork, thus stifling their learning. In contrast, of the teachers studied in Crook and Harrison's (2008) statistics, only 29% of teachers had contributed to a blog or uploaded videos to a website, and only 9% had participated in online discussion boards for educational purposes, and only 4% were involved in social networking. This does indeed show a fundamental disconnect between teachers and students (Jukes, 2007).

Teachers have not grown up in that digital world and therefore are reluctant in changing pedagogy to match their students' expectations. Teachers, identified as the digital immigrants by Prensky (2001), were born before the World Wide Web was launched in 1991 by Berners-Lee, and raised in the traditional educational system of the 20th century. As such, teachers are not as comfortable with the digital tools. Digital immigrants turn to the information highway as a second source of information rather than as a first source as their digital native students do. In addition, they were socialized differently, and as such the language of the digital world has become a "second language" to them. Therefore, they are speaking in a language that is heavily accented by the past to their students who struggle to make the connections from the past and apply them to their future world of work.

According to Kumar and Vigil (2011), even pre-service teachers, who could be identified as digital natives because of their ages, utilized Web 2.0 tools for personal purposes and to study together in their classes, but only 5-6% of them used the tools academically. This gap still exists in 2011 according to the Speak Up National Findings 2010 (2011) which showed the results gathered from teachers and administrators. Only one third of teachers stated that their classrooms were digitally rich environments on any

given day, and only 25% of teachers say they allow students to create their own digital content. The results also indicated that administrators at state and local levels are concerned about teachers' capabilities of integrating technologies into curriculum. Many administrators and teachers see the potential for utilizing mobile, online and blended learning but the reality of making it happen are challenged by budget constraints, concerns about how to evaluate new technologies, and how to make the connections in the community that would aid in transforming classrooms to bridge the divide for students to become 21st century workers as mentioned by Jukes (2007).

Spivy, Young and Cottle (2008) stated that even with understanding the need to provide students with 21st century skills, actually succeeding in integrating the technology becomes overwhelming to most teachers. The monthly turnover of new technologies makes teacher learning a never ending task. In addition, new technologies bring concerns about students' safety while using the tools and a loss of instructional time needed to teach the students the new tools. Johnson et al. (2009) agreed that integrating technologies into the K-12 classrooms has been difficult not only for the safety reasons which caused districts to restrict internet access in schools, but also because learning to evaluate collaborative student work in environments such as podcasts, blogs, and wikis is difficult. They identified that the value of collaboration in online environments is increasing because of its place in the global workplace. Therefore, a shift to new learning models is needed to meet the needs of current students who will be working in that global economy.

Web 2.0 Tools as a Bridge

Web 2.0 tools may be just the solution to bridge the gap between those future global workers and their teachers. According to Spivy, Young and Cottle (2008), some of the components of these tools will help digital immigrant educators migrate into the 21st Century.

Brown (2010) points out that applications such as Flickr, You Tube, Facebook, blogs, wikis, Google docs, and folksonomies, could lead to a paradigm shift to e-learning. Utilizing wiki tools with pre-service teachers helped them understand how to develop a web presence in preparation for professional careers in O'Conner's (2010) study. Use of the wikis showed the potential teachers how they could learn from their colleagues, and that because their colleagues would see their work, the standard for achievement was raised. In addition, the transparency of the work gave the instructor a way to oversee student participation. Greenhow, Robelia, and Hughes' (2009) had called for increased research on Web 2.0 tools to find out how they impact learner participation and creativity, and the formation of online identities, so the teachers' experience in Brown's study shows that the development of an online presence is important for both teachers and students. However, Brown's studies also pointed out the need to structure and scaffold the content as well as the learning process for both teachers and students. Houa, Changb, and Sungc (2009) found that when teachers used blogs in courses, they used them for knowledge sharing, but not constructing new knowledge. They suggested including interactive activities such as data mining, peer evaluations or tutoring, and problem solving to structure the learning beyond the knowledge sharing stage.

Schuck, Aubusson, and Kearney (2010, p. 234) called the forming of an online presence particularly with adolescents, a “virtual ethnography” meaning ethnography existing in cyberspace, and encouraged research on the ethical challenges of this new culture, particularly ways in which school organizations can be involved in this culture. Due to the complexities of the relationship between young people and social networking and publishing technologies, it was suggested that no single theoretical framework was available to explore adolescent’s informal use of the social software. Therefore, a multidisciplinary approach involving sociocultural learning theory, popular cultural studies, and educational technology should be included in the virtual ethnography to analyze the phenomenon.

Another reason that Web 2.0 tools may be the solution to the digital divide is Ward, Lampner, and Savery’s (2009) thoughts about knowledge creation through participation in social activities. Students in the online environment understand that they are creating content and feel socially connected through that participation. However, this also raises concerns about ethics challenges involved with creating and sharing the content. O’Conner (2010) addresses these concerns with suggestions for organizing materials, encouraging teams of students to articulate their work process, generate class standards for success, and be aware of intellectual property issues.

Bos and Lee (2010) felt that the read/write functions of Web 2.0 tools were perfect delivery tools for Problem Based Learning and Project Based learning, two instructional strategies that enable the teaching of 21st century skills. With the participatory nature of Web 2.0 tools, students learn from the insights of others and clarify their own thinking, leading to metacognition and self-regulation as learners. Their

position agrees with Windschitl's (1998) previous request for research on using the web for student inquiry and communication.

Anderson (2007) points out that Web 2.0 provides tools to encourage solving technical problems and provides a format that encourages students to ask questions, and seek answers. With digital native students arriving at schools entrenched in a social web that encourages seeking answers and mentoring each other, it poses challenges to teachers' views about technology. The use of Web 2.0 tools would enable teachers to change their educational beliefs and eventually their classroom practices (Bull, Hammond & Ferster, 2008). Therefore, research needs to be conducted to find the barriers and issues that prevent this change.

Bull, Hammond, & Ferster (2008) pointed out that since curricular objectives vary across the disciplines, the Web 2.0 tools may be flexible enough to be shaped to specific demands of the curriculum, making it easier for teachers to change their pedagogy.

In addition, according to Speak Up 2011 National Findings for K-12 Teachers, Librarians & Administrators (2012) there has been a major shift in teachers' online presence as well. The data said that fifty-two percent of teachers had taken an online class for training compared to twenty-one percent five years ago. Also, forty percent of teachers participate in online professional development communities compared to twenty-five percent five years ago. This trend might indicate teachers are ready for the use of tools in the classroom.

Even with the above studies, the research on Web 2.0 tools is just beginning to occur. In a literature search, a copious amount of conference proceedings and descriptive accounts become available, showing interest in the topic. However, limited peer reviewed

studies were available, leaving a gap in the literature. Therefore, research into this topic is timely and relevant, and will enrich the knowledge base. Examining teacher's lived experiences as they adapt these tools to their pedagogies will help researchers understand the extent to which the needs of both digital natives and immigrants can be met.

Digital Natives' Learning Needs

The future world of work has been identified by the United States Department of Education Office of Planning Evaluation and Policy Development (2010) as one that will need students to have a well-rounded education in order to contribute as citizens in our democracy and to thrive in a global economy. The list of skills needed by students for success in that global economy of the 21st Century is quite long as per several well-known educational institutions (AACTE, 2010; ISTE, 2007; NCATE, 2010; P21, 2009). See Table 1 for a comparison chart of the four academic institutions.

In 2007, ISTE created the National Educational Technology Standards for Students (NETS*S) to give guidelines for what students would need to know and be able to do. The standards follow six strands including creativity and innovation, communication and collaboration, research and information fluency, critical thinking, problem solving, decision making, digital citizenship, and technology concepts and issues. To exhibit creativity and innovation skills, students should be able to apply existing knowledge to create original works, as well as be able to explore complex systems and issues in order to identify trends and forecast possibilities. Being able to communicate and collaborate using digital media and social networking environments in order to learn and encourage the learning of others, will be needed by students in order to engage with different cultures and contribute to project teams to create products or solve

AACTE	ISTE	P21	NCATE
Creativity & innovation	Creativity & innovation	Creativity & innovation	Creativity & innovation
Depending on information sharing & team networking	Communication & Collaboration	Communicate & collaborate	Communication & collaboration
	Research & Information Literacy	Find information quickly	
Critical thinking	Critical thinking & problem solving	Critical thinking solve problems	Critical thinking, problem solving
	Digital citizenship		Cross-cultural skills
	Technology concepts	Use technology effectively.	
Self-direction		Self -direction have initiative	Having initiative
Flexible working arrangements.		Being flexible Adaptable	Life and career skills such as flexibility
Decision making		Leadership & responsibility.	Leadership

Table 1 - Chart of 21st Century Skills needed as per 4 Major Educational Institutions

problems. The ability to utilize digital tools to research and problem solve involves using inquiry learning, and higher level thinking skills to collect, analyze, and

evaluate information from diverse perspectives to think critically and make decisions to solve global problems. All these skills are dependent on students having knowledge of technology concepts and systems, and knowing how to practice safe and responsible use of those systems to become leaders in a digital world. Williams, Foulger, and Wetzel (2010) identified the list of technology to include using real world tools, such as computers and software, cell phones, online environments, and voice or video communication in order to thrive in the global digital age.

AACTE (2010) concurs with ISTE, reiterating that the global achievement gap does indeed exist. United States students fare poorly on international assessments compared to competitors from other countries. The scores from these international tests, such as the Programme for International Student Assessment (PISA) have been proven to impact a country's gross domestic product (GDP). Changes in the nature of work over the last several decades has changed the global economy to include eighty percent of jobs in the service sector, which include high wages, growth, and skills occupations in industries that are globally interconnected and constantly emerging. Many of these industries have less centralized decision making and depend on information sharing and team networking with flexible working arrangements. In order to meet the needs of these industries, AACTE claims that students will need to be able to work with self-direction, creativity, critical thinking, and innovation. These skills will be a basic requirement for survival no matter whether that student enters the workforce directly, or attends a vocational school, community college, or university.

P21 (2009) agreed with AACTE stating that the skills needed will include self-direction, creativity, critical thinking, and innovation, and added that students who

develop those skills will be able to solve problems, communicate, collaborate, find information quickly, and use technology effectively. In addition, their framework stated that students will need life and career skills that include being flexible, adaptable, have initiative and self-direction, and develop leadership and responsibility. In order to ensure that students master these skills, five critical support systems were suggested. These include creating standards, curriculums, assessments, and learning environments for students, and providing professional development for teachers around the 21st century skills. The Committee on Workforce Needs in Information Technology (2001) adds developing students' cognitive abilities of logical thinking, problem solving, analysis, careful observation, and data management to the list of needed skills.

Several individual researchers concur with these institutions. Burkhardt et al. (2003) agreed that problem-solving skills will be needed, particularly noting students need to be able to change with the technology that will be used by future business organizations, and added interpersonal skills to the list. Bos (2010) stated that problem based learning (PBL) using Web 2.0 tools is a natural fit for teaching the above mentioned skills.

Burkhardt et al. (2003) and Kist (2003) have been more specific about skills that will be needed for the 21st century. For example, literacy skills have evolved to include more symbol systems than previously. Conventional print text has expanded to include hypertext, as well as multimedia. Therefore, students need to develop methods for decoding, developing, and applying these new systems (Burkhardt et al., 2003). In addition, Kist (2003) expressed the need for students to demonstrate the ability to discuss and reflect on the characteristics of the multiplicity of codes thrown at them. For

example, graphics in ads produce very mixed messages, and students need to be able to interpret those messages. Also, being able to discuss and reflect on messages with their peers will improve achievement in the classrooms. Returning to a group to share their reflections, as well as plot out progress for projects is a crucial skill that will be needed to collaborate on an international level. These skills cannot occur in a passive classroom, so students need to be active readers and writers of text, as well as constructors in internationally collaborative projects. Teachers need to create the active classroom for students.

Digital Immigrants and Professional Development

Meanwhile, teachers as digital immigrants are far behind their students in learning the tools and applying them in the classroom. Despite efforts to train teachers on the technology, teachers still lack the confidence to change their pedagogy for the best uses of the tools. Brown and Crawford's (2005) study indicated that although teachers felt math technology training using calculators was successful, the lack of "student snapshots" observed during classroom observations did not validate that integration of the technology actually occurred. As per teachers' opinions in Levin and Wadmany's (2008) case studies, technological applications were not matched with textbooks or curriculums thus making it difficult for teachers to adapt their pedagogy. In addition, teachers' reflections indicated that the change process was a continuum beginning with external influences and progressing through interactions with both students and other teachers, and ending with their own reflections on changing pedagogy.

Wang, Ertmer and Newby (2010) identified that two conditions can impact teachers' self-efficacy beliefs regarding integrating technology into the classroom. The first factor that positively impacted teachers' beliefs in themselves to be able to integrate technology was utilizing vicarious learning experiences to observe other teachers successfully integrating technology. In their study, use of a CD with exemplary lessons created the vicarious examples. The second factor found to impact teachers' self-efficacy was incorporating goals in the learning experience. If teachers were given specific learning objectives, they were more successful in believing they could integrate technology.

Spivy, Young and Cottle (2008) felt that teachers and classrooms are beginning to focus on having students gathering and evaluating data in order to obtain the needed 21st century skills of making informed decisions and interacting with each other. However, the process of making these changes using new technologies can be overwhelming due to the concerns about students' safety online, and losing instructional time to teach students the technology.

Unal and Unal's (2010) study on the use of Webquests validated Spivy's opinion to a certain extent. This study showed that even though 95% of teachers trained to create and use webquests believed they would use them in their classrooms in the future, only 17 % were actually using them for teaching students. However, contrasting with previous studies done on Webquests, the concerns and negatives against using webquests voiced previously were not voiced by teachers in this study. In other words, the change process is slow, and classrooms are just beginning to reflect the environment that students use personally on a daily basis.

The need for teachers to adapt pedagogy to encourage enquiry, and change the student-teacher relationship, is challenged by the incompatibility with the goals of educational entities. Teachers use new tools to present information and manage learning, but deliver old pedagogies to be in compliance with mandates of district, state, and federal standards (Levin & Wadmany, 2008; Scrimshaw, 2004).

In a literature review, Daly, Pachler and Pelletier (2009) reiterated Schrimshaw's (2004) statements concerning the inter-relations between administrators' and teachers' needs and noticed that very little change had occurred in the ensuing years. It was also noted that the literature focused on schools considered as exemplars of technology use but did not help in understanding how schools made the previous transitions from level to level to become those exemplars. Therefore, additional research was suggested to discover how schools and teachers get from skills training on technology tools to application of technology in teaching and learning.

Levin and Wadmany (2008) cautioned that professional development needs to not only create teachers who are technicians or experts in the technology, but also as professionals and critical thinkers knowledgeable about learning theories and methods of teaching. Kingsley and Unger (2008) felt that teachers need time to reflect on giving up some aspects of their authority in the classroom, and envision the educational possibilities that the new literacies create.

These findings supported King's (2002) earlier study which had demonstrated that transformational learning principles provide insight into how critical reflection and development can assist in the transformation of pedagogy.

Chalmers and Keown (2006) defined three elements of professional development in continuing education. These include active teaching in the classroom that includes core concepts leading to lifelong learning, being able to personally reflect and grow through changes, and having interactions with other teachers to deconstruct old ideas and reconstruct new pedagogies. Wells (2007) agreed that long term collaborative support from instructional leaders was a key factor influencing pedagogical change. In addition, he identified other key design factors such as the length of time devoted to professional development, technical and pedagogical support, and developing learner centered activities that focus on student engagement that particularly encourage the change process with teachers.

AACTE's (2010) study of pre-service teachers' active participation in learning communities, in order to tap into the expertise of others through coaching, mentoring, and team teaching, is an example of Wells' (2007) view on collaborative support. In addition, the organization extended the professional needs of pre-service teachers to include the ability to develop curriculum that aligns with standards for 21st century learners, is project oriented, and uses a variety of assessment strategies to evaluate student performance. The capacity to develop curriculum to meet the needs of 21st century students in a constantly emerging economy is critical. Teachers do not know how to do this intuitively, so teacher educators and in-service professional development are encouraged to utilize the technological, pedagogical, and content knowledge framework particularly stressing technology skills to improve educators' capacity to teach 21st century skills.

Pan and Franklin (2010) felt that pre-service teachers presently in our universities are considered part of the digital native group, and should be up to date with technology, however, the data from their pilot study indicated that universities still struggle to get pre-service teachers to master the skills, dispositions, and self-efficacy to utilize Web 2.0 tools in the classroom. It was suggested that the study should lead to research dealing with in-service teachers. Spaulding (2010) compared groups of preservice and in-service teachers' self-reported technology skills with their perceptions about technology integration and found that overall, preservice teachers felt more confident about their technology skills and their ability to integrate them than did the in-service teachers.

Levin and Wadmany (2008) conducted a multi-case study of in-service teachers for 3 consecutive years gathering teachers' opinions regarding factors that supported or hampered their use of technology. The results reflected the interrelationship between the teachers' experiences with technology, the factors affecting their use, the changes in their educational beliefs and the parts of their classroom practices. It showed that teacher's progress in adapting the technology in the classroom went through a continuum. At the beginning of the continuum was having the approval of administrators for using the tools in the classroom. At the other end of the continuum was a teacher's self-regulated reflective behaviors on using the tools in the classroom. In between lay the support and collaboration with colleagues and students to encourage the use of the technology thus concurring with Wells (2007). Levin and Wadmany's study identified this change process taking place over three years.

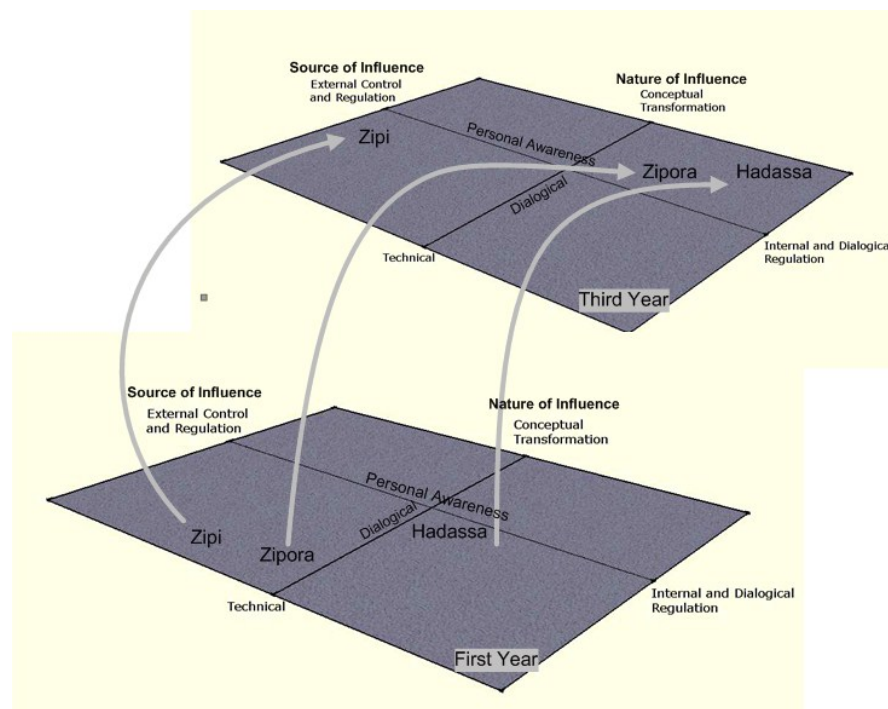


Figure 2 -Development pattern of three teachers (Levin & Wadmany, 2008, p. 245)
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Whitehouse, Reynolds, and Caperton's (2009) study looked at teachers who started with little or no technology savvy and noticed a gain in their skills during the first year, but the step to changing teaching practices was not expected to take place until the second year of the study, which verified the findings of Levin and Wadmany that change was a lengthy process. Charles (2009) reiterated those findings showing that the duration of the professional development correlated with the depth of change teachers experienced. This study also concurred with the value of self-reflection and dialogue with mentors about their own pedagogies to support instructional change.

In contrast to the long professional development models, P21's (2010) study of teacher educators included only 8 hours of professional development coupled by independent implementation, and 2 hours of debrief time at the end of the semester, and faculty indicated that they had not only increased their technological skills, but changed

their pedagogy if only slightly. Of course, most of the teacher educators were already strong on pedagogical knowledge and content knowledge, but this study holds hope that professional development does not have to be long termed to impact pedagogical change.

Yilmazel-Sahim and Oxford (2010) identified three types of professional development for teacher educators. The models included three types including the workshop models, mentoring models, and university-school collaboration models. The skills based models included brown bag seminars or institute type seminars, and project based models focused on technology skills. Mentoring models included plans where mentors could be technology experts or education experts or a combination of both. In the collaboration between a university and school models, experiences were provided for technology professional development for teacher educators, as well as providing rich field experiences for pre-service and in-service teachers. The analysis by Yilmazel-Sahim and Oxford (2010) indicated that the mentoring and university-school collaboration models were the most effective. Mentoring models had the advantage of helping novice users overcome technology fears and advanced users progress more rapidly. University-school models also helped teacher educators and promoted positive long term change but were very complex to arrange and execute. The skills based models were the least effective because training was not tailored to teacher educators' specific needs or interests, and did not offer ways to transform skills into actual practice. Many of the studies used in the research included programs funded by the Preparing Teachers to Use Technology (PT3) grants. Once the funding ended, the programs also lapsed.

According to Smith (2009) the PT3 grants program was an initiative of the Clinton administration in 1999. It was announced during a national conference for the

Society for Technology and Teacher Education (SITE) when the ISTE Nets Standards for Students (ISTE Nets*S) were published. The SITE conference was focused on teacher educators who were knowledgeable about technology and could present this knowledge to future and in-service teachers. The release of the ISTE Standards for Teachers (ISTE Nets*T) at the same time gave teacher educators standards for measuring the technology skills of pre-service teachers. However, true systemic change did not occur due to the variety of programs developed and that many of them were not sustainable when the grant ended. In addition, the fact that many states have adopted the standards for students, but not the standards for teachers, has not supported systemic change (Smith, 2009).

Not adopting teachers' technology standards is evident in Harris, Mishra and Koehler's (2010) view that previous training policies have focused on the technology rather than students' learning needs. Their premise includes the fact that most professional development focused on specific technologies which included examples for use in classrooms, but were not transferrable from classroom to classroom due to technological constraints and differences in content delivery across disciplines. These views led to the development of the TPACK framework for professional development.

TPACK Framework

As per Mishra and Koehler (2007) as far back as 1986, Shulman was developing ideas about how teachers learn and introduced the idea of Pedagogical Content Knowledge (PCK). His concerns were that the research emphasis in professional development treated teachers' knowledge of subject matter and their knowledge of pedagogy as two separate entities. Teacher education programs tended to focus on either

subject matter or pedagogy. He proposed creating a relationship between the two thus introducing the concept of PCK.

According to Mishra and Koehler (2007) the TPACK framework has its roots in research done for educational software design. The consideration of using the triad of content, theory and technology for creating the software, eventually led to looking at Pedagogical Content Knowledge (Shulman, 1986, 1987). Pedagogical Content Knowledge described how effective teaching with technology was interrelated to teachers' understanding of both their content and the technology. According to Mishra and Koehler (2007), the idea of teachers as curriculum designers that need to understand both their content and the technology can be attributed to Dewey. Dewey claimed that teachers are active participants in any reform, and particularly in their classrooms with their particular students. Therefore, teachers need to be involved in being part of the solution to this current digital divide.

Mishra and Koehler's (2007) research over the ensuing years led to their current rendition of the TPACK framework. The major goal of their research was to understand the connection between teachers' thought processes, their ensuing actions, and the observable results of those actions. It extended the existing research at the time to develop techniques for discovering and describing how knowledge is transmitted, and how knowledge changes through that transmission. The researchers encourage viewing all parts of this framework in totality because isolating any of the components only gives a portion of the picture. However, Agyei and Voogt's (2011) study indicated that although teachers self-reported their knowledge of TPACK during professional development in which they developed and taught technology rich lessons, observations of

their classroom practice did not reflect that same knowledge. This raises questions about what happens with teachers when they return to the classroom and apply their knowledge.

Two major organizations involved with education, the AACTE (2010) and NCATE (2010) concur with Mishra and Koehler (2007). AACTE (2010) states that integrating technology requires the ability to juggle the components of technology, pedagogy, and content. In addition, educators need to know how to balance direct instruction with project-oriented teaching methods, and utilize a range of assessment strategies for measuring student success. To accomplish this transformation, teachers will need to participate actively in learning communities, access experts in the fields of their content, and mentor and peer coach fellow teachers, all activities enhanced by the use of technology. The list of what teachers need to know and do goes on to add creating environments that support differentiated teaching, learning, and assessment. AACTE supports the TPACK framework as a tool for understanding the complex issue of professional development needed to achieve the changes needed.

NCATE (2010) issued recommendations for changes in teacher education centering on clinical preparation and experience that would promote teaching core subjects around 21st century interdisciplinary themes. These themes include global awareness and literacies in financial, civic, health and environmental fields. In order to develop these and other 21st century skills, students will need critical thinking, problem solving, communication and collaboration skills, as well as creativity and innovation. Life and career skills such as flexibility, having initiative, cross-cultural skills and leadership are also included in their recommendations. To achieve these goals, NCATE recently proposed that clinically based teacher education programs be developed much

like the training programs in the medical field. Pre-service teachers need to know their subject-area content (CK) extremely well, and they must know their pedagogy (PK) well enough to understand their students' needs and adapt it to their content area and their students' learning needs. NCATE compared proposed programs to those followed by medical students preparing to work as doctors. Medical students become expert practitioners through internships, and NCATE believes that pre-service teachers would benefit from an extended internship in classrooms throughout their entire college program. The use of technology is suggested as a way to enhance the support between teacher educators, cooperating teachers, and teacher interns, so development of technological knowledge (TK) during the internship program is also suggested. Therefore, the new reforms proposed by NCATE, although stated very differently, still show the need to focus professional development around the TPACK framework. The question needs to be asked if higher education faculty and school districts are prepared for these changes and aware of the TPACK framework.

Archambeault, Wetzel, Foulger and Williams (2010) assessed teacher educators' experiences using the TPACK model in their interview questions of the education faculty members. Although their methodology grouped participants based on Rogers (2003) innovation adopter categories, the findings indicated that all participants, despite their innovation category, indicated changes in how they understood technology and pedagogy for their content area. While all participants stated that their technological knowledge increased, most indicated that their pedagogy began with the way they normally teach, but when planning their content objectives they added a technology that was meaningful to those objectives. In addition, instructors who were strong in their content knowledge

at the beginning did not lose their content knowledge, but those that were weak in content knowledge felt their content knowledge grew through the technology.

The development of Technological Pedagogical Content Knowledge (TPACK) framework by Mishra and Koehler (2007) has been utilized by several researchers (Bull & Ferster, 2008; Harris & Hofer, 2011; P21, 2010; Ward, Lampner, & Savery, 2009). Bull and Ferster (2008) used the TPACK framework to examine using a web 2.0 tool, called Primary Access, in a social studies class in which students created a documentary from original source documents on the web. While Primary Access was used successfully in the study, the authors pointed out that it would be used differently in different subject areas. While it was used in their study to support historical inquiry, it could be utilized in Physics to reconcile a students' misunderstanding of concepts, in Language Arts it could be used to provide visual imagery for vocabulary development, and in Math for connecting representations in trigonometry. Therefore, it was suggested that designers of web 2.0 environments should keep content needs in mind when developing the tools for K-12 users.

From the content materials standpoint, Akcaoglu, Kereluik, and Casperson (2011) aimed to refine a rubric to assess pre-service teachers' TPACK, but in the process examined online content from technology companies for TPACK as well. All three companies that provided the curriculum gathered the lesson plans from teachers in the field. The results of their study indicated that online content was strong on all individual constructs except the technology knowledge one. Even though technology was included in the lesson plans, the plans were weak in explaining why technology was important, or any possible limitations that should be planned for, as well as not bridging content,

pedagogy, and technology together. In essence, these results validated that teachers do not successfully integrate technology because they are not aware of the need to bridge content, pedagogy and technology in a way that shows the importance of the technology use.

Schmidt (2009) developed the “Survey of Preservice Teachers’ Knowledge of Teaching and Technology” to gather data about pre-service teachers’ self-assessments of their understanding of the TPACK framework. The survey focused on content areas for which pre-service teachers would be preparing to teach and measured pre-service teachers’ self-perception of their TPACK. The survey was based on TPACK constructs from the literature, received an iterative process from the research team, and then an expert content validity analysis. Different factors emerged for the content areas of social studies, mathematics, science, and literacy within the CK scale. The survey was administered to 100 pre-service teachers who were enrolled in an introductory instructional technology course. Results indicated that there was a significant difference in the teachers TPACK from pre-test to post-test. The study proposed to follow the pre-service teachers into the classroom with their field experience.

Ward, Lampner, and Savery (2009) utilized the TPACK framework along with the ISTE NETS*T to frame professional development for teachers to utilize emerging internet technologies in a Science, Technology, Engineering, and Math (STEM) school. The results of the study indicated that teachers had an increased average understanding of technological knowledge and technology standards for students. In addition, they felt that they had more fluency with technology and systems, and could adapt learning experiences to include technology to promote student learning and creativity.

Jones, Adelson, and Archambeault (2011) were concerned about the validity of the TPACK framework and its seven constructs. They examined the constructs used by Archambault and Crippen (2009) in their study of the TPACK utilized by distance educators. A tailored design survey methodology was used in the Archambault and Crippen study to measure the online teachers TPACK. Jones, Adelson, and Archambault (2011) conducted a Structural Equation Modeling (SEM) analysis of the data collected in the study of online teachers. The results illustrated that enough correlations existed to indicate that TPACK could be moved from theory to practice, but the results would benefit with more samples being tested.

Torrebruno, Paolini, and Di Blas (2010) looked at the constructs in relation the PoliCultura program in Italy, and came to the conclusion that teachers' technological knowledge is desirable, but does not need to be an equal construct with the pedagogy and content ones. Their teachers were able to supervise, manage, and run a highly rewarding technology based learning experience even though they did not have any self-reported technology skills coming into the experience.

Jaipal and Figg (2010) followed four pre-service teachers during their seven week practicum at two K-8 schools. Using a cross-case analysis of the four participants utilizing pre and post group and individual interviews, lesson plans and observations of their classroom practice, the researchers developed a framework that extended the current TPACK framework. They refuted the construct that different content areas have different factors impacting them because in elementary classrooms, teachers often integrate subjects together. They proposed that general TPACK characteristics needed to be

developed that reach across all subject areas. Therefore, the study focused on TK through observation of the CK, PK, and TK components of TPACK.

Howard (2011) gathered quantitative data from 829 in-service teachers taking graduate courses in an online professional development program created with the TPACK framework. The results indicated a moderately significant correlation between a positive assessment of the TPACK in the online courses and classroom technology usage.

Machado, Laverick, and Smith's (2011) qualitative and quantitative data suggested that in-service teachers taking graduate courses targeting TPACK felt more confident in the TPK and TCK, and also changed their understanding of technology from a tool promoting student engagement to a tool for developing student understanding. They suggested further research on how in-service teachers continue developing their TPACK after the graduate courses are over, as well as what impact administrators' support has on it. In addition, it was suggested that research be conducted on what impact teachers with well-developed TPACK have on novice teachers.

Wetzel (2011) tested whether the framework really works in actual classrooms as suggested by Schmidt et al. (2009). He observed and interviewed an experienced 6th grade language arts teacher as she taught in a classroom equipped with one to one computing. The researcher was looking to see evidence of CK, PCK, and TCK existing in a real classroom. The teacher observed was unique in that she was selected by her district to pilot the one to one laptop program with many additional technologies. During the observations and interviews, it became evident that knowledge of content, pedagogy, and technology and the interrelationship between the constructs did happen in an actual

classroom. The use of technology was woven throughout the entire project with students being given choices on using the technology or other techniques for learning materials. Some students chose the technology and even learned it themselves and taught others, while other students chose not to use the technology. Classroom management techniques that made the project possible were discussed and considered as evidence of pedagogical knowledge. The study indicated that TPACK does exist in middle school classrooms, but could not be generalized to other schools due to the unique nature of the program and teacher.

Harris and Hofer (2011) looked more in depth at educators' content needs by examining their instructional planning. The study focused on content-based learning activities because they are the main elements in a teacher's instructional plan. Both before and after professional development, teachers in the study noted content goals and matched learning activities to meet those goals before meeting the developmental needs of learners. In addition, technology was then adapted to enhance the curriculum based learning rather than used for the sake of technology. The researchers developed taxonomies of content based learning activities that can be supported with technology to enhance students' learning needs. These taxonomies can provide an organized collection of optional learning activities for teachers to then choose to match their content goals. This study focused on social studies content goals and provided 44 learning activity types for teachers to utilize when planning to meet the needs of their learners. The activities included knowledge building types of activities such as reading and discussing text, sequencing information, and inquiry. Knowledge expression activities, such as answering questions, building timelines, or creating films, games or exhibits were also

included. The study results indicated that planning priorities for teachers did not change even with professional development, but teachers did think more consciously and strategically about planning instructional activities after professional development. In addition, the study was small scale and focused in one content area, so the researchers recommended further investigation.

Since the majority of recent research has brought the TPACK process from theory to practice, but calls for more research on the topic, this study is timely and relevant, and will extend the existing literature. With the current research pointing to the need for teachers to be aware of their own TPACK in order to change pedagogy to effectively utilize technology for the best learning needs of students, the TPACK framework will be utilized as the theoretical framework to create interview instruments for gathering data from teachers' voices concerning their lived experiences while adapting their pedagogy to Web 2.0 tools. Phenomenology will be utilized to understand the data gathered.

Phenomenological Research Methodology

Roblyer and Knezek (2003) called for a research agenda for instructional technology, particularly ones studied in practice that focused on teaching practices and student learning. Most research has focused on outside factors such as access to technology, support for professional development to encourage integrating technology, and how a teacher's beliefs about technology impacted their integration of technology. However the standardized measures used in most studies cannot measure the subjective nature of the teachers' experiences. Therefore, previous research has fallen short of providing the answers needed to close this present digital divide. Conducting research that would focus on teachers' lived experiences while adapting pedagogy that makes the

best use of the technology will be a step toward bridging the divide. This insight might give additional data to aid in finding solutions to the present problem.

Levin and Wadmany (2008) encouraged an in-depth look at teachers' opinions on the professional development offered to them. They examined not only each teacher's classroom, but their educational beliefs, their own opinion of their abilities, both cognitive and emotional, to learn new materials, and their views on technology. In addition their adaptability to face novel and uncertain situations should be researched. They found that teachers' views defined a continuum from external influences, such as support or restrictions on the technology or support or lack of support from administrators, to the extreme end of becoming self-regulated reflective teachers. In between the two extremes, teachers' dialogue with both students and colleagues were important factors in helping them implement the innovative changes necessary to change pedagogy. In other words, their "lived experiences" impacted their pedagogy.

The focus on researching lived experiences came to the forefront with Moustakas' (1994) textbook on phenomenological research methods. He defined phenomenology (p.26) as "... knowledge as it appears to consciousness, the science of describing what one perceives, senses, and knows in one's immediate awareness and experience. The process leads to an unfolding of phenomenal consciousness through science and philosophy 'toward the absolute knowledge of the Absolute'." The word "phenomenon" comes from the Greek word "phaenasthai" meaning to "flare up, to show itself, to appear." Therefore, phenomenon is a suitable place to start an investigation, but the challenge for human science researchers is to describe things in themselves with intuition and self-reflection. This process involves blending what is present, with what

could be imagined, and looking from the point of possible meanings to be gained from the investigation. Therefore, phenomenological researchers need to develop epoché.

Moustakas credits the development of Epoché to Descartes, and states that Epoché requires the elimination of suppositions, and raising knowledge above doubt. In Greek, it means to “refrain from judgment” and stay away from looking at things in an ordinary way, and be open to looking at things in a naïve way. Researchers construct a question or problem to guide the study, but refrain from making suppositions. The results may provide a basis for further research or reflection.

Once the researcher has completed the reflection phase, the researcher constructs a full description of the conscious experience of the participants’ into a textual description that includes thoughts, feelings, examples, ideas, and situations which portray the experience. Evidence of something that shows itself again and again points to confirmation of the phenomenon. When the participants articulate and describe their experiences, intersubjective validity becomes evident as patterns are perceived in their combined narratives. The researcher’s task, known as phenomenological reduction, is to describe the participants’ experiences, and look again, and describe repeatedly until a textual description can be written of the “essence” of the experience as described by all the participants.

Cilesiz (2011) felt that phenomenology should be adopted as a proper methodology for researching the adaptation of pedagogy and technology because it looks at the “essence” of the meaning of the experience for teachers. Examining this essence could uncover vital processes of using technology to learn and teach that may not have been recognized previously.

Cilesiz (2011) built a contextual framework, and proposes a theoretical framework, for using a phenomenological approach for an in-depth look at educational technology in classrooms. The contextual framework shows a strong research base focusing on teachers' experiences with integrating technology into classrooms. Cilesiz classified the current streams of research on educational technology into three main categories. The first stream of research examined students' experiences in learning through online education, the second stream focused on the experiences of teachers, teacher candidates, and their instructors integrating technology in their teaching, and the third stream investigated users' psychological experiences with computer applications. However, even with those existing research categories, gaps exist in the literature and the literature does not have a framework or construct to focus the research. Creating a framework and construct will unify researchers and make it easier to share a coherent body of research. Cilesiz proposes that a phenomenological approach will create a unifying framework and methodology for such a research agenda. In order to facilitate the adoption of this methodology in the field, it needs to provide clear guidelines on sample selection, data collection and analysis, and ethics and validity.

As per Cilesiz, the systematic attempt utilized in phenomenological research methodology may lead to a deeper understanding of what a teacher goes through in trying to adapt pedagogy and content to utilize the technology effectively. This belief corresponds and agrees with Creswell's (2007) definition of the proper domain of phenomenology as aiming to develop a deeper understanding of several individual's common experiences so as to lead to developing practices or policies. In addition, Creswell claimed that the essence of human experiences as determined by the

participants' descriptions of an experience makes phenomenology a philosophy as well as a method. Cilesiz's (2011) proposes that phenomenology should be used as an approach to studying experiences because it enables an in-depth, comprehensive, and multi-faceted look at educational technology. Giorgi (1997) reminded researchers that a rigorous phenomenological study includes a philosophical background, data collection and analysis and a description of the experience as its output.

The research methodology proposed by Cilesiz (2011) is based on the phenomenological concept of experience. A pre-condition of studying experiences is the selection of participants who have meaningful and significant experiences. Therefore, criterion sampling, or choosing participants who fulfill certain criteria, is the most suitable method (Creswell, 2007) of choosing participants. A sample size of 3-10 participants is considered appropriate for this methodology (Creswell, 2007). The collection of data can be collected through interviews, observations, or written self-descriptions. In-depth interviews are the most suited method for collecting data in transcendental phenomenology and are the framework for use in research in educational technology. Three interviews, of about 90 minute's length, are conducted with the first interview identifying the participant's qualifications for participating in the study. During the second interview, the participants reconstruct their experiences and reflections on those experiences. For the third interview, they are considered to be co-researchers because they give feedback on the interpretations created by the researcher during the data analysis stage.

The data analysis stage includes three parts: phenomenological reduction, imaginative variation, and synthesis (Moustakas, 1994). Horizontalization of the data, or

treating each statement as having equal value and reading it multiple times looking for things related to the topic area, is the first basic step of the phenomenological reduction stage. The use of a peer review is suggested at this stage to examine the selection of relevant statements. The researcher then transfers the data into meaning units, or word/phrases that represent only one meaning, by splitting them whenever there is a transition in meaning. Any repetitions or overlaps are eliminated and meaning units across all participants are listed. Then individual textural descriptions or narratives of each participant's experiences are created.

The second part, imaginative variation, begins with reading the textural descriptions several times from different points of view to understand the underlying individual manifestations of the experiences. This involves identifying the common meanings, making comparisons between statements within individual descriptions and original transcripts, looking for elements that contradict the data at large, then creating individual structural descriptions.

Synthesis involves finding the similarities in structure between the textures of participants. Meaning units shared across all or most of the participants are designated as shared meaning units and combined into a single narrative. The narrative is written in third person to represent the group as a whole and is called the composite textural description. The essential structural elements or representations of experiences common to participants are identified and integrated to create a single group narrative called the composite structural description containing common essential structures. This description then becomes the textural –structural synthesis that contains an in-depth description of the experiences and is the essence of the phenomenon.

Validity in phenomenology comes from implementation of a range of validation techniques and procedures. An essential component is the researcher's engagement in the epoché process, or disciplined, systematic efforts to suspend their own natural standpoint and prejudgments regarding the phenomenon. Creating a subjectivity statement at the beginning of the study can facilitate epoché. Bracketing the researcher's words during data analysis and consistently revisiting the subjectivity statement can minimize the impact of the researcher's idea on the findings. Similarly, utilizing member checks and peer reviews can lessen the impact. Member checks include sharing the researcher's interpretations of the data and soliciting feedback from the co-researchers at the beginning of the second and third interviews. Peer review can be utilized during the horizontalization process to make sure individual statements by participants are given equal value, and all relevant statements are included. In addition, transparency, or enabling readers to understand the context of the study so they can evaluate the findings of the study can increase the validity. The author's subjectivity statement can be part of that transparency, as well as explicitly outlining the steps taken during the analysis, and giving detailed descriptions of things like participant selection, and reporting limitations of the study.

Ethical consideration and reciprocity are two further considerations for any research studies. Due to the reflective nature of sharing the experiences and the possibility of sharing intimate details, the privacy and confidentiality of participants must be protected. The use of pseudonyms for locations or names can protect privacy and guard against damaging professional reputations. In addition, sharing the final report with participants can add to safeguarding privacy. Reciprocity is the ethical consideration

that research should benefit both the researcher and researched. Since the shared details of a life cannot be compensated financially, researchers are encouraged to reciprocate by providing a service such as additional training or mentoring on advanced skills in their field.

Phenomenological research studies consist of rigorous methods that make it a natural choice for studying educational technology, specifically Web 2.0 tools, in secondary classrooms (Cilesiz, 2011). In addition, the reflective nature of the methodology fits nicely with the need to study teachers' TPACK and its relationship to adapting pedagogy for the tools, and therefore will be the research framework to guide this study.

Summary

A digital divide has been created between students and teachers caused by their different uses of Web 2.0 tools on a daily basis. Students raised with pervasive technology have to power down when they come to school and teachers struggle to change pedagogy to meet the needs of these students. Those same Web 2.0 tools could be the solution to the digital divide, if teacher professional development met the needs of teachers. Past professional development has focused on teaching the technical knowledge, but not tied it to content or pedagogy. The TPACK framework has recently been developed to show the connection between technology, content knowledge and pedagogy and guide professional development. Research on TPACK has shown it to be effective in changing pedagogy albeit slowly. The structure of a phenomenological approach can be utilized to give an in-depth analysis of teachers' lived experiences while

adapting Web 2.0 tools that could lead to improved professional development which may bridge the digital divide.

This review of literature has focused on the conceptual framework and history of Web 2.0 tools or digital technologies now utilized in classrooms, and the professional development literature concerning adapting technology and pedagogies, particularly the TPACK framework in order to generate interview questions for the study. In addition, the literature review included a study of phenomenology to find inquiry tools or questions for the gathering of data, and for “coding” the responses to analyze the “lived experience” of the teachers. The phenomenological approach has been planned thoroughly to ensure validity.

Chapter 3

Methodology

Research Methods Employed

With the education research pointing to utilizing digital tools, such as Web 2.0 tools, to meet the needs of today's students, and the need to understand teachers' experiences in adapting those tools into the classroom, the purpose of this qualitative phenomenological research study was to explore the lived experience of teachers implementing Web 2.0 tools in the secondary classroom. Using the lens of the teacher perspective through the TPACK framework, this study uncovered the essence of the challenges and successes of adapting Web 2.0 tools in the secondary classroom and how the teachers grew professionally. Methods of inquiry included phenomenological reflection on data elicited from seven teachers who adapted their pedagogy to use the tools in their classroom. The participants participated in two taped interviews at one week intervals during the school year. As per Cilesiz (2011), the first interview was an open-ended life history interview, followed by the second interview focusing on in-depth reflections based on the TPACK framework of how the teachers adapted their pedagogy to use the Web 2.0 tools.

During data analysis, the researcher transcribed the recordings of each interview verbatim and merged the data from all interviews and processed them for phenomenological reduction looking for meaning units across participants. The next step

was to engage in imaginative variation or combining interpretations to create a textural description of the “what” of each teacher’s experience. Then the meaning units were examined for elements that could explain the “how” of the experiences of the participants which was written as the structural description for each participant (Moustakas, 1994). Experiences were then combined to arrive at shared meaning units which were used to create a composite textural description of the phenomena. Next, this data was used to elaborate, explain, and synthesize the essence of the phenomena into a composite structural description. The composite textural description and the composite structural descriptions were then merged to create the textural-structural synthesis to describe the general essence of the phenomena. This synthesis of the essence of their experiences was sent to the participants as co-researchers to clarify the interpretations of the researcher from the previous interviews. The synthesis was adjusted to reflect their input.

Epoché and Subjectivity Statement

In order to “refrain from judgment” and stay away from looking at things in an ordinary way, and be open to looking at things in a naïve way the researcher engaged in “epoché” and included the following subjectivity statement. The epoché can be read in Appendix A.

Subjectivity Statement

As an educator with close to thirty years’ experience in teaching, and using technology in the classroom, my perceptions of educational technology are broad and extensive. I have participated and planned many different training programs for elementary students, teachers, higher education faculty, custodians and friends. My experiences in three different school districts as a teacher and trainer have given me

experiences in working with teachers as well as students to utilize technology for learning. My experiences in three higher education institutions have expanded that experience to include translating the needs of professors to IT personnel to enhance the learning experience for college students including pre-service teachers. In addition, working with three different virtual school programs, as both a teacher and trainer, has expanded my horizons to that new environment. The different formats for the training I have participated in, from grass roots training of teachers in the district on a volunteer basis, to formal training programs in higher education and at a district level give me a broad and general perception of technology, pedagogy and content. My own pedagogy has developed and changed through the years to meet the needs of my content as well as my students. It is from this varied background that I investigated the phenomenon of teachers' TPACK while they were adapting pedagogy and Web 2.0 tools in the classroom. I made every effort to bracket my beliefs throughout the study.

Participant Selection

Phenomenology requires selection of participants who have significant experience of the phenomenon, and criterion sampling of participants who fulfill certain criteria is the most suitable methodology (Cilesiz, 2011; Creswell, 2007) for participant selection. Therefore eight participants were chosen that meet the following criteria:

1. Had utilized Web 2.0 technology in the classroom for at least one semester.
2. Had taught at least one year in the same content area (CK) and grade level (PK).

3. Were willing to share and articulate their experiences using the tools in the classroom.

Since a phenomenological framework requires a relatively homogeneous group of participants, participants were chosen from a large semi-rural school district located in northeast Maryland, including approximately 3,000 teachers and other certified personnel. Sixty percent of the teachers have an advanced degree which includes at least five years of college, and ninety percent were considered highly qualified. The selection began with a district wide email (See Appendix B) asking secondary teachers that have at least one year teaching experience, and a semester experience in utilizing Web 2.0 tools to participate in the study.

The researcher took the information from the teachers who responded, and checked that they met the minimum qualifications of one year teaching the content and one semester utilizing the tools. Initial contact was made through the district email system. Follow up with each participant included sending an introductory Letter to Participants and the Adult General Consent Form (Appendix C) through the district courier system. When the Participant Release Agreement forms were received, the researcher contacted each participant by email or phone (as requested by each participant) to set up the first two interviews. Since the time before school was dismissed for the summer was scant, the first two interviews were conducted with each participant during the last three weeks of school, with approximately one week in between the two interviews. The third interview was to be scheduled later in the summer after the interviewer analyzed the data.

Participants consisted of one middle school language arts teacher, two middle school computer science teachers, one high school and one middle school science teacher, one middle school music teacher and one middle school social studies teacher.

An additional participant was dropped from the study during data analysis. This participant was currently a substitute teacher in the district, and although during the initial contacts he had utilized the Web 2.0 tools in several different environments, and was an experienced special education teacher, as the interviews progressed it became evident that most of his Web 2.0 usage was in the higher education environment which does not fit the scope of this study. In addition, he had not recently been consistently teaching for a year at a specific grade level or content area.

Data Collection

Data collection consisted of meeting with the participants for two interviews conducted at approximately one week intervals. Each interview was tape recorded for analysis later by the researcher. Interviews lasted approximately one hour in length and were conducted at the teachers' school or another place of the participant's choice for convenience and comfort. The first two interviews were semi-structured with the questions listed on Appendixes D and E for guides. Questions for the first interview were submitted to participants before the interview by email, so that they did not feel uncomfortable during the interview. The second interview questions were handed to the participants with the notes of things to clarify from the first interview so they could read them as the interview progressed. Interviews were customized according to each participant's responses as the interview progressed. The third interview was unstructured and occurred during the summer. Two participants were unreachable for face to face

interviews, so utilized email to critique and read the results, then returned them digitally to the researcher.

Initial Interviews

The first interview was a focused life history (Seidman, 1998) and produced a brief synopsis of each participant, including first name, teaching position, number of students, grade level, school and content area. During data analysis and reporting, pseudonyms were substituted to protect privacy.

Further initial interview questions focused on the participants' experiences in using technology, their content knowledge and knowledge of their pedagogy. In addition, their training on using Web 2.0 tools was explored. Detailed questions can be seen in Appendix D (adapted from P21, 2007).

Second Interviews

A second interview was conducted to delve into depth on the participant's experiences in the classroom with their technological knowledge, pedagogical and content knowledge as it pertains to Web 2.0 tools and their use in the classroom. In particular, what tools were being used by both teacher and students was discussed. Technological factors such as access to Web sites and Internet access were explored to understand the teachers' experiences and its influence on technology use. Content materials and tools were discussed to understand the participant's thinking on where the Web 2.0 tools can help or hinder teaching the content. Learning activities and classroom management were also discussed to understand how the tools can impact teaching and learning. For a detailed example of the questions asked see Appendix E.

Third Interviews

A third interview consisted of open reflection on the meaning of the experiences as interpreted by the research. The researcher shared the general essence of the phenomena in a textural-structural synthesis and asked for reflections from the participants on whether this description explains the essence of their experiences. See appendix G for the directions for this contact.

Data Analysis

The data analysis stage included three parts: phenomenological reduction, imaginative variation, and synthesis (Moustakas, 1994).

Phenomenological Reduction

During this initial data analysis stage, the researcher transcribed the transcripts of each interview verbatim and merged the data from all interviews and processing them for phenomenological reduction looking for meaning units across participants. Treating each statement as having equal value and reading it several times, or horizontalization of the data, was the first step in this process. The data was transferred into meaning units by splitting them at transitions in meaning and created statements that represented only one meaning. Meaning units across all participants were created and listed. Any repetitions or overlaps were eliminated. Individual textual descriptions or narratives for each participant's experience were created from the resulting lists.

Imaginative Variation

The next step was to engage in imaginative variation or combining textual interpretations to arrive at the underlying structures of the experiences of the participants to create a textual interpretation of each experience. Common meanings were identified,

and compared to the other participants and the data at large in order to look for data that contradicted. Individual structural descriptions were created for each participant.

Synthesis

Experiences across all participants were combined to arrive at shared meaning units which were used to create a composite textural description of the phenomena. The similarities in structure between the textural descriptions of each participant were identified, and meaning units shared across all participants were designated as shared meaning units and combined into one narrative. This narrative, called the composite textural description, represented the group as a whole and was written in third person.

The structural elements or representations of experiences, common to all participants were integrated into a single group narrative, called the composite structural description. The combination of the composite textural description and the composite structural description are called the textural-structural synthesis and contains the in – depth description of the experiences and is the essence of the phenomenon.

The textural-structural synthesis was shared with all participants during the third interview during which the participants were considered as co-researchers and gave feedback that led to the final report.

Instrument Development and Validation

All interview instruments developed for this study have been adapted from a combination of questions created by Schmidt, Baran, Thompson, Mishra, Koehler, and Shin, (2009-10) and those created by Harris and Hofer (2011) and used in recent studies. Interview questions are arranged by categories of the TPACK framework, as identified by the initials in the box on the interview sheets.

Validation has been assured in several ways throughout the study (Cilesiz, 2011; Creswell, 2007; Moustakas 1994). In phenomenological research, a high level of objectivity needs to be present on the part of the researcher to produce knowledge that is valuable. Therefore I, the researcher, engaged in the reflective epoché process in Appendix A, and disclosed my subjectivity statement to enable readers to understand the researcher's context and how it will affect interpretation of the data. In addition, I used the bracketing process throughout the data analysis to set aside my own ideas and previous experiences with the phenomenon to be able to maintain my subjectivity.

A second measure of validity utilized was that of member checks (Creswell, 2007). The third interview employed member checking to give feedback on the textural synthesis, and checked the accuracy of the findings thus validating the data and making sure the participants' voices are heard rather than that of the researcher.

A third measure of validity was utilized through transparency in the research process. Detailed accounts of decisions concerning participant selection, data collection, and data analysis are provided. Information about individual participants, and the complete textural and structural descriptions of each participant's descriptions are included in the final report in Appendix H through N, thus adding to the transparency of the study, and allowing readers to more closely evaluate the findings. Limitations of the study are reported.

A fourth measure of validity that of reciprocity with the participants was achieved by sharing final results with the participants and the school district upon request, as well as offering further training or assistance with other Web 2.0 tools in return for their time and effort at the conclusion of the study.

Formats for Presenting Results

Various forms of data have been collected during this study. Detailed accounts of decisions concerning participant selection, data collection, and data analysis have been shared in this final report in Chapter Four. The recordings and original interview results, along with the raw data of transcripts from the interviews have been stored on a USB drive and will be saved for three years after the conclusion of this study. They are available upon request. In addition, the coding files from the horizontalization of data are stored on the same disk, although a sample of the codes can be found in Appendices N and O. A table listing the density of the families or themes of the codes from each participant can be seen in Table 2 on page 69 in this final report.

The textural and structural descriptions for each participant were used to present the narrative results and have been placed in Appendices H through L, with the exception of two, which have been placed in the final report starting on page 69. The two in the report were placed in the results section to give an example of the rich descriptions resulting from the horizontalization of data and imaginative variation to describe the experiences of the two participants. The composite textural description and composite structural description, giving the combined description of all participants have been placed in Appendix M. The textural-structural synthesis was shared with participants during the third interview for feedback and a copy of the edited version is also found in Appendix M.

The final report will be shared with the dissertation committee, as well as the Supervisor of Accountability at the school district. Results will also be added to the online blog at the TPACK website in order to add to the existing research base.

Summary

A rigorous phenomenological approach as suggested by Cilesiz (2011) was used during this study. Methods of inquiry included phenomenological reflection on data elicited from seven teachers who adapted their pedagogy to use the tools in their classroom. The researcher engaged in epoché, or reflection, and created a subjectivity statement to refrain from judgment. The participants participated in two taped interviews at one week intervals during the school year. The interviews were transcribed verbatim and phenomenological reduction using “in-vivo” coding was employed to look for meaning units across participants (Creswell, 2007; Saldana, 2009). Imaginative variation was utilized to combine interpretations to create a textural and structural description for each participant (Moustakas, 1994). The descriptions for all participants were then combined to create a composite textural description and a composite structural description giving the experience of all the participants. The combination of the two composite descriptions resulted in the textural-structural synthesis giving the “essence” of the experience for all participants. This synthesis was shared with all participants and edited to reflect their feedback. Conclusions, implications and recommendations were drawn from the synthesis and shared in this final report.

Resources

The resources needed for this study were minimal but included the following:

1. Access to the Internet and Web 2.0 tools to be able to understand which tools the teachers were utilizing.

2. A voice recorder and corresponding data files were necessary for recording the interviews and later transcribing the data.
3. Access to communication tools such as email for originally contacting participants, and later telephone access for setting up dates for the interviews.
4. Access to software, such as Atlas.ti, for analyzing textual meaning units during the data analysis part of the research.

Chapter 4

Results

Results

The phenomenon investigated in this study was how and why teachers struggle to adapt their pedagogy for effective use of Web 2.0 tools in the classroom. Phenomenology was utilized to examine the teachers' voices about their lived experiences. The definition of adapting pedagogy for effective use of Web 2.0 tools in the classroom was not imposed on the participants, but was derived from the data gathered through the teachers' voices. The researcher used the components of TPACK as a framework for discussing the teachers' experiences, giving credence to the research that TPACK can be used to identify common elements in the essence of adapting pedagogy for effective use of Web 2.0 tools in the classroom.

Data Analysis

Data analysis included horizontalization of the data, or coding the transcripts of the 16 interviews resulting in 116 codes or meaning units. The meaning units for each participant's first two interviews were merged and the textural and structural descriptions describing their experiences were written using imaginative variation (Moustakas, 1994). This resulted in 17 narratives: textural and structural descriptions for each of the seven participants, a composite textural description, a composite structural description, and a textural-structural synthesis of the experience of using Web 2.0 tools in the secondary

classroom. For more complete descriptions of each of these components, see the Data Analysis section of Chapter Three.

Horizontalization of the Data

The transcripts of the 14 interviews were entered into Atlas.ti, software for analyzing qualitative data, as primary documents. The transcripts were renamed to utilize the pseudonyms for each participant to protect privacy. Coding was done by examining individual statements in each transcript, resulting in 116 different codes with the accompanying quotations. Codes were identified by Saldana (2009, p. 3) as a “word or short phrase that symbolically assigns a summative, salient, essence-capturing” attribute for visual data. In-vivo coding (Creswell, 2007; Saldana, 2009) was done to utilize words drawn from the participants to keep as close to the essence of the experience as possible. Creswell (2007) advised the use of phenomenological reduction or treating each statement with equal worth and aiming for eliminating overlapping codes or meaning units, then taking significant statements and creating themes of common codes.

The individual codes were then examined and sorted for common threads, or families. In the Atlas.ti software, themes are called families. A total of eleven families were identified. Table 2 shows the number of meaning units per participant indicating the density of the theme. These threads were identified as Pedagogical Knowledge, Content Knowledge, and Technological Knowledge, challenges, changes in learning, changes in teaching, decisions about materials, success, supports, training, and Web 2.0 tools. Quotations, or text from the transcribed interviews, were then pulled for each of

the codes and read by the researcher to get a sense of the essence of that particular code.

A sample document for the “adapting of pedagogy” code can be found in Appendix O.

	Debby	Janece	Joanne	Lisa	Nancy	Renee	Teresa	TOTALS:
Pedagogical Knowledge	13	15	14	9	14	13	12	90
Web 2.0 tools	7	16	12	8	17	13	6	79
Decisions about materials	12	8	11	8	13	10	12	74
Changes in learning	6	9	9	4	10	8	7	53
Technology Knowledge	7	5	5	12	12	2	9	52
Training	7	6	3	10	11	4	8	49
Changes in teaching	8	9	6	5	9	6	5	48
Challenges	4	4	8	5	11	8	5	45
Content Knowledge	6	4	3	5	6	7	5	36
Supports	3	3	2	4	4	2	6	24
Success	2	2	2	3	2	2	2	15
TOTALS:	75	81	75	73	109	75	77	565

Table 2: Meaning Units per each participant showing density of each

Textual and Structural Descriptions

The quotations for the codes in the first and second interview of each participant were filtered and blended into one document. A sample of this type of document is in Appendix N for demonstration. Imaginative variation was used on these codes to write the textural and structural descriptions for that participant. Most of the code families were used in the textural descriptions to explain “what” happened with each participant, but the PK, CK, and TK families of codes seemed to fit better in the structural description to explain the “how” for each participant. Two textural and structural descriptions are included here to show the rich experiences gathered from the participants. The remaining five textural and five structural descriptions can be found in Appendix H through Appendix M.

Textural Description of Renee's Experiences

My training with technology was primarily self- taught with simple things like LCDs and programs. It's been just a gradual self-process and it makes it easier for kids to read and see and for me to teach. As my skills have improved, I've gotten a better record of what I've done with projects than I used to have by using just the chalkboard. I can modify lessons more easily and have more documents for differentiation for advanced or lower classes.

My training with Web 2.0 was also self- taught [and came about because] I was teaching an online course that required the participants to use the tools, so that gave me the incentive to learn them ahead of the teachers who were my students. I spent time sitting and signing up for them, playing around with them, thinking about how I can use them in my own classroom.

I wanted to enhance differentiation of content with both Animoto and Voki. They are not designed for instruction. I use the free 30 second version of Animoto, which makes the students use the slots for pictures and texts. What they have to do is create a movie about a book or an entire scene to tell the author's purpose or lesson. They usually choose images that represent key characters, and then create text that represents the main idea, then create a statement that reveals the lesson of the author. They've done some beautiful presentations with Animoto.

Voki has helped them get to the big idea of a story. The students create an avatar of a character by choosing images that represent the key characters. They then choose key dialog for their avatar that represents the main idea, and a statement that reveals the lesson of the author. They choose a background that represents the mood of the setting. When they add the dialog they also choose the voice tone and quality of the character. In other words, they bring to life the characters and setting. They keep it a secret as they create it, then when they put it up on the screen in front of the class, they lead a discussion about the character which includes questions like who is this character and what is significant about this scene. The students are very bumpy and rocky in their instruction but they are definitely learning the big ideas about the characters, themes, etc. of the story.

My typical lesson starts with the students writing five lines in 5 minutes, giving students experience writing every day. The class then reviews the objective, which can look formal or informal. Then typically there is a read aloud with all reading together and we dive back into the book analyzing a passage. The students have some interactive activity involving talking and working together to create or solve a problem or do something related to the book. This could be an art activity, could be a character slogan or theme song or make a bumper sticker. I create learning packets. The learning packets have some activities that are standard and include the three types of writing, a response to a book, a persuasive piece, a personal narrative or an original story. The students do not have a choice about doing the standard activities. After they've completed the standard activity, they have a working folder in the classroom which includes activities from the reading or writing process, such as fluency cards or portfolio challenges, then they have writing choices they can do once they are done those. The "first and fabulous" students (those with work completed first and correctly), are the first on the list to work on the computers on the avatars, Animoto, Toondo, or a poster. They work together, and if they

don't work well together they lose the chance to work with the technology. Since they are so motivated to do it, completion is not an issue. I'm checking to see if they are listening and collaborating. While using the headphones they are listening to dialog or music that's a secret. They love getting up and being the guest teacher to showcase their creation. It's nice to get them involved that way and they have content to present and share in a way that makes them proud and builds self-esteem.

Although I have been successful in using Web 2.0 tools because they are intuitive and easy to use, I've also had some challenges. Right now, one of the challenges involves keeping track of all the registrations and passwords for the tools, and how to get into the tools, and on which computer I did the registering. I've got a simple system for now, but not sure how long that will work.

Another challenge is that I have some questions about the tools. For example, I've set up a wiki but things like linking to other wikis, what are the policies of the system on the wiki? And how do I get the students involved in being in another wiki? In the course it suggested to create wikis, but then how to invite others into the wiki? I've built a wiki for next year's kids which had examples of student work, comments, and even has little lesson guides and links to my Web 2.0 tools. However, how's this different than what's on Edline and is it any better? Why would I choose a wiki over Edline? I would like to be able to make it so a wiki has multiple audiences so they can access each other. I would like to use it for my Department to have one to get on, with just department people with no interaction with students and teachers together. This means that access should be limited to separate wikis. I don't have a good understanding of a great wiki. I know that you can, but I'm not sure what a great use for a wiki is. Content is being built in the wiki but I would have to try the enhancements to make it look nicer, like in the Glogster widgets, but then the wizard doesn't show up and some of the pictures disappear. I've put those [wikis] into the category of what I'd like to learn next.

The biggest barrier for using the Web 2.0 tools is the limited computers. I can't do a whole group lesson where the students all are creating a project at the same time. This requires me to have tools at the stations and have other stations and other options for those not on the computer. Oddly, struggling kids are using the computer most because the class is smaller and they have more time with me, and a greater chance to get on the computer. My instructional challenge is to have to balance structure and choices. The lower kids need the structure and the flexibility. In short it takes a lot of thinking and planning to accomplish those goals.

I thought that I was behind in learning the tools because there was no support from the county, but when I started asking around, I found that it was still a new thing in the district. When I mention the tools to other teachers in meetings, the teachers get overwhelmed, so I just keep in mind my goal and the essential understanding and use the tools to help kids get to that essential understanding.

Despite the challenges, I really like the Web 2.0 tools as they are great for building awareness in their brain for the major content. There is no magic tool to make them but the tools are great for expanding their brains and thinking deeply, and representing their ideas in new and interesting ways. And as far as teaching work force skills for a job in the future, the students need to be able to write clearly and speak clearly. It is the old way vs. the new tools. I haven't accessed all of the tools, like some of

the tools that allow kids to write and collaborate together in the same cyberspace. Other tools could get them thinking mathematically for surveying the class, learning to find the perceptions and understanding of things. Some tools like mindmeister, where they brainstorm together and create a mindmeister map, and other tools that were wide open and some were taking very specific skills, there are so many options.

I love the 6th grade year, because of that leap because they have the fundamentals down, and leap to books to teach us how to live. So I always try to make discussions, ideas and activities relate to the big idea. Web 2.0 tools can be used to help kids get to the big ideas and represent it to an audience and make it real. The technology, the simpler tools, using media, song, and images to represent big ideas help the students make that big leap that should happen that has to do with why we read and why we write and how it makes it distinctly human.

Structural Description of Renee's Experiences

Renee's technological knowledge was reached primarily through teaching herself. She started with using the LCD and basic computer programs. She learned how to use Power Point and the document camera to share with her students gradually through her own explorations. She found that it made it easier for her to teach and her kids to learn, however, she found herself doing more presenting than having the kids interacting.

Renee's interest in Web 2.0 tools came about because of a course she was teaching to teachers called Universal Design for Learning and Next Generation Learners. The course was based on modules teaching multiple intelligences and focused on how the brain works. Each module suggested Web 2.0 tools to use to meet the concepts of Universal Design. She put in the effort to learn the tools so that she could model lesson activities for the teachers in her class. In addition, she created tutorials to make using the tools easier for her teachers and students. The need to use the tools to teach teachers about them initiated Renee's interest in them, but the tools answered a need for her in her own classroom as well.

She described one of her previous pedagogical challenges as not having a whiteboard and missing the interactive benefits that comes with it. She used the LCD screen for presentation and instruction, but felt the involvement level for her students could be improved. Her basic pedagogy involved using many different learning activities including directed activities such as a read aloud and interpreting what they had learned. Other main learning activities centered on using stations for teaching writing and included activities for differentiating instruction for challenged and gifted learners. When she found the Web 2.0 tools, she felt that even though she was limited to two computers in the classroom, she had a way for the kids to get involved. She felt their learning improved when they actually interacted with the computer.

Renee's extensive background in her content helped to guide her choices of Web 2.0 tools. She had always loved to read and write as a kid, and took that love to undergraduate school as an English major. She didn't get into education until she took a one year course of study in teaching (MAT) where she learned that she loved working with kids. The program helped her convert the English degree to teaching. Her experience with the content continued to be developed when she went back for a Master's degree in writing. This degree gave her a background in the history of prose and rhetoric.

Her interests still include constantly reading about writing and literature. In addition, through further professional development, she became a Master Teacher for the state department on teacher effectiveness and the new Common Core Standards developed last year. The curriculum guide she was given for teaching a course on teacher effectiveness and the Common Core standards, gave her suggestions for using the Web 2.0 tools. She took the initiative to learn the tools on her own time in order to give good examples to her teachers.

Her independent exploration of the Web 2.0 tools has given Renee many successes but has also included some challenges. Her experiences with teaching the course for the state exposed her to the Web 2.0 tools at a time when the district had just opened the tools for use in the classroom. Previously, those tools had been locked out, and teachers were forbidden to use them. The recent lift of that ban created the possibility for Renee to explore their use, but she did not receive support from the administration at the district level. Professional development in the form of an online course and some individual workshops were being offered but were not widely publicized. When she asks other teachers or administrators about the tools and gets the feeling that the teachers are “overwhelmed” and that the tools are new in the district, it reassures her that she is not behind in technology as she had thought, but also makes her realize that she doesn’t have any guidelines as to district policies on the tools. A prime example of this is her questions about wikis and their use for more advanced collaboration between other classes and with her department.

Renee’s strong content knowledge and pedagogies utilized before exploring Web 2.0 tools, supported and strengthened her experiences of adapting her pedagogy to utilize the tools. Her experience in the classroom utilizing the tools with students have largely been successful in that she sees her students using higher level thinking as they produce projects that make stories come to life in their minds. Seeing her students successes with the tools, has reaffirmed her belief in them and made her more willing to keep exploring and learning the tools on her own. In addition, she would like to be able to share her knowledge with more of her colleagues and will probably do so as she continues to teach the course for the State Department of Education as a Master Teacher.

Textural Description of Janece’s Experiences

My first computer experiences occurred in undergraduate school where we used laptops and learned the basic programs like office software, Google docs, applications, and other technology tools. We created portfolios and shared projects with the laptops in classes. When I first started using technology in the classroom I mainly utilized Power Point for presentations on music in different countries, and composers from other eras.

My training in Web 2.0 tools occurred at county offered in-service workshops. These sessions were two hours long and we were paid a small stipend for attending. I’ve taken about 15 - 20 of the tech courses in the last year. I learned Voki and Edmodo during those sessions. The structure of the workshop is helpful. The presenters talk about it then model it, and you have time to do something you can use. Most of the things I use now are what I created in the workshops, and was able to apply it a couple of days after it. The tools helped my instruction and the students enjoyed it well enough for me to keep it going.

My typical lesson consists of students completing a drill that involves reading music notes for pitch. They play recorders and I'm looking for rhythm and pitch. When I'm entering a new unit I use a mini-lecture with PowerPoint, or Story Bird for giving the history then they go to stations on a computer. However, Power Point got fact based and heavy. It was more about just about history and not the music itself. It only reached one or two kinds of students, the ones who like to read or present, not the ones who liked to hear and create music. So I used a better program used Photo Story so they could listen to it, analyze it and also create with it. They are using higher level thinking skills when they can create their own music. It lets me understand that they get the key concepts and have the understanding of the basic concepts of tempo, tone, genre, and style.

In the beginning of my lessons, I sometimes use Story Bird to introduce a song from a culture so that I can talk less and the students are able to form ideas about the music before they listen to it. For example, in 6th grade, when I introduce the music of Japan which is based on nature, I found a lot of pictures based on nature, and then ask them what the songs will be about. You can see people walking on the beach and I use it so they can focus on the story and pictures. You don't have to say this song is about nature. They pick up on it and articulate. They form their own ideas when going into the music. It is a pretty way with art work to combine music and art and shows me another layer of their musicianship. That way I don't have to say it because they see it without you saying it.

The stations can involve listening to or writing music or playing music games. When they are at their stations, they rarely write music, they are listening, they play music notation games, or they listen to music in different places, history or time periods. I differentiate for band students and lower students by giving different lessons to each group. While not on the computer, students rotate and play instruments, do book work, or use Power Points created by my colleague. These Power Points are interactive ones which they can go through on their own, with pictures to click on to learn about a topic. Struggling students do the power points first. For closure, their responses to a question are sometimes written, and sometimes posted on Wallwisher. It's just something they have to get done throughout the period, and then we share the results at the end of class. It's a very quick paced. If they don't do what they are supposed to do, they get behind and I won't help them again with what they missed.

One of the Web 2.0 tools I use is Edmodo which is a great tool for gauging opinions on things we've covered in the unit. It has a poll feature which can be used to ask questions such as what do you think about terms of the times, for example, their opinions on chants. Students can post photo stories they've created for other students to critique. I use Wallwisher for closure as well as for a variety of exercises. If working on a project, say on composers, they post which composer they choose and why, or give an interesting fact. The tool lets them brainstorm on a wider scale. With 6th graders working on countries they do the same thing. It gives them a way to get to know each other in a different way and why they are interested. I use Blabberize to make them talk. Another tool, I have used is Voki with students in the after school program. They had to create a character and a script for their character from the books, and discuss how characters see themselves and other characters see them. They were asked to tell what clues are in the text that told them that about the character.

I also create quizzes in Edmodo. Next year the mentor teacher will collect data on paper tests versus online in Edmodo. The kids seem less stressed when they take it online, I'm not sure if it's because it is what they are used to or that they take it when the class is noisy (at center time rather than just in a quiet test taking atmosphere). The only issue is with the listening portion; sometimes they can't get a You Tube video on their computers because codecs aren't on there. However, this helps me with the documentation of their listening skills.

Sometimes I use Wordle for musical analysis involving all the kids in the rotation. They listen to the song and students input 10 words into a list in a running Word document during stations. The words are categorized by the 5 elements of mood, tempo, dynamic, tone, and meter. Then I put the words gathered from all the students in that rotation into Wordle. We see that chants come out with the word "boring" listed 20 times and Wordle shows the words used the most in large print. During closure we talk about why some words came out as important. We can talk about the word "boring", but why is it boring? To whom? Is it boring to the composer or to you as the audience?

Kids use Photo Story for the create music feature, as it allows me to assess if they have grasped the 5 elements of mood, tempo, dynamic, tone, and meter even though they are not listed that way in Photo Story. Creating music that is reminiscent of what they have been using. With Power Point they wanted to write paragraphs or copy and paste, rather than using lots of text, it allows students use pictures to understand bigger ideas. Students have been able to talk with interest and knowledge about their subject. Using the technology is helpful to them and me. I can assess that they are using musical terms and terminology to analyze music and take information and apply it to something different based on what we had been learning. I get to see what they know even if they don't complete the whole project. It helps the struggling readers because they have to summarize their points in a concise manner.

I use Wallwisher because it is a quick way to get brainstorming done without pieces of paper floating around the classroom. They can access it when they are not in the room. It also lets them see what fellow students in other classes are thinking. I pose questions to one class and the other can see it. That way they can get more ideas. The same with Edmodo. I have different classes of the same grade on the same Edmodo group. It excites them to be able to dialog with others they don't see. I use the polls as an incentive when they get other things done.

To decide what materials or tools to use, I just kept using all kinds, and saw what stuck. If I was exposed to it, and if I had time to experiment with it, I'd try it in the classroom. Some things didn't work as well as others, maybe for that type of student or lesson. For example, I don't use Voki in my general music class when I teach about composers. It's not a good use of the tool as it makes them funny looking, and not relevant to the content. In 6th grade world music, I don't want to put up a Chinese person to say this is the Chinese perspective. I use Voki for the after school program, not in general music classes.

Most people wouldn't even say this technology is for my content area, especially with Web 2.0 tools but I was thinking it's important to have good presentation skills. If they can play it they should have skills, and are able to talk about it and write about it. I use other technology tools that are more tools focused on my content, like Smart Music which has accompaniment and cameras for self and peer evaluations.

The reason I use the Web 2.0 tools is that I try intentionally to talk less and ask more questions. The Web 2.0 tools allow me to do that. The way I use the tools, in every case a question is posted, either on Wallwisher or a poll. It's a question, or an assignment or discussions on Edmodo, or in my Story Bird presentation, I ask them questions. It's helped me ask better questions and I work toward asking the students better questions.

I feel all my classroom activities are successful. Things that don't work, I don't use. It's trial and error. Things that work I keep and adapt for different groups. There have been some that work with one group and not another but the tools lend the flexibility to meet the individual needs of students and are catered to the students in the class. For example, with the Voki, what is available for use doesn't fit my classroom. Another site, like avatars, all the avatars are white, and I won't bring that into the class because I want them to feel valued. I also feel that it's more efficient sometimes because I can use less time talking and letting them explore more. Transitions are aided by some of the tools. We don't have to stop for a written closure, we just go onto Wallwisher and Wordle at the end of the class, and pull it all together.

One of the challenges I've encountered is the lack of accessibility to certain types of files. The children can't get to it on their computers, because we use mp3 files and their computers won't play them. Also, some tools are inappropriate. We used FreePlayMusic.com, but it doesn't have the styles they are required to research and they are not allowed to download music. We don't have software to clip music pieces they find to the legal limit of what they can use. I also had to learn how to have them do citations for websites. The Integration Specialist helped with that.

Another challenge that's made it more difficult is the number of computers. Logistically, I have to teach them how to use them ahead of time because of the space and access issues. And the technical challenges with the computers in the classroom. I couldn't use Smart music or Music Ace, a games based program for learning music, with the students because you need microphones with USB ports. If they could speak into the computers on headphones with mics it would be nice. Also having a whiteboard would be nice.

Sometimes, the speed of the internet is a challenge at times. With Wallwisher it wouldn't load at all or too slowly, but that's been better lately. The access to Web 2.0 has been fine except for finding music pieces; they have to go to Amazon.com to listen a sample. It would be nice to have more computers. If I could get the mobile lab, it would take more time than I have.

I have gotten support from the several colleagues with some of these issues. The Integration Specialist has created some how to sheets for the basic software, giving very detailed instructions on the tools. These let me spend time on content, and make the students responsible for learning and working their way through the technology with those instructions. My department chair has given me ideas, and shared the interactive Power Points I mentioned above. The teacher mentor has also helped me think through some of these ideas, and is willing to gather data for us to see which quizzing method is the most effective.

I'd like to lean more toward technology, especially with 6th grade not only because it has an organic approach, but because that's how music is created today, with technology. That's why I like to incorporate more technology tools. To make this all work, I'm constantly reevaluating and changing.

Structural Description of Janece's Experiences

Janece is a young second year teacher whose technology knowledge was formed in the formal undergraduate classroom with the benefit of having to use the technology as part of classwork. She received a good grasp of basic software, and the confidence to try new technologies. Her knowledge has been expanded by attending the county designed workshops on Web 2.0 tools. These workshops are offered after school, and pay teachers a minimal stipend for attending. The format of the workshop is that they last two hours, with the first hour spent on the instructors demonstrating the tools and ways to apply them in the classroom. The instructors are classroom teachers at varying grade levels and subject areas and give examples to which all participants may be able to relate. The last hour is provided for the participants to work on something for their classroom, while they have experienced teachers there to help them with any glitches or to answer questions as they work.

Janece's content knowledge is strong in that she has familial roots in the field. She feels that everyone is interested in music, and her interest began when her grandparents sang opera. She sang in church choirs and got an undergraduate degree in music. When she went to get a master's degree she got it in music education. She found she liked education more than music. She feels her knowledge in music is deep, however, since it is the oldest discipline in the history of the world, there is so much to know about it. She feels that if you compare her to a Jazz musician or to someone specializing in early music, then her knowledge is just scratching the surface. There is so much to know that no one can have a deep knowledge except maybe in one particular area.

Since Janece has only completed her second full year of teaching, her pedagogical knowledge is still developing as evident from her trial and error examples. She uses a variety of methodologies that focus on music theories, notation and reading music. She mentioned that she mainly uses the Orff - Schulwerk methodology that combines movement with poetry in the creation of music especially in studying world music because it has a more organic approach in creating music.

Her classroom has several areas where students are active and engaged. Musical instruments such as fluto-phones, drums and other instruments are arranged in the room. In addition, she has a mini lab with 5 computers in the classroom equipped with headphones without microphones, and access to the internet. She uses these computers as stations for most of the activities mentioned. She also has a teacher presentation station, but not an interactive whiteboard. She gave some very rich examples of the potential for uses of Web 2.0 tools in the music classroom. From the variety of tools she uses to the types of activities she creates, and the way she ties them all together with closure activities, it is evident that her pedagogy focuses on finding the best way to involve her students and meet the needs of 21st century learners.

Her student roster includes teaching 6th, 7th, and 8th graders in a rotation format. She sees groups of 20-30 students for seven weeks at a time, and then rotates through the rest of the students, eventually seeing all the students in the school by the end of the year. During each rotation, she teaches two classes of each grade level. The classes are divided so that the performing arts students meet in the afternoon classes, and non-performing

arts students are in the morning classes. Therefore, with students interacting online, the morning students get to interact with the afternoon students who are stronger in their musical abilities and each class can learn from each other. In addition, when she opens the discussions up to the entire rotation, students can interact with students in other grade levels, thus expanding their knowledge even further.

Even though her pedagogical knowledge is still developing, the fact that she teaches two of each grade level during a rotation, gives her a chance to fine tune activities in the afternoon class that may have had challenges previously. In addition, the fact that she will teach the content four more times during the year to the different rotations, gives her a solid field from which to hone her pedagogy.

Her confidence in applying the technology and exploring new tools is a testament to the fact that having exposure to technology in undergraduate classes can impact the classroom. She took her initial experiences from undergraduate school, and put in the effort to take advantage of the county offered workshops to create things for her classroom that are relevant and up to date.

The support she's received from other colleagues, such as the integration specialist, mentor teacher, and department chair have given her the support to be able to focus on her content and adapt the pedagogies for the best uses of the tools. Each of these support persons has impacted her professional growth from one leg of the TPACK framework. The mentor teacher has supported her with helping her with the pedagogy part of the equation, while the department chair has given support for her content knowledge, and the integration specialist has provided support by giving help sheets for the students to utilize with the tools, thus supporting her technology knowledge.

Findings

The main goal of the research was to examine what process teachers use to change their pedagogy to deliver effective instruction using Web 2.0 tools. In particular, what decisions were made to adapt the lessons and activities, and the reasons behind those decisions were examined. The textural and structural descriptions of each participant gave a rich description of the teachers' "lived" experiences, and the composite textural and structural descriptions identified the "essence" of the group experience, thus meeting the goal of this research.

The essence of the experience of the phenomenon centered on interrelated themes which lead to the answers to the original research questions posed at the beginning of the study. In addition, the purpose of this research was to understand how teachers work

through the TPACK framework as they learn new Web 2.0 tools and adapt them for use with secondary students. The TPACK components (TCK, TPK, and CPK) are indicated in the following summary showing both the teachers' decisions about pedagogy and how their TPACK supported those decisions. The textural-structural synthesis from which these findings have been derived can be found in Appendix M along with the Composite Textural Description and Composite Structural Description.

Findings Showing TPACK Components

The research questions posed at the beginning of the study are listed here with the findings from the teachers' voices that describe their experiences.

1. What Web 2.0 tools were used in the classroom by teachers and students? How were these tools being utilized? Why were they being used?

Based on data gathered from teachers' voices, this phenomenological study has indicated that Web 2.0 tools such as Animoto, Voki, Diigo, Wiki, Voice Thread, Cartoon Maker, Prezi, Edmodo, Podcasting, Wordle, Wallwisher, iEARN, and Edline discussion boards are being utilized in secondary classrooms in the school district being studied. Most of the tools are being utilized by both the teachers and students. Tools like Prezi, Wiki, and Podcasting are being utilized by teachers to help present materials to students in different ways. Other tools mentioned above are being used by teachers and students for a variety of learning experiences. Animoto and Voki are making stories come to life in a language arts classroom, while Cartoon Maker and Voice Thread are being used by computer education students to demonstrate what they know about cyber safety. Diigo is being used by students to keep track of websites they visit, while Wordle is helping music students share musical elements across grade levels and different units. Other classes use Wordle to work on vocabulary development. Tools like Edmodo, Edline Discussion boards, and iEARN were utilized for organizing student work, lesson plans, grades, and communicating during online projects, as well as for brainstorming ideas.

The reasons why teachers use the tools centers around student learning. An example is creating an Animoto character to "...bring characters to life is a different way

to express ideas in literature (Debby)” which makes students think in a deeper way about what they’ve learned (PCK). Another teacher improved teaching by “...being able to present concepts to students by showing a lot of pictures based on nature, and then ask them what the songs will be about. They see it without you saying it. I use it so that I can talk less and the students are able to form ideas about the music before they listen to it (Janece).” Another example of changing learning is that the tools can differentiate instruction for different types of learners. As one teacher stated “... what web 2.0 tools does for kids is it allows them to bring books to life, better than paper and pencil, and gives them a way to be artistic even if they are not artistic (Renee)” and “... rather than using lots of text, it allows students to use pictures to understand bigger ideas. They have been able to talk with interest and knowledge about their subject. It helps the struggling readers (Janece) (PCK).” Another evidence of teaching and learning changing, as expressed by several teachers, is the concept of hearing from all students in the class. As one teacher put it, “... all the kids had to respond...so I think it was better than being in the classroom where you only call on a few students (Debby).” One teacher summarized, with Web 2.0 pedagogy can change “...from teacher centered to a facilitator as a guide on the side, to lead students in the right direction. They are more engaged in finding their own information, and when sometimes they find the wrong information, you have to step back and guide them to other websites or to what other kids are blogging, and guiding them to rethinking their thinking (Teresa).” (TPK)

2. What are teachers’ opinions regarding the technological factors, such as access to web sites, computers, or speed of the internet, which either supported or

hampered their use of Web 2.0 tools (Levin & Wadmany, 2008; Koehler, Mishra, & Yahya, 2006)?

Teachers' opinions regarding the technological factors, such as access to web sites, computers, or speed of the internet, which either supported or hampered their use of Web 2.0 tools (Levin & Wadmany, 2008; Koehler, Mishra, & Yahya, 2006) were that they needed to do whatever was needed to overcome the technological challenges, and use whatever supports they could. One of the biggest challenges mentioned by teachers was getting access to computers whether in the lab or in the classroom. The labs were frequently being used for statewide testing, thus limiting access. Even the two computer education teachers who taught in the lab, had challenges because testing couldn't be done on laptops and their labs were needed for the tests, so they had to rearrange their classrooms to accommodate the testing. Teachers who had one, two, or as many as five computers in the classroom, had to do extensive re-thinking of their classroom activities to include groups or stations so all students could have access to the computers. Speed of the internet was listed as a challenge, but most participants agreed that the speed was better than it had been previously, and now the speed depended on the time of day. Access to websites or the Web 2.0 tools due to filters on the system was another challenge, but teachers admitted that it has improved lately as well.

Technology skills (TK) were obtained by the participants either in formal training classes, self-training, or "hit or miss" on the job training. Extensive additional personal time was spent by the participants researching, exploring or "playing" with and learning both basic technology and the Web 2.0 tools. The additional time spent learning or

exploring helped the participants overcome some of the technological challenges that came with adapting something new.

Teachers utilized many supports to overcome these challenges. First and foremost was that the teachers spent an extraordinary amount of time “playing” with the tools even if they had had formal training on them. This time allowed them to become familiar with the tools and figure out where the tools fit their curriculum. In addition, the teachers used any help files available, or would contact a colleague to help with the challenges. Sometimes that colleague was the media specialist, an integration specialist or a team mate that was more tech savvy. Occasionally technical support personnel were also involved.

3. How did a teachers’ knowledge of their content impact the decisions they made for choosing specific technological tools to teach that content (Mishra & Koehler, 2007)?

Teachers’ knowledge of their content impacted the decisions they made for choosing specific technological tools to teach that content (Mishra & Koehler, 2007). They knew what skills and essential concepts they wanted the students to learn, so were able to look for tools that helped them reach those concepts. Decisions they made included looking at the ease of use of the tools for students, as well as how well it would get to the concept they needed. Sometimes their decisions were influenced by suggestions by a supervisor, curriculum guide or a department chair that knew their content as well. Other times, their decisions to use the tools were influenced by the impact that technology had on their field, for example the music teacher wanting more technology because music is created now using technology.

All the participants felt they had strong background knowledge in their content (CK) with most having completed Master's programs. They all acknowledged that they were always learning by keeping up in their field. This content knowledge enabled them to "... know where things might fit when I teach that section" (Debby), and to understand which concepts were best taught with which tools (TCK). Sometimes tools were chosen because they made students use their background content knowledge. In addition, the tools gave the teachers a diverse set of tools to make teaching the subject more effective (PCK). Sometimes decisions on the tools were based on the ease of use of the tools for what the students needed to do with the content (TCK). Some decisions were influenced by the fact that technology itself is changing their curriculum. Some choices were based on how the tools could be used to highlight parts of the content. Examples are the use of Prezi in the science classroom to get the overall picture along with the elements, or in the social studies classroom the use of Edmodo to explore a picture, connected to an historical time period, in detail.

4. How was pedagogy adapted for using the Web 2.0 tools, particularly studying teachers' opinions on which parts of their classroom practices were successful or unsuccessful and why (Levin & Wadmany, 2008; Koehler, Mishra, & Yahya, 2006)?

Pedagogy was adapted for using the Web 2.0 tools, as per the teachers' opinions on which parts of their classroom practices are successful or unsuccessful (Levin & Wadmany, 2008; Koehler, Mishra, & Yahya, 2006). The teachers admitted that they were constantly changing their lessons to improve them. Even improving lessons from the morning class to the afternoon class took place on a regular basis. In addition, teachers

would adapt the same lessons for different groups of students depending on their abilities. They felt the tools made it easier to adapt things quickly and share with their students. Therefore, teachers were always improving their practice, which made them feel that they were successful.

Pedagogical knowledge (PK) varied among the participants. One participant was a second year teacher with her pedagogy still in the process of being developed, however, she had support from the mentor teacher, her department chair, and the integration specialist that aided her in developing and fine tuning the pedagogy. Another participant was a researcher before a teacher, so was not as aware of pedagogy and what it was. However, her content knowledge was so strong that she instinctively seemed to do what her students needed to grasp her content without being able to identify it as pedagogy. The remainder of the participants had been teaching a number of years, and had fine-tuned their pedagogies before interacting with the Web 2.0 tools. Strong pedagogical knowledge is knowing how teaching and learning can change, and if that change is beneficial (PK).

An example is creating an Animoto character to "...bring characters to life is a different way to express ideas in literature (Debby)" which makes students think in a deeper way about what they've learned (PCK). Another teacher improved teaching by "...being able to present concepts to students by showing a lot of pictures based on nature, and then ask them what the songs will be about. They see it without you saying it. I use it so that I can talk less and the students are able to form ideas about the music before they listen to it (Janece)." Another example of changing learning is that the tools can differentiate instruction for different types of learners. As one teacher stated "...

what web 2.0 tools does for kids is it allows them to bring books to life, better than paper and pencil, and gives them a way to be artistic even if they are not artistic (Renee)” and “... rather than using lots of text, it allows students to use pictures to understand bigger ideas. They have been able to talk with interest and knowledge about their subject. It helps the struggling readers (Janece) (PCK).” Another evidence of teaching and learning changing, as expressed by several teachers, is the concept of hearing from all students in the class. As one put it, “... all the kids had to respond...so I think it was better than being in the classroom where you only call on a few students (Debby).” One teacher summarized, with Web 2.0 pedagogy can change “...from teacher centered to a facilitator as a guide on the side, to lead students in the right direction. They are more engaged in finding their own information, and when sometimes they find the wrong information, you have to step back and guide them to other websites or to what other kids are blogging, and guiding them to rethinking their thinking (Teresa).” (TPK)

5. What activities with the Web 2.0 tools did teachers feel were easily adapted to teach their content (King, 2002; Mishra, & Koehler, 2007)? How did they learn about those activities?

Activities with the Web 2.0 tools that teachers felt were easily adapted to teach their content (King, 2002; Mishra, & Koehler, 2007) were ones that lent themselves to achieving a goal of their curriculum. A prime example was the science teacher’s description of using the internet and discussion boards for the geology unit rather than the weather unit because the materials available online for weather were more difficult for the students to understand. The teacher felt the students would stumble with that content, so tweaked other lessons to fit it instead (PCK). Another example is the social studies

teacher encouraging the students to look at a different part of an historical document as she watched their online discussion and saw their thinking.

Teachers learned about the activities via curriculum guides, professional development activities, or sharing with colleagues. Colleagues consulted could be their department chair, other teammates, the media specialist, integration specialist or mentor teacher.

6. How and why did the use of the Web 2.0 tools improve teaching or learning?

Use of the Web 2.0 tools improve teaching or learning by helping students get the “big idea” of a lesson (language arts teacher) or break a lesson down into parts (social studies teacher). In addition, the tools help the students work collaboratively. Students can also adapt their projects or express their ideas in different ways. The tools improve teaching because with the online tools it is easy to edit and revamp lessons to fit different students or change them from one class to another. Students are more engaged when finding their own information, leading to less stress on the teachers’ part. In addition, the tools can help teachers ask better questions leading to deeper thinking by students.

At a first look, the challenges faced by the participants seemed overwhelming, and one wonders why they bothered working through them, but the reasoning for this becomes evident when looking at the changes they feel happen in teaching and learning.

The main goal of the research was to examine what process teachers use to change their pedagogy to deliver effective instruction using Web 2.0 tools. Through using a rigorous phenomenological methodology the “lived experience” of the teachers has come to life in the textural and structural descriptions, and the “essence” of the

experience is captured in the textural-structural synthesis, therefore the goal has been reached by this research study.

Chapter 5

Conclusions, Implications, Recommendations and Summary

Conclusions

Based on the analysis of the transcripts of the teachers' interviews and the imaginative variation applied to the data to create the vivid descriptions, several conclusions can be drawn from this study. These conclusions include the information on types of Web 2.0 tools teachers use and how they are being utilized, the reasons why teachers are using the tools for instruction, and technological factors influencing their use. Last, the influence of TPACK on their success in adapting pedagogy points to the need for support in content, pedagogy, and technology training.

Based on data gathered from teachers' voices, Web 2.0 tools are being utilized in secondary classrooms by both the teachers and students, showing that the tools can be utilized to bridge the digital divide. Teachers use tools like Prezi, wikis, or podcasting to present materials to students. Students use Cartoon Maker and Voice Thread to demonstrate what they've learned about topics, or Animoto and Voki to make stories come alive. Tools like Wordle, Wallwisher, and Diigo aid in learning vocabulary and organizing concepts. In addition, tools like Edline, iEARN and Edmodo, with their discussion boards, enable students to communicate their knowledge to others and to organize their work digitally.

The reasons why teachers utilize the tools are for the advanced learning opportunities provided by the tools, for differentiating instruction or enhancing teaching. They recognized that the tools can aid challenged readers and writers to express themselves using pictures rather than words. The tools can aid the teachers in assessing students' skills in content concepts because the students can express their knowledge on a discussion board, or use drawing tools or other media to express their ideas. This functionality allows the teacher to see individual student's thinking and aid them in their misconceptions, and support them in their learning. The discussion boards also encourage deeper level thinking when students have to defend their answers to their peers. In addition, because students can utilize different modalities with the tools, the students' confidence in their skills increases. In other words, the teachers planned the use of the tools so they would aid their students in learning.

Use of the Web 2.0 tools improve teaching or learning by helping students get the "big idea" of a lesson (language arts teacher) or break a lesson down into parts (social studies teacher). In addition, the tools help the students work collaboratively. Students can also adapt their projects or express their ideas in different ways. The tools improve teaching because with the online tools it is easy to edit and revamp lessons to fit different students or change them from one class to another. Students are more engaged when finding their own information, leading to less stress on the teachers' part. In addition, the tools can help teachers ask better questions leading to deeper thinking by students.

Technical challenges included lack of access to computers, not enough outlets, sites locked by firewalls, slowness of the internet at certain times of the day, freezing computers, and software or online tools that would not work for specific tasks. A

challenge specific to Web 2.0 tools involved keeping track of “all the tools, trying to keep passwords the same, keeping a record of all my passwords, and which computers I registered which site on (Renee)”. Participants overcame these challenges either through the confidence gained from previous training and consulting help files or their colleagues such as the integration specialist in the school.

The biggest challenges mentioned by teachers was getting access to computers whether in the lab or in the classroom due to statewide testing, thus limiting access. Even the two computer education teachers, who taught in the lab, sometimes had challenges because testing couldn't be done on laptops, and their labs were needed for the tests, so they had to rearrange their classrooms to accommodate the testing. Teachers who had one, two, or as many as five computers in the classroom, had to do extensive re-thinking of their classroom activities to include groups or stations so all students could have access to the computers.

It was evident that the elements of TPACK, particularly technological knowledge, content knowledge and pedagogical knowledge, impacted many of the teachers' decisions. The impact of their technological knowledge was evident when teachers utilized many supports to overcome the challenges. First and foremost was that the teachers spent an extraordinary amount of time “playing” with the tools even if they had had formal training on them. This time allowed them to become familiar with the tools and figure out where the tools fit their curriculum. In addition, the teachers used any help files available, or would contact a colleague to help with the challenges. Sometimes that colleague was the media specialist, an integration specialist or a team mate that was more tech savvy. Occasionally technical support personnel were also involved.

Teachers' knowledge of their content impacted the decisions they made for choosing specific technological tools to teach that content (Mishra & Koehler, 2007) because they knew what skills and essential concepts they wanted the students to learn, so were able to look for tools that helped them reach those concepts. They looked at the ease of use of the tools for students, particularly at how well it would get to the concept they needed. Sometimes their decisions were influenced by suggestions by a supervisor, curriculum guide or a department chair that knew their content as well. Other times, their decisions to use the tools were influenced by the impact that technology had on their field, for example the music teacher wanting more technology because music is created now using technology.

Pedagogical knowledge was evident when using the Web 2.0 tools, when they were constantly changing their lessons to improve them either for future classes or for different groups of students depending on their abilities. They felt the tools made it easier to adapt things quickly and share with their students. Therefore, teachers were always improving their practice, which made them feel that they were successful.

These conclusions from this study for professional practice point to the need to develop and support teachers' content, pedagogical and technological knowledge for the successful use of Web 2.0 tools to adapt pedagogy. The strong technological challenges that teachers still face in utilizing these tools, can be overcome with either a strong background in content, pedagogy and technology, or by providing supports for each of those components. The challenges of getting access to computers for teachers and students needs to be overcome before more teachers will be able to adapt their pedagogy for the use of Web 2.0 tools. However, the strong changes that occur in teaching and

learning because of the use of the tools, should act as an impetus to overcome those challenges. The involvement of all students in learning, the use of deeper thinking to demonstrate their knowledge or explain their thinking to their peers, and the ability of teachers to adapt their teaching from one class to another because of the ease of use of the tools, are reasons to support more teachers using the Web 2.0 tools to bridge the divide between teachers and students.

Strengths

The strengths of the study lie in the rich descriptions given by the participants of their experiences. Of particular note is the reasoning behind their choices and the changes in learning they saw occurring. The fact that most of their choices centered around either content needs, or learning needs of their students, indicates the need to have a strong pedagogical and content background.

Using the TPACK framework to create the research questions aided in getting to the role that TPACK plays in teachers' decisions. The research therefore validated that TPACK can be used for research in educational technology. In addition, the use of a rigorous phenomenological approach validated Cilesiz' recommendations for phenomenology as a research methodology in educational technology.

Weaknesses

Weaknesses of the study lie in the small number of participants, however the nature of phenomenological research is to get in-depth knowledge from participants, so the number of participants was within the expected range of three to ten participants as suggested by Creswell (2007).

Limitations

This research focused on finding the essence of the experience of integrating Web 2.0 tools into secondary classrooms. Because the purpose of the study was to understand how teachers work through the TPACK framework as they learn new Web 2.0 tools and adapt them for use with secondary students, a relatively homogeneous group of participants were sought as a representative of the general population. Due to the recent release of Web 2.0 tools by the district Office of Technology for teachers to be able to use, a limited number of teachers that met the criteria of using the tools for at least a semester were available. In addition, the call for participants went out less than three weeks before the end of the school year which is a busy time for teachers, and therefore may have limited the number of participants willing to participate in the study. An additional study should be done at a later date after more teachers have had a chance to learn about the tools and integrate them. In addition, if offered at a different time of the school year, more participants may have come forward.

An additional participant volunteered, and even went through the interview process, but during the data analysis, it was determined that most of his Web 2.0 experience occurred at the higher education level. So to protect the internal validity of the study, this participant's data was not used. In addition, due to the timing of the study near the end of the school year, and the lack of availability of teachers during the summer, the third interviews with several teachers were conducted digitally through email correspondence. Teachers edited the textural-structural synthesis using the track changes and comment function of Microsoft Word to give their feedback as to the validity of the data interpretation.

Consistent with the phenomenological framework, which is based on individual teachers' experiences, generalization is not a concern in phenomenology (Creswell, 2007; Seidman, 1991). Therefore, generalization was not expected in this study.

Implications

Most previous research (Brown & Crawford, 2005; Levin & Wadmany, 2008; Linckels et al., 2009; Scrimshaw, 2004; Unal & Unal, 2010) had focused on giving the teachers technological skills, but fell short of teaching them how and why to adapt their pedagogy to their content knowledge in order to make the best use of the tools (Harris, Mishra, & Koehler, 2010). This research indicated that no matter what training the teachers had, they still had to spend a large additional amount of time playing with the tools to get familiar with them, in order to find the uses for them in their classroom. Therefore, professional development needs to include additional time for teachers to apply what they've learned, and time to collaborate more frequently with colleagues and support personnel such as content specialists, integration specialist or mentor teachers.

In addition, although there were common technological challenges of Internet speed, access to computers, and challenges that for each teacher were different, all were able to be worked around with the use of help files, colleague support, or technical support from the IT department. The implications for professional practice are to continue to have technical support persons available for teachers, and encourage collaboration with colleagues.

Wells' (2007) view on collaborative support, and AACTE's (2010) study of pre-service teachers' active participation in learning communities, in order to tap into the

expertise of others through coaching, mentoring, and team teaching, is supported through the teachers' voices. Williams, Foulger, and Wetzel's (2010) statement that professional development for teachers needs to provide models that not only keep them up to date with technology as it changes, but also to promote and demonstrate the transformation of pedagogy, was corroborated by all the participants, particularly the computer education teachers. Speak Up for Teachers (2011) had stated that educators were increasingly aware of the value of including digital content in their classrooms, and the participants' voices in this study validated that as well. The implications for professional practice are that professional learning communities should be encouraged to give teachers access to the latest tools, and let them share with their colleagues.

The teachers utilized their existing content knowledge and the pedagogy skills to develop activities for the classroom with the new tools, defending Harris and Hofer's (2011) findings concerning teachers choosing tools that fit the content they taught. However this study contradicted Linckels' et al. (2009) study describing teachers' actions as "fitting in" the technology rather than adapting pedagogy to effectively utilize the technology. The results gave credence to Linkels' et al. (2009) statements that the challenges causing this attitude by teachers focused around the lack of reliability of the technology itself, as well as the increase in preparation time technology needs for proper use in a lesson. The study identified that even though teachers had the challenges mentioned by Linckels et al. (2009), some of them could be overcome by the additional time the teachers spent learning the technology, as well as the supports they received from colleagues, mentors, department chairs, or an integration specialist. The supports verified Wells' (2007) belief that long term collaborative support from instructional

leaders was a key factor influencing pedagogical change. In addition, he identified other key design factors, supported by this research, such as technical and pedagogical support, and developing learner centered activities that focus on student engagement that particularly encourage the change process with teachers. Therefore, the implications for professional practice are to encourage the development of instructional leaders who can support their teachers through these changes.

Hofer and Harris (2012) did a literature search looking for how researchers were looking at each of the components of TPACK and discovered that the majority of studies of experienced teachers do not discuss TPK and TCK separately. However, in the twelve studies that did, most teachers displayed more strength in their TPK more than their TCK. Hofer and Harris wondered where the TCK was. Therefore, in the findings section of this report which was based on the textural-structural synthesis in this study, individual examples of TCK and TPK have been identified. Through their own words the teachers in this study stated that their decisions on which Web 2.0 tools were based on their content needs, but they saw results in their pedagogy with the changes in teaching and learning. This implies that more attention needs to be applied to adding the Web 2.0 tools into existing curriculums.

In examining whether the teachers' actions were "fitting in" the technology rather than adapting pedagogy to effectively utilize the technology (Linckels' et. al., 2009), the researcher discovered that the teachers met at least three of the categories of 21st century skills mentioned by the four academic institutions mentioned earlier (see Table 1, p. 29). Creativity and innovation were evident by the use of the Animoto and Voki in the language arts classroom and the after school program to make characters to come to life,

and the use of Cartoon Creator in the computer education classroom to demonstrate knowledge of digital citizenship. Communication and collaboration were used by the social studies and science teachers for students to discuss content concepts and defend their opinions in Edmodo and in the music classroom to find common musical elements in genres of music across grade levels. The use of iEARN by one science teacher also involved communication. As per the teachers' voices, critical thinking was demonstrated by the students of all the participants whether they were creating characters to make a book come alive, sharing research results in science, identifying decisions in social studies, making decisions about musical elements, or evaluating web sites via a wiki in computer education.

The activities described by the participants allowed their students to expand and apply their literacy to include hypertext and multimedia as Burkhardt et al.'s (2003) commented. In addition, the students discussed and reflected on the multiplicity of codes thrown at them (Kist, 2003) when evaluating web pages in computer science, or looked at and discussed earthquakes in science as they evaluated their sources, or discussed calling chants boring across several grade levels in music. Therefore, this group of participants demonstrated that they were doing more than "fitting in" the technology.

Teachers in this study had no challenge with giving up some aspects of their authority in the classroom, and envisioned the educational possibilities that the new literacies create as Kingsley and Unger (2008) were concerned about. This was evident by the comment made by Teresa about stepping to the side and not telling the kids they were wrong but guiding them to check out their peers' responses instead.

Talvid, Lundin and Lidstrom (2012) in their study of teachers using TPACK in a 1:1 environment stated that since the unexpected always happens in a classroom, teachers must constantly evaluate and re-design tasks. The teachers in this study mentioned constantly re-evaluating lessons, tweaking tasks and samples to make a lesson better giving credence to Talvid, Lundin and Lidstrom (2012). According to the teachers, the ease of use of Web 2.0 tools makes this process easier on teachers.

While the schools in this district are not exemplars of technology use as Daly, Pachler and Pelletier (2009) reiterated about Schrimshaw's (2004) study, this study may help in understanding how schools can make the previous transitions from level to level to become those exemplars through the examples of a few teachers. This study implies that future research should focus on the role that mentor teachers, department chairs, and integration specialists can play in assisting, not only beginning teachers, but experienced ones as well to use 21st century tools in the classroom. In addition, research should continue at the technical level to make the technical challenges lessen and guide teachers to be able to solve the challenges.

One of the most consistent challenges across the participants was that of access to computers. Several mentioned the challenges caused by not being able to get into the labs due to standardized testing, as well as remediation practices, using the lab on a frequent basis taking away access for the classroom teacher to use them for instructional purposes. Several teachers stated they wished that students had their own device and access on a regular basis. They understood the challenges with privacy and security, but yet yearned for the students to all have their own devices. So the study implies that research on how to obtain individual access and maintain and control the privacy and

security of students should be continued. In addition, research should examine how much online testing interferes with computer use for classroom teachers. Hopefully, research on 1:1 programs is examining this challenge as well.

Recommendations

Recommendations for future research resulting from this study include using the TPACK framework to plan research questions, using rigorous phenomenology for research in educational technology specifically teacher practices, and looking at the effect of demographics on teacher practice. Recommendations for professional practice include continuing the development of the mentor and integration specialist positions, allowing teachers more time for “playing” with technology, supporting teachers as they apply the tools in the classroom, administrators supporting teachers as they make changes, and allowing the teachers that have success in adapting their pedagogy to share their expertise with other teachers.

The use of the TPACK framework in this study to guide the research questions was beneficial in looking at the how and why teachers use Web 2.0 tools in the classroom. Creating the questions to look at each component of the framework, helped the researcher to look at the issue from all sides, and gave input on how the components are present for in-service teachers. It is recommended that the use of the framework be utilized in future educational technology studies to guide research. In particular, examining teachers’ TPACK in charter schools, virtual schools and online learning environments would further test this framework.

In addition, the use of rigorous phenomenology guided this research and let the teachers' voices be heard in a scientific way. It included a philosophical background, phenomenological data collection and analysis, and phenomenological description of experience. This study followed the framework proposed by Cilesiz (2011) which included writing an epoché and subjectivity statement, using three interviews with participants, horizontalization of the data, using imaginative variation to write textural and structural descriptions for each participant as well as a composite textural and structural description, and a textural-structural synthesis. The rich descriptions of the experiences gave an idea of the essential structures of the experience for each teacher as well as the essence of the experience for all the participants. It is recommended that phenomenological research methodology continue to be used as a theoretical and methodological approach to study experiences with technology, particularly teachers' experience of integrating technology in their teaching as proposed by Cilesiz (2011). Another use could be to examine the "lived experiences" of virtual teachers or students in online schools in order to understand the issues and successes in those environments.

The teachers in this school came from schools with different demographics with three teachers coming from high risk schools, two teachers coming from a more affluent school, and one coming from schools with a concentrated focus on Science, Technology, Engineering, and Math (STEM). Even though demographics were not a factor for investigation in this study, there is a good mix that indicates these results are not dependent on demographics. However, more research should be pursued on whether demographics can impact pedagogical change due to lack or abundance of the technology and other resources.

The fact that no matter what type of professional development they were given, the participants spent additional individual time learning and adapting the tools, should give those who plan professional development a heads up to include that aspect in their planning. Therefore, quantitative studies should be examining just how much time teachers really take to “play” with the tools before they integrate them successfully and how professional development can include that time.

All the teachers stated that they needed time to “play” with the tools beyond the time they had taken advantage of in formal professional development time. It is suggested that any professional development include time to learn the tools, and additional planning time to develop lessons should be given.

When they began to utilize the tools, the teachers needed support while they were adapting and changing to meet the needs of students. Therefore it is suggested that districts and administrators be aware of the fact that teachers are continuously adapting and be supportive of their efforts. Several of the teachers utilized the assistance of either a mentor teacher, integration specialist or media specialist, so it is recommended that these programs continue to be supported. With that support being crucial, not only with beginning teachers but also with experienced teachers, to overcome some technological challenges beyond any professional development, more detailed qualitative and quantitative research could explore the roles of these professionals in the use of technology in the classroom.

Last, teachers successfully adapting these tools should be encouraged to share their experiences with their peers, in order to encourage and support others. This can be

done via professional learning communities or as leaders of future professional development.

Summary

Web 2.0 tools may be able to close the digital gap between teachers and students if teachers can integrate the tools and change their pedagogy. The TPACK framework developed by Koehler, Mishra and Yahya (2006) has outlined the elements needed to effect change, and research on Web 2.0 tools shows its potential as a change agent, but little research has looked at how the two interrelate. A rigorous phenomenological research methodology was used to examine the “lived experiences” of seven teachers successfully adapting pedagogy with Web 2.0 tools giving an in-depth qualitative analysis of how and why teachers integrate Web 2.0 to change pedagogy. The research validated the use of TPACK as a framework as well as the use of phenomenological research methodology in researching about educational technology.

The goal of the research study was to examine what process teachers use to change their pedagogy to deliver effective instruction using Web 2.0 tools. The purpose of the study was to understand how their technological, pedagogical, and content knowledge (TPACK) supported the use of the tools in the classroom.

Many researchers have discussed the challenges for teachers adapting curriculum and pedagogy to meet the needs of 21st century learners (Harris, Mishra, & Koehler, 2010; Kumar & Vigil, 2011; Speak Up 2010, 2011; Wang, Ertmer, & Newby, 2010). Other researchers (Spivy, Young, & Cottle, 2008) have identified that Web 2.0 tools such as blogs, wikis, Edmodo, Animoto, Voki, social networking and bookmarking tools, may be just the tools that will enable teachers to adapt pedagogy. The ease of use and user

friendly interface makes learning the tools easier for teachers. Prior research has focused on how teachers learn the technology but not how they adapt it for effective use in classrooms. (Brown & Crawford, 2005; Levin & Wadmany, 2008; Linckels et al., 2009; Scrimshaw, 2004; Unal & Unal, 2010). The development of the Technological, Pedagogical, and Content Knowledge (TPACK) framework by Koehler, Mishra, & Yahya (2006) has given researchers a measure to examine and affect change in pedagogy. Several researchers (Archambeault, Wetzel, Foulger, & Williams, 2010; Bull, Hammond & Ferster, 2008; Harris & Hofer, 2011; Ward, Lampner, & Savery, 2009; Williams, Foulger, & Wetzel, 2010) have used the framework as a guideline for exploring teacher professional development. The connection between how learning occurs and teachers' technological knowledge has been examined in different content areas. In this study the framework was used to frame the research questions for a phenomenological study.

Cilesiz (2011) built a contextual and theoretical framework for using phenomenological research methodology in educational technology. A strong research base focused on teachers' experiences with integrating technology into classrooms built her contextual framework. Her theoretical framework suggested that because phenomenological research looks at the "essence" of the meaning of experience, it is the proper methodology for adaptation of pedagogy and technology. Researchers (Cilesiz, 2011; Creswell, 2003; Creswell, 2007) have defined the "essence" as the common or universal conditions or quality of an experience. Finding the "essence" in this study involved gathering data from the voices of seven teachers through three interviews, and finding the themes of these experiences, then developing a deeper understanding of their experiences through phenomenological research methodology particularly that proposed

by Cilesiz(2011). Using the proposed research methodology tested that framework for use in educational technology. In addition, this research tested another use of the TPACK framework, thus adding to the field of research.

Proper phenomenological research methodology was utilized in this study including engaging in epoché, or reflection, creating a subjectivity statement, gathering data from participants, horizontalizing and using phenomenological reduction to capture the “essence” of the phenomena, then using imaginative variation to describe and synthesize the experiences in written descriptions. Engaging in epoché or reflection helped the researcher to be aware of her own biases of the topic. The subjectivity statement clarified the researcher’s positions on the topic, and the bracketing process continued that subjectivity throughout the study. Data was solicited from the voices of seven secondary teachers who adapted their pedagogy to use Web 2.0 tools in their classrooms. Two of the interviews with the teachers were taped and transcribed. Both of these interviews contained questions based on the TPACK framework built by Koehler, Mishra, & Yahya (2006) in order to focus the study. The first interview was an open-ended life history interview, and the second interview focused more on in-depth reflections based on the TPACK framework round the teachers’ use of Web 2.0 tools to adapt pedagogy. The third interview was unstructured, and the participants took on the role of co-researcher, as described by Moustakas (1994), clarifying the interpretations of the interviewer.

Participant selection in phenomenology requires that participants have significant experience of the phenomenon, so criterion sampling was used to choose teachers who had at least one year teaching the same content, and at least one semester utilizing the

Web 2.0 tools in the classroom. In addition, the participants had to be willing to share their experiences. Pseudonyms were given during any reporting to protect the privacy of the participants, and all IRB protocols were followed. Participants included one middle school language arts teacher, two middle school computer science teachers, one high school and one middle school science teacher, one middle school music teacher and one middle school social studies teacher.

The first two interviews were conducted with approximately one week between interviews, while the third interview took place after the analysis of the data. Since the third interview took place during the summer when teachers were not locally based, two of the third interviews took place digitally with the participants using email to express their reflections on the researcher's interpretations of the data. Their suggestions were included in the final edited synthesis.

Data analysis included horizontalization of the data, using in-vivo coding on the transcripts of the 14 interviews resulting in 116 codes or meaning units. The meaning units for each participant's two interviews were merged and the textural and structural descriptions describing their experiences were written using imaginative variation. Once the data was analyzed, a composite textural description and a composite structural description were written then combined into a textural-structural synthesis of the experience which was sent to the participants for their feedback, and adjusted to reflect their input.

The description of the teachers' experiences were given in the textural and structural descriptions for each participant, and the essence of the experience came from the composite textural and composite structural descriptions which were summarized in

the textural-structural synthesis. The synthesis was critiqued by the participants during the third interview, and changes were made to reflect their suggestions. The essence of the phenomenon centered on interrelated themes supported by the TPACK components as indicated in the textural-structural synthesis of the study.

Based on data gathered from teachers' voices, this phenomenological study has indicated that Web 2.0 tools such as Animoto, Voki, Diigo, Wiki, Voice Thread, Cartoon Maker, Prezi, Edmodo, Podcasting, Wordle, Wallwisher, IEarn, and Edline discussion boards are being utilized in secondary classrooms in the school district being studied. The reasons teachers utilized the tools were for the advanced learning opportunities provided by the tools, or for differentiating instruction. They recognized that the tools can aid challenged readers and writers to express themselves using pictures rather than words. The tools can aid the teachers in assessing students' skills in content concepts because the students can express their individual knowledge on a discussion board. This allows the teacher to see individual student thinking and aid them in their misconceptions, and support them in their learning. The discussion boards also encourage deeper level thinking when students have to defend their answers to their peers. In addition, because students can utilize different modalities with the tools, the students' confidence in their skills increases. In other words, the teachers planned the use of the tools so they would aid their students in learning.

Teachers' opinions regarding the technological factors, such as access to web sites, computers, or speed of the internet, which either supported or hampered their use of Web 2.0 tools (Levin & Wadmany, 2008; Koehler, Mishra, & Yahya, 2006) were that they needed to do whatever was needed to overcome the technological challenges, and

use whatever supports they could. One of the biggest challenges mentioned by teachers was getting access to computers whether in the lab or in the classroom. The labs were frequently being used for statewide testing, thus limiting access. Various other challenges were mentioned, and the teachers utilized many supports to overcome these challenges. First and foremost was that the teachers spent an extraordinary amount of time “playing” with the tools even if they had had formal training on them. This time allowed them to become familiar with the tools and figure out where the tools fit their curriculum. In addition, the teachers used any help files available, or would contact a colleague to help with the challenges. Sometimes that colleague was the media specialist, an integration specialist or a team mate that was more tech savvy. Occasionally technical support personnel were also involved.

Previous research has focused on teacher professional development in instructional technology with pre-service teachers (Brown & Crawford, 2005; Levin & Wadmany, 2008; Linckels et al., 2009; Scrimshaw, 2004), or with in-service teachers on individual tools such as Webquests (Unal & Unal, 2010). This research extended previous studies to include an in-depth view of in-service teachers’ experience with a variety of Web 2.0 tools (Pan & Franklin, 2010) and focused on TPACK (Kohler, et al, 2006). This research points to ways to make the change process easier for teachers, administrators, and students.

In addition, utilizing a rigorous phenomenological approach supported Cilesiz’ (2011) conceptual and theoretical framework of phenomenology as a primary research method for educational technology. The use of the TPACK framework during the

interview process further supported that framework as an additional tool for research with in-service teachers.

Appendix A: Epoché

“The challenge facing the human science researcher is to describe things in themselves, to permit what is before one to enter consciousness and be understood in its meanings and essences in the light of intuition and self-reflection. The process involves a blending of what is really present with what is imagined as present from the vantage point of possible meanings; thus a unity of the real and the ideal.” (Moustakas, 1994 p. 27)

Even though this researcher was born forty years before most digital natives, as defined by Jukes (2007), I still consider myself a digital native. I was born as an IBM rug rat. My father worked for IBM as a field systems engineer who fixed “big blue” during World War II in Europe, then at Johns Hopkins Applied Physics Lab in Maryland following the war. Since part of his position included making sure the computers were fixed and working, he would come home with reams of long computer paper which became my drawing paper, and key punch cards that were turned into my first flash cards. I was always fascinated by the “digital” holes in those keypunch cards, and would try to figure out the patterns they made. As I grew up, conversations about computers and their possible uses were frequently discussed at our supper table. I remember one time, in the 1970’s, my dad predicted that someday people would wear computers on their wrists. The fact that today’s digital natives have come close to doing just that with their cell phones and digital devices attached to their hip or ear, is a testament to my dad’s prediction.

As I explored my own career options as a young adult, I considered entering the computer field, but doubted my own abilities to be able to thrive in the programming field. Since I babysat my siblings and several other families frequently in my teens, I leaned toward education for a career as suggested by my mother. However, my ears

were constantly tuned to watch for technical advances, and when a computer lab with Apple IIe's was installed in the room next to my classroom in my current district, I was constantly taking my students to the lab to work. Subsequently, I became the "how to" person at my school for troubleshooting when other teachers began trying to use the lab. In 1988, when a 1200 baud modem was installed in that lab, I was the first to do an "email" project with my students. We wrote emails and sent them through the modem to a class in a school two miles down the road. That class returned the emails, and my love for online communication and learning was sparked. A few years later, a group from Boulder, Colorado was offering a weekend workshop at the University of Delaware for teachers on the topic of the "Internet". Another teacher and I asked to attend, and our principal encouraged our participation. As part of the requirements for the workshop, the principal had to agree to put a phone line in our classrooms. The principal, another teacher and I went in on a Saturday and ran the phone lines ourselves between our two classrooms to give us that access. At this point, the World Wide Web had not been invented yet, and all communications were DOS based and textual in nature. But even at that point, I was fascinated with the potential for teaching and learning. The fact that my students had access to information at any university in the world was inspiring.

Eventually, I went back to school for my Master's degree in Technology for Educators, receiving instruction on not only the technology but the pedagogy that was a natural fit for it. My formal training was a two year program, and our assignments focused on using the technology within our own curriculum. We were challenged to find ways to make the best use of the technology, and yet always cautioned against

technology use for technology's sake. In a way, we were made aware of our TPACK before the framework became identified as such.

When Mozilla, and consequently Netscape were invented, I immediately saw the potential for teaching and learning. During this time, my district was not supportive of technology in the classroom, as most of the Apple labs were dying, and there were limited funds to replace them. Several other teachers and I tried to start a grass roots training movement to get teachers interested in using technology. I created a website for my classroom and the district with links to all kinds of resources for teachers, and we conducted training on the Internet at public libraries and invited teachers to attend. We had very limited success due to the lack of support from the district.

During my Master's program, my students and I also became involved with Kidlink, an organization with global online activities for classrooms. The fact that my students were able to do projects with students around the globe via a dial-up modem showed me the potential for this medium. However, even though my students and I were learning globally at an astonishing rate, my district was unable to see its potential because they had put a moratorium on phone lines in classrooms. So I was the only teacher in the district able to utilize this medium. When I put in for a curriculum award for the projects my kids were producing, the application was returned to me because the judges could not "see" the work of the kids (they didn't have access to a computer), and it wasn't replicable throughout the district. A few years later, a Supervisor of Technology was hired by the district to rectify the lack of technology use by teachers in the district. She created a cohort of teachers that developed a training program for teachers to utilize technology. Since the major members of this cohort had participated in the same Master's

program that I did, our focus for training was on teaching teachers to use the technology in their own curriculum. We developed training programs for a couple of software programs, such as Kid Pix and Inspiration, that could be adapted for use in most of the district's current curricula and across content areas. These training sessions were offered after school or in the summer as short in-service courses, and encouraged teachers to look at their curriculum to see ways they could "fit" technology into it. Teachers were grateful for the training, and years later, I'm still hearing from some that I trained back then, and how I changed their lives and helped them adapt to today's technology.

In the meantime, the multi-disciplinary work of my students with a teacher in Denmark writing a mystery story together, with the aid of a writer in New Hampshire, caught the eye of a publisher in London, and the writer and I were asked to write a book about writing online for global students and other teachers. With my students and I being recognized nationally and globally for our work, yet not being recognized by the district, I was feeling that I couldn't grow professionally in the district. So I sought employment in other scenarios.

The job search brought me into the higher education scenario. As a result of writing the books, and my Master's degree work, I was asked to teach a May mini-course at my institution on Writing Across the Curriculum Using Technology. I was honored to be asked to teach at such an esteemed university, but also relatively new in the adult education environment. I had never been trained to teach adults, and although I had taught the in-service courses, this was something at a higher level, and I worried about my abilities to deliver instruction at that level. In the meantime, my job search brought me to leave the district and work at another local four year institution in the IT

department as an Instructional Technology Specialist. My position was grant funded and created for the purpose of training faculty to use technology, specifically Blackboard, in their classes. The online platform was a new initiative to the institution. The challenge of my position was that my boss was strictly IT based, and had therefore focused on teaching the ins and outs of the software, while with my background, I wanted to focus on helping faculty adapt pedagogy. As a result of this position, I worked with faculty in every department, and was able to experiment with different types of training. We did brown bag seminars, as well as workshops, and individualized training basically holding the hand of faculty as they struggled through the changes. Eventually, I was able to make connections with the Provost in charge of staff development, and able to set up a week long training course for the English department, helping them to integrate not just Blackboard, but other technologies throughout their courses to fit their pedagogy. During this time, I was also working part-time with the Education department, and teaching their equivalent of Technology across the Curriculum course for pre-service teachers. This was a regular semester course, and the focus of the course centered on instructional design, yet my job was to teach the technology skills so my students could use them in their lesson designs. While I felt more confident teaching these courses than I did at my previous institution since I now had been in adult education longer, I felt I learned quite a bit from the courses and professors in that department as well. The instructional design focus made me rethink the pedagogy pieces and made me a stronger educator.

During this time, I also made some valuable contacts in the research world. Three of the professors I worked with on adapting Blackboard included such well known researchers as Zane Berge, Lyn Muilenburg and Jenny Preece, all names that I would see

over and over again when I pursued my own research in later years. Being able to work with them as they worked through some of their own learning curves was truly inspiring.

When my grant ended with that institution, I moved onto working under the PT3 grant at a university in Southern Colorado. This position was as an Instructional Technology Specialist with the Education Department, and again involved working with faculty to include technology in their courses. However, this time all the faculty were teaching pre-service teachers and the goal was for them to adapt their own pedagogy so that their students were exposed to the technology during their courses and could utilize it when they went to their own classrooms. Working in the department was an eye opener, as one of the projects being developed there was a database that enabled student teachers to create a portfolio of the things they learned during their program. The fact that 64 different skills needed to be measured seemed daunting, yet having been a teacher, I realized that it was also realistic as teachers do have to have all those skills. It gave me a new appreciation for what teacher educators needed to be teaching. While most of the training I did in this department consisted of one on one training with individual faculty, my colleagues and I also helped pre-service teachers meet the technology requirements in the 64 standards, and also did in-service training workshops for a couple of the local district schools. At this point in time, I regret that we never really did follow up at those schools to see if our technology focused workshops actually led to changes in pedagogy. However, as a researcher it would be hard to decipher how much of the change in pedagogy was due to our training sessions and how much was due to the impact from student teachers bringing the technology into the classrooms. Part of the department philosophy was that pre-service teachers could borrow laptop carts and other

technologies to take to the schools for their lessons. Hopefully, seeing the student teachers use it would encourage in-service teachers to utilize it as well.

An additional experience that I had during this sojourn with this department was to be able to mentor pre-service teachers in their positions. The Boards of Cooperative Educational Services (BOCES) for the one school district offered mentors to help new teachers who were career changers adapt to the classroom. These were individuals who had bachelors' degrees and experience in other fields, and decided to change to teaching. As part of their program, they had to take courses at the university during their first two years of teaching. Mentors were provided to observe them and give them feedback that did not officially count in their observation process. Two of the teachers I mentored were secondary teachers in a school that was so small that they were a K-12 school which that year had a graduating class of 1 student. The students were so spread out that they had a 2 hour ride to school on the bus. The teachers lived in trailers around the school building. The teachers' only taught a half a day with face to face students, and were using online curriculums the other half of the day to teach the students who lived at a distance. I was there to mentor their face to face classes.

Another teacher I mentored taught full time for a different school in an online classroom with elementary students. The online program involved kits sent to parents to use with their kids, with the teacher following their progress online. Weekly contact was maintained between the teacher, parents, and students. Since her curriculum was already created for her, meeting the requirements for her 64 pre-service standards was challenging. Since she had to make adaptations for high needs students, we were able to use some of her lessons for them to meet her standards, but we also had to adapt many

online skills she utilized as examples of the skills she needed to meet for certification. This was my first exposure to virtual schools for K-12 students, and made me aware that virtual teachers may need a whole new set of skills from regular teachers. It also brings up a research question about how TPACK will be involved with them. Since their content is taught by the computer, and they adapt the computer based curriculum to meet student needs, will it change the balance between TK, PK and CK?

My position with this university changed when the PT3 grant ended and a new grant began. My position under this new grant involved creating online courses for the education department. It involved a whole new look from my standpoint of how to teach what the professors were doing in their classes in an online format. What pedagogies could be adapted, which had to be changed, which ones could be kept, and when and why should some be changed. With input from the faculty, and my own knowledge of teaching, it was an interesting learning curve and one that I relished. However, it also meant that my job entailed being behind a computer screen 40 hours a week, with limited interaction with others. Once I received guidance from the professors about the syllabus and their pedagogies, I was left doing a copious amount of web design to make it all work on the computer, and behind the Blackboard shell. I missed working with kids and teachers, so wanted to return to the K-12 classroom, and did so for a year in a small elementary school in the Rocky Mountains.

My next position as a Teacher on Special Assignment (TOSA) with a very technology literate K-12 district outside of Denver included several tasks. The main function of my position was to aid 14 schools in developing training plans for their faculty to help them include technology in their teaching. These plans had been written

with the previous person in my position, and I just needed to follow through to see how the plans were working. The schools each had a technology liaison who received a stipend and was responsible for delivering the training and kept the labs in working order. The training plans differed but most worked along the lines of a “mini” university where the training was delivered on a regular basis either before or after school, and teachers received in-service credits for attending. Sometimes the training sessions were focused on the technology skills, but most of the time teachers were encouraged to share their pedagogy tips as well. As the TOSA, I was responsible for keeping the liaisons trained in a “train the trainer” type format on any developing technologies so they could share with their faculty. Occasionally, I was asked to assist individual teachers with putting technology components into their lessons.

In addition, the TOSA position included meeting on other committees such as the online learning committee, the Math System Improvement Team, and the System Curriculum team to see how technology could be blended throughout the system. This is where I felt most of my energies should have been spent. The district was already strong in technology use, because the teachers had the support from the administration, but their jobs would have been made easier if links were created in the curriculum. Unfortunately, my supervisor disagreed, and although some major changes were accomplished, I was unable to bring about the total results that I envisioned. At the end of the year, my position ended, and family problems caused me to return to Maryland.

The return to my home state found me working for a virtual school as their professional development manager, however, that position was already being handled by two very strong trainers who had more experience in virtual training than I did. It was

interesting to see training handled for virtual teachers in a completely different format. Their training was done with the use of Elluminate and focused more on online pedagogy than on either the content or the technology. Since their content had been created by instructional designers, teachers had to supplement the curriculum for those students who needed extra help. Technology was already built into the curriculum via the use of multi-media to teach the concepts, or the use of Elluminate for classroom meetings. Teachers were able to give feedback to the instructional designers about the content, so it could be improved from year to year. Since the trainers were so strong and efficient, my position eventually turned to being their online computer education teacher for 600 students. This position eventually went to part-time and gave me a chance to return to my old district for face to face teaching. The next year, while still teaching face to face, I changed my virtual teaching to another virtual school, and received similar training to that of the previous online school. The format was similar, in that we had curriculum already created for us, and we had to adapt it to meet the needs of our learners. The technology again was already built in with multi-media presentations when needed in the curriculum (created by instructional designers), and online class meetings when needed to teach a concept.

In returning to my district, I found that they had moved forward somewhat with technology in the classroom, but not as much as either the previous two districts or the virtual schools in their support of technology at the administrative level. This district had progressed with the help of E-rate legislation to the point that every classroom had a computer, and labs were equipped with computers that were refreshed every five years. At the time I came back the latest initiative was to put Promethean boards in every room

and train teachers to use them. This training was done in a face to face manner, and a year later turned to an online course using Moodle. The filters on the internet were so tightly controlled that many sites were locked out for teachers and students including Web 2.0 tools. The restriction on Web 2.0 tools was lifted last year and training via an online course and short workshops have been conducted to prepare teachers to utilize them. While the format of both the online course and workshops focuses on the “how to” for the technology, the online course does encourage and support teachers to create lessons in their own curriculum for using the tools, and to share them with each other.

With the variety of professional development that I have both participated in and presented, my general perceptions of technology, pedagogy and content are broad and extensive, and my mind is always open to new ideas. It is from this open viewed background that I will be conducting this study and will make every effort to bracket my beliefs throughout the study.

Appendix B: Email Call to Participate in the Study**To: District Secondary teachers |****Subject: Research Study on Web 2.0 tools****Dear teachers,**

Do you use Web 2.0 tools, such as blogs, discussion boards, wikis, Google Docs, Prezi, Wallwisher, Edmodo, or other interactive online tools in the classroom? If you are a secondary teacher, and have taught in your current subject area for at least a year and have been utilizing the tools in your classroom for at least a semester, you are invited to participate in a research study.

The study would involve your participation in 3 interviews of approximately one hour in length. The time and place can be of your choosing, but the first two will be in May or June, and a third in August. The first interview will be an open-ended interview about your life history as a teacher and classroom practices. The second interview will focus on your reflections about how the Web 2.0 tools fit your pedagogy or how you've adapted the pedagogy to utilize the tools. The third interview will ask you to clarify the interpretations of the researcher from data gathered from previous interviews.

The research study will be a qualitative phenomenological study using the lens of teachers' perspectives about their technological, pedagogical, and content knowledge and how they've adapted their pedagogy to utilize the above Web 2.0 tools in the classroom.

The researcher is a Computer Education teacher in the county, working on a doctoral dissertation, and would appreciate your help. In return for your participation, the researcher will offer mentoring or training on additional Web 2.0 tools that you have been wanting to learn. The results of the study will help to shape further staff development for teachers.

If you are interested in participating in this study, please reply to this email and include your contact information in your response.

Sincerely,
Barbara (Schulz) Boksz, Ed.S., ABD
Computer Ed Teacher
Magnolia Middle School (# 410-_____ or mobile #410-_____)
Barbara.boksz@hcps.org

Appendix C: Cover Letter and Adult Consent Form

Wednesday, May 16, 2012

Re: Research Study “*An Examination of Teachers’ Integration of Web 2.0 Technologies in Secondary Classrooms: A Phenomenological Research Study*”

Dear _____

Thank you for your interest in my dissertation research on the experience of using Web 2.0 tools in the classroom. I value the unique contribution that you can make to my study and I am excited about the possibility of your participation in it. The purpose of this letter is to give you more details and to secure your signature on the Adult Consent Form that you will find attached.

The research model I am using is a qualitative one through which I am seeking comprehensive descriptions of your experience. In this way I hope to illuminate or answer my question: “What is the experience of adapting pedagogy while using Web 2.0 tools in the middle or high school curricula?”

Through your participation, I hope to understand the essence of adapting pedagogy for the best uses of Web 2.0 tools as it reveals itself in your experience. You will be asked to recall specific lessons, activities, situations, events, or learning that you experienced as you adapted your pedagogy. The questions you will be asked will focus on your technological, pedagogical, and content knowledge (TPACK) and how they relate to Web 2.0 tools. I am seeking vivid, accurate, comprehensive portrayals of what these experiences were like for you: your thoughts, feelings, and behaviors, as well as situations, events, places, and people connected with your experience. A digital copy of the questions will be emailed to you to look over before each interview.

I value your participation and thank you for the commitment of time, energy, and effort. If you have any further questions before signing the release form or if there is a problem with the date and time of our meeting, I can be reached at the contact information at the bottom of this letter.

Please read and sign the attached Adult General Consent and indicate below which days of the week would be best to meet with you for your interviews. The interviews will take place at your home school unless you indicate that somewhere else would be more convenient. Return the attached paperwork through the courier to Barbara Bokszy @ Magnolia Middle School as soon as possible. You will be contacted by email to set up particular dates.

Appendix C: Cover Letter and Adult Consent Form (continued)

My Home School is _____
Monday, Tuesday, Wednesday, Thursday or Friday (circle your choice) is best to
schedule my interviews. I can be reached @ _____ or



NOVA SOUTHEASTERN UNIVERSITY
Graduate School of Computer and Information Sciences

NOVA SOUTHEASTERN UNIVERSITY
Institutional Review Board
Approval Date: APR 24 2012
Continuing Review Date: APR 23 2013

Adult/General Informed Consent (Rev. 9/20/2011)

Consent Form for Participation in the Research Study Entitled "An Examination of Teachers' Integration of Web 2.0 Technologies in Secondary Classrooms: A Phenomenological Research Study"

Funding Source: None.

IRB protocol #: 03131211Exp.

Principal investigator(s) Barbara A. Boks, Ed.S 423 Paradise Rd. Aberdeen, MD 21001 410-272-2646	Co-investigator(s) Dr. Ling Wang Graduate School of Computer and Information Sciences 3301 College Ave. Fort Lauderdale, FL 33314 954-262-2020 lingwang@nova.edu
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For questions/concerns about your research rights, contact:

Human Research Oversight Board (Institutional Review Board or IRB)
Nova Southeastern University
(954) 262-5369/Toll Free: 866-499-0790
IRB@nsu.nova.edu

Site Information

Harford County Public Schools
102 South Hickory Avenue
Bel Air, MD 21014
410-838-7300

What is the study about?

The purpose of this proposed research study will be to examine what process teachers use to change their pedagogy to deliver effective instruction in the secondary classroom using Web 2.0 tools. The qualitative tradition of phenomenology will be utilized to gather data using the teachers' voices about their professional growth as they adapt pedagogies. The data will be analyzed for themes in the lived experience of the teachers, and will provide implications for professional development assisting in making the change process easier for teachers, administrators, and students.

Why are you asking me?

You have been asked to participate in this study because you are a secondary teacher with at

3301 College Avenue • Fort Lauderdale, Florida 33314-7796 • (954) 262-2000 • 800-541-6682, ext. 2000
Fax: (954) 262-3915 • Web site: www.scis.nova.edu

least a year experience teaching your current subject area and have used Web 2.0 tools such as blogs, discussion boards, wikis, Google Docs, Edmodo, or other interactive online tools in the classroom for at least a semester. You will be one of 10-15 participants involved in the study.

What will I be doing if I agree to be in the study?

The research model being used is a qualitative one through which comprehensive descriptions of your experiences will be sought. Three interviews will be conducted of approximately one hour duration. The first interview will produce a brief synopsis of each participant, and will include the following information: first name, teaching position, number of students, grade level, school and content area, and your previous training on Web 2.0 tools. A second interview will be conducted to ask about the following topics in order to help the researcher come to know and recall each participant:

1. What Web 2.0 tools are used in the classroom by teachers' and their students? How are these tools being utilized?
2. What are teachers' opinions regarding the technological factors, such as access to web sites, computers, or speed of the internet, which either supported or hampered their use of Web 2.0 tools (Levin, 2009; Koehler, Mishra & Yahya, 2006)?
3. How does teachers' knowledge of their content impact the decisions they make for choosing specific technological tools to teach that content (Koehler, Mishra & Yahya, 2006)?
4. How is teachers' pedagogy adapted for using the Web 2.0 tools, particularly what are teachers' opinion on which parts of their classroom practices are successful or unsuccessful and why (Levin, 2009; Koehler, Mishra & Yahya, 2006)?
5. What activities with the Web 2.0 tools do teachers' feel are easily adapted to teach their content (King, 2002; Koehler, Mishra & Yahya, 2006)?
6. How does use of the tools improve teaching or learning?

A third interview will be conducted in which the researcher will share her interpretation of the data gathered with you, and you will be asked if this reflects your thoughts accurately.

A pseudonym will be utilized for your name during the data analysis and reporting stages of this research.

Is there any audio or video recording?

This research project will include audio recording of each of the three interviews using an audio recording device. This audio recording will be available to be heard by the researcher, the IRB, the dissertation chair or committee, and Harford County Public Schools as appropriate. The recording will be transcribed by the researcher. The recording and all notes and data will be kept securely in a locked box. The recording will be kept for 36 months after the research has been completed and destroyed after that time in an appropriate manner. Because your voice will be potentially identifiable by anyone who hears the recording, your confidentiality for things you say on the recording cannot be guaranteed although the researcher will try to limit access to the tape as described in this paragraph.

What are the dangers to me?

This study carries minimal risk and all precautions will be taken to ensure that no additional risks occur. However, this research study may have unknown or unforeseeable risks. One risk is the loss of time needed for the three one hour interviews. Precautions will be taken to minimize those risks by scheduling them at a time and place convenient for you and not

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during your teaching time. A second risk is a possible breach of confidentiality or loss of anonymity. This risk will be minimized by using pseudonyms in any reports shared with the district or published in the final report.

If you have any questions about the research, your research rights, or have a research-related injury, please contact the researcher, Barbara Bokszy, or Dr. Ling Wang, the dissertation advisor at Nova Southeastern University School of Computer and Information Sciences. You may also contact the IRB at the numbers indicated above with questions as to your research rights.

Are there any benefits for taking part in this research study?

There are no direct benefits to participate in this study.

Will I get paid for being in the study? Will it cost me anything?

There are no costs to you or payments made for participating in this study. However, additional training on Web 2.0 tools from the principal investigator, in compensation for your time, can be requested.

How will you keep my information private?

Data may be reviewed by the IRB, Harford County Public Schools, the principal investigator, Barbara Bokszy, and the dissertation chair, Dr. Ling Wang. All names on notes and reports will be pseudonyms for actual participants' names to protect their privacy.

All information obtained in this study is strictly confidential unless disclosure is required by law. All data gathered, including tapes, transcripts, notes, and reports will be kept confidential and in a locked environment for 36 months from the conclusion of the study, then destroyed appropriately.

What if I do not want to participate or I want to leave the study?

You have the right to leave this study at any time or refuse to participate. If you do decide to leave or you decide not to participate, you will not experience any penalty or loss of services you have a right to receive. If you choose to withdraw, any information collected about you **before** the date you leave the study will be kept in the research records for 36 months from the conclusion of the study and may be used as a part of the research.


Other Considerations:

If significant new information relating to the study becomes available, which may relate to your willingness to continue to participate, this information will be provided to you by the investigator.

Voluntary Consent by Participant:

By signing below, you indicate that

- this study has been explained to you
- you have read this document or it has been read to you
- your questions about this research study have been answered


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- you have been told that you may ask the researcher any study related questions in the future or contact them in the event of a research-related injury
- you have been told that you may ask Institutional Review Board (IRB) personnel questions about your study rights
- you are entitled to a copy of this form after you have read and signed it
- you voluntarily agree to participate in the study entitled "An Examination of Teachers' Integration of Web 2.0 Technologies in Secondary Classrooms: A Phenomenological Research Study"

Participant's Signature: _____ Date: _____

Participant's Name: _____ Date: _____

Signature of Person Obtaining Consent: _____

Date: _____


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Appendix D: First Interview Question Guide

Name _____

Teaching position _____

Number of students _____ Grade levels _____

School _____ Content area _____

- The focus of this interview will be to get to know you a little better and learn about your overall teaching experiences.

(TK)

- Tell me about your experiences of using technology in the classroom.
 - How did you learn to use technology?
 - How did you start using technology in your classroom?
 - Tell me about some challenges and successes you've had with using technology.
 - Did the Web 2.0 tools enhance the content or teaching strategies? If so, how?

- Tell me about your content area. (CK)
 - How did you become interested in your content area?
 - How deep is your knowledge of your content?
 - How long have you been teaching your content?
 - Is there a particular approach or teaching strategies you use to teach your content?
 - To what extent did you know about technologies that could be used in your content area?

- Tell me about your pedagogy. (PK)
- What is a typical lesson like in your classroom?
- Tell me about your classroom management.
- Does your classroom management change when you use Web 2.0 tools? Why or why not?
- What type of learning activities do you utilize in the classroom with or without technology?
- Has learning changed with using the Web 2.0 tools?

- Tell me about your training with Web 2.0 tools. (TK)
- Where did this training take place?
- What was the format of the training?
- Where there any technological challenges that impacted your utilization of the Web 2.0 tools?
- What technological supports helped you be successful in using the Web 2.0 tools?
- Where there any other supports (administrative or instructional) that helped you use the tools?

- How were you able to pull together the content outcomes, pedagogy techniques and Web 2.0 tool use? (TPACK)

Thank you for your participation.....

Appendix E: Second Interview Question Guide

Name _____

Teaching position _____

Number of students _____ Grade levels _____

School _____ Content area _____

<p>1. Revisit the first interview to clarify any questions that arose.</p>
<p>2. Tell me about the Web 2.0 tools you use in the classroom by you and your students? How are these tools being utilized? Why are you using those tools?</p>
<p>3. What technological factors, such as access to web sites, computers, or speed of the internet, which either supported or hampered your use of Web 2.0 tools (Levin, 2009; Koehler, Mishra & Yahya, 2006)?</p>
<p>4. How has your training in technology impacted your decisions about Web 2.0 tools? (Koehler, Mishra & Yahya, 2006)</p>

5. How has your knowledge of your content impacted your decisions for choosing specific Web 2.0 tools to teach that content (Koehler, Mishra & Yahya, 2006)?

6. How did you decide which materials, tools, and resources to use to teach your content?

7. How have you adapted your pedagogy for using the Web 2.0 tools?

8. Which parts of your classroom practices are successful or unsuccessful and why (Levin, 2009; Koehler, Mishra & Yahya, 2006)?

9. What activities with the Web 2.0 tools are easily adapted to teach your content (King, 2002; Koehler, Mishra & Yahya, 2006)?

10. How does use of the tools improve teaching or learning?

11. Is there anything you would like to add?

Appendix F: Third Interview Questions Guide

Name _____

Teaching position _____

Number of students _____ Grade levels _____

School _____ Content area _____

- Discussion and participants' feedback and clarification of my preliminary findings and interpretations of the first two interviews (member check).

- New questions that arose on the basis of the first two interviews.

- Do you have any additional thoughts or opinions?

- Do you have any additional reflections on the meaning and significance of the findings?

Appendix G: Thank you Email to Participants

Dear _____,

Hope you are having a restful summer! Mine has been filled with research and writing. The good news is that I am moving ahead in my work, and I've reached the part where I need to have you check the Synthesis of your experiences. I've attached what I've written from all your interviews.

Keep in mind that I've transcribed all your interviews, "horizontalized" them (which means to break each interview down to find the common "meaning units", then created a textural description and a structural description of each of you, then had to put them all together again, telling about the "essence" of your experiences as a group. This final piece is that synthesis of everyone's experience and what I've attached for you to read.

The idea is for you to read and make comments and changes if you don't feel that it represents your experience. The easiest way for you to do this would be to:

1. Open the attachment in this message (it should open in Microsoft Word).
2. Click on the Enable Editing button. I've turned Track Changes on. If you type something on the paper, it should type in red. If it doesn't, go to Review and click on the Track Changes button.
3. Make any changes you think should be made. You can also click on the page, then click on the Comment button to write a comment about something as well.
4. Save the page to your computer somewhere.
5. Then click on Reply to this message and attach the file to your reply message.
6. In the body of the reply, let me know any overall comments you have or let me know if you'd prefer to meet with me face to face. Send the message back to me.

AND IF YOU'D PREFER TO SKIP ALL THESE STEPS, AND MEET WITH ME FACE TO FACE TO TALK ABOUT IT, LET ME KNOW.

This third interview should only be about a half hour for you to share your feelings about what I wrote, and let me know if it does/doesn't describe what you all went through.

I'd like to meet with as many of you as possible in the next week, but that may be a challenge as we don't have our classrooms to go to. I live in Aberdeen, (_____). So if you are in the neighborhood, or want to do lunch, let me know. Or if I agreed to come to your classroom again, remind me.

And if there is something I agreed to do for you, please remind me. I remember most of your requests, but it may have gotten buried in the research I've been plowing through.

I look forward to getting your feedback. All of you are amazing teachers! I've enjoyed sharing your stories, and have learned so much from you all. Keep up the good work! :-)

With warm regards,
Barbara Bokszy

Appendix H: Textural & Structural Descriptions for Debby

Textural Description of Debby's Experiences

I guess my technology training started when I took courses basically provided by the county concerning the basics of technology such as Word, Power Point and Excel to increase my knowledge base. Then I looked online and through efforts of my own found webquests and an interactive Underground Railroad activity, discovery Education, Brain Pop and other internet activities on my own. I found a lot of it by hunting and some of it from information from colleagues.

My knowledge of Web 2.0 came when I took graduate classes through online courses and discovered Blackboard and discussions. I also started in college learning about Wikis and Edmodo which I've applied in the classroom. I learned about wikis and Edmodo from talking to various people. I got a grasp of them in my graduate courses, then I would start asking questions of colleagues, particularly the integration specialist, about doing it here, or I got some ideas in journals. I know there's a lot out there I don't know, but I'm willing to try.

My typical class starts with a drill in the room and usually closure at the end to see if they actually got it, or need a quick review. During ninety minute classes I try to put in something where they can talk to each other. My teaching strategies include using jigsaw and pairing. I have them start on their own, then think and pair. I've also tried role playing. I use readings from the curriculum or that I've found on my own which could be from books, Junior Scholastic, plays or short readings other than the textbook. I've chunked them but sometimes I have them read a novel. I also found the site online that is promoted by Sandra O'Conner. It involves a case dealing with freedom of speech

on tee shirts which are prominent in schools. The students get on the website and listen to two judges arguing a decision from two viewpoints. They have to pick which judge they would side with and have to do activities from each viewpoint.

To do some of these activities, I would pull the students in computer lab. We would do webquests. Then I collaborated with the media specialist and we did an activity where we did like a blog page. It was hard to keep all things going at one time in a blog. The Media Specialist would put in information about a person on there for the students to research. I would collaborate with the media specialist using Inspiration and United Streaming for clips to use in the classroom. Our curriculum actually has technology listed in it now. I now use power point in the classroom for every day for me but also for the kids. That's new this year. I used to use them occasionally, but now it's every day. It organizes me and the kids.

Another use for Web 2.0 is that I had used a picture we look at for westward expansion. I actually have students go in through Edmodo and look at the picture and comment about what they were seeing in the picture and they can respond to each other. Some said, "Oh, I didn't see that". I think it was kind of because all the kids had to respond, so I think it was better than being in the classroom where you only call on a few students. This way they had to respond even if they had the same answer as someone else. I think that was good, I enjoyed that aspect of it. I think the tools enhance the content because each student actually had to look at the picture and respond to it, and form their own ideas about it. It was secondary source rather than a primary one, and had to use the content knowledge they had and put that into play looking at the picture. So they had to use background knowledge in order to understand the picture and respond to

it. They had to look at the broader picture and look in each section of photo and putting the whole together and come up with an answers. On other words, breaking it down into parts to come up with a whole.

I like the Edmodo idea with every pupil response to get their ideas on what they were seeing in the picture. It let me teach it better, because when they are looking at one part of the picture, they are seeing it here, and I could point them to another section or point out facts or things to explore in that area. The tool lent itself well to me improving the teaching and seeing more of their thinking and I could see where students were struggling.

The students did like to blog on Edmodo, however, they wanted to respond to a particular student but weren't able to do that. They'd have to kind of read all of them and then reply back. I've done that with slavery novels and tell about the book and respond to people about what they've read. I really liked Underground Railroad activities on there because it's interactive, they can click on different things on a picture and learn different things about it. This is offered by Scholastic.com.

The challenges in using these tools are several. Previously, when we used the media center and all the students were on at the same time, it would lock up and freeze and we had to start over. We worked through it, and some worked at home. Another main challenge was planning when to get into computer lab. I'll plan then find myself not actually there yet at the time I booked with the lab. Just getting into the computer lab with the planning ahead for when to get into the computer lab and pacing my lessons to be ready at that time is challenging. Sometimes I really had to push the lower groups or slow down the higher group. I would do more with them if they had their own device. It's

hard to plan and set up so far in advance. Sometimes I'd pull in the mobile labs and media specialist has come into the classroom and assisted me. Sometimes things get revamped. I inform the students and they know that I haven't done it before. In addition, getting access to the computer lab, particularly this time of the year with all of the testing, it hampers you. Sometimes I need the lab with help from the integration specialist with something new I'm trying. The Media Specialist has come to the classroom at times with laptops, but if she's being used for testing, she's not available.

I think the tools change teaching and learning. The students are geared for the computer and videos are very visual learners, and if it's interactive or moves, it's better for them. That's why I like the Supreme Court and Underground activity because they are very good. It's very interactive because they can click on here or there and learn things where in a book they have trouble visualizing. On the Court case they can actually see it occurring. And it helps get a better understanding when we come back and talk about it in the classroom. In addition, they've grown up with these tools, so the tools should be a part of their learning.

I pull it all together by being very knowledgeable about my content because I've taught it so long. I know where things might fit when I teach that section and can plan ahead, so that when I find a new tool and can see where it fits into the whole picture.

Structural Description of Debby's Experiences

Debby's technological knowledge comes from a mixture of experiences. She had the interest in the tools and took advantage of some county offered workshops, various professional development activities, and used some tools in her graduate classes. The workshops gave her time to play with the tools and find ways to apply them in the classroom. The graduate program exposed her to some additional tools that she asked colleagues about, particularly the Integration Specialist and Media Center Specialist to

help her put them to use. Over the years of trying new things, she's faced a few challenges with the technology, yet still did not lose her resolve to learn more and apply it for her students.

Debby's content knowledge is varied, since she started out wanting to teach the higher elementary school grades. She didn't know where she wanted to focus, so therefore chose elementary so she could teach all subject areas. Once she attained her teaching degree, she was offered a job teaching math at her current school. In her second through fifth year, she was teaching language arts, and when a position became available in social studies the next year, she moved to that position. She has been teaching Social Studies for several years, and decided that is her true calling. She's since taken courses at the American History Institute focusing on working with primary documents. In addition, she attended the Foundation for Teaching Economics, and eventually piloted economics courses for the State Department of Education. Even though Debby feels that her content knowledge has deepened over the years, she admits that her knowledge has limitations in that her knowledge of history after the reconstruction could use more professional development.

Her pedagogical knowledge, developed through her years of teaching helps her recognize the benefits of the Web 2.0 tools. She previously had utilized such recognized strategies as jigsaw and think, pair, share, and was able to see that they can be applied at a new level. When she describes the students experiences with the court cases, and the blogging on pictures, she touches on recognizing how learning and teaching can change.

Her ability to be successful in these endeavors is evident in the way she can pull her content and pedagogy together and make the new tools fit her classroom. In other

words, her TPACK should continue to support her willingness to keep on trying new tools for the benefit of her students who are millennial learners.

Appendix I: Textural & Structural Descriptions for Teresa

Textural Description of Teresa's Experiences

My technology training consisted of the basic stuff in college and the rest I learned in workshops and working with other people or on my own. In my previous school, we didn't have any tech, not even LCDs. We had to roll the LCD on a cart into the classroom, but that's where I became interested. I could bring my personal computer hooked to an LCD on the cart. Then they started raising funds to buy Smart Boards, specifically for science teachers, so I worked with a Smart board and really enjoyed it. So that's where I started using technology.

When I came to this school I didn't use it a whole lot until I worked with some people in my content area. My colleagues found stuff and previously we had worked with discovery education and other technology in the Media Center. We didn't have Smart Boards, but finally got Promethean Boards. They have very different software, and I had learned the previous software. So I took the 1-3 credit course that summer. Then I learned about document cameras from the integration specialist and we wrote the grant to get more cameras and web cams.

It was the training that sparked my interest. Without the training I wouldn't have known what or how to use the technology. Even when I used iEARN, that training is what helped me get through how to use it. However, with Edmodo I did my own training and followed the online help which helped me decide how to present information or have the kids input information, whether to vote or use questions for homework or responding to each other.

My typical classroom includes very regimented procedures. They come in and write down their homework. At this time I don't have a drill, I call it a "do now" rather than a drill. I found that drills were not always effective, so instead I have a do this or do that, like open up now to a certain place. Afterward I have about 10 minutes of me doing some lecture, then some kind of hands on activity. During 90 minute classes I usually have one or two activities that involve moving or switching seats and have two or three objectives. At the end of class we look to see if we have covered each objective and if so, how? When I plan my lesson I try to hit every piece of learning styles, auditory, kinesthetic, etc. I try... even when I do my lecture to break it up, I try to include two minute clips from United Streaming in a power point with a clip based on just that topic. For example, if I have a lesson on tides, I might have a four minute clip that looked at moon phases. It's me lecturing and the visual as well. I try to hit as many as I can and have hands on labs as well. Sometimes my lesson may have two to three objectives or have the same objectives for two classes or more. The textbook is very difficult. It's a 10th grade book used by students who can be a couple years behind the 6th grade reading level.

As for Web 2.0, I've used Edmodo, I have not used Edline, I stuck with Edmodo. The kids love it and it did help them because they became more engaged. They had to answer personal questions. Using online collaboration the strategy had everyone involved in the discussion rather than in class where only two or three are discussing. That teaching strategy enhanced content learning. They were given questions and had to go out on their own to search for the answers.

When we did Edmodo, the kids really got into it about earthquakes and the causes of earthquakes. They picked up more and learned from each other. I would say go back and verify your answer more. The kids were calling each other out on their answers, and then they had to research and back up their ideas with research and learned from each other.

When I did iEARN, we tried using webcams. We read a book with kids and we planned out the activities and iEARN activities. They had literacy circles. iEARN had their own projects which you had to join, but they did not tie in with what I wanted to do. So I created my own project with online collaboration and posting questions. Others from around the world posted questions as well, it was not necessarily a project as much as getting something out. The biggest challenge was to get OTIS to approve the project, both the webcams and getting parent permissions. With iEARN I had to go up against the technology director. But once approved, the next challenge was getting the webcams to do what I wanted them to do which was to be able to video conference. That was what I wanted, but iEARN was not based that way. They could upload videos but could not conference. Now with Skype you can conference anywhere, but still can't do that here due to technical limitations.

The reason I use Web 2.0 tools is that they are more engaging for kids. I tend to get more positive results when using them. I get more students to complete homework using the Web 2.0 tools. When using them for assessment I can give them more probing questions. The students are more honest if I use the voting rather than raising their hands because they know their votes can't be seen. Forever they will need those technology tools so we need to teach them here and now, so they can keep up in college.

Certain subject matter is easier to use the tools with than others. For example, with concepts in geology, like natural disasters, it is easy to get them talking online. There is more information out there that they can understand enough to blog about, so it is more engaging. But the main focus of weather is nitty gritty in that a lot of information online is difficult to understand. I try to not use them to lead them in the wrong direction. I had to tweak it and make it my own. For example with weather systems, I created stations. They got different pieces at each station, but some of the stations were missing things, so I had to tweak it and made it kid friendly because a lot of stuff out there is pretty intense.

I get some of my teaching activities from the curriculum guides. I also look online to see what other teachers are doing to teach the concepts. I find lessons that go along hand in hand with the resources. For example, in science, the concepts are structural and if I know kids struggle with the concepts I will look for resources that match them. I also use human resources like my science academy coach and talk with her and other co-workers for ideas.

With Web 2.0, you are changing pedagogy from teacher centered to being a facilitator as a guide in the right direction and watching what they are doing. They are more engaged in finding their own information. Sometimes they find the wrong information, and you have to step back and rather than saying that's wrong guide them to other websites or to look at what other kids are blogging and guiding them to rethinking their thinking. That's hard to do.

Some of the challenges with using the tools are when it doesn't work, such as when the power goes out. Also, when kids really don't understand, like if we are using a

laptop, and we're learning a different program, they have different levels of tech skills. Some students come with little or no knowledge coming from other classes so that can be a challenge in heterogeneous classes. A technical problem is that I don't have enough outlets for all the technology pieces. Another challenge is when doing it from home, due to our population of kids, not all have computer or internet browsing or support at home.

In order to overcome some of these challenges, I've gotten help from different sources. The integration specialist is one of the people who helped me work on the grant and on the details for getting the iEARN parts to work. My administrator was an asset for the grant as well. For technical help, I also consulted the online help for Edmodo, which is ok. The iEARN help was ok but the help for Edmodo is more user friendly.

To pull everything together it takes a lot of planning. I had a planning session with the integration specialist, my teammates and myself and honed the idea for using Edmodo for a project. With iEARN I worked with the teacher mentor, who found the book we used for the iEARN project. I feel that it improves my teaching because I'm less stressed. There's more work up front planning it out and when reading all of their responses, but during classes when their leading to the information, they are more engaged because of the tools and their learning tends to be better. In addition, they want to use it again. I would like to expand my knowledge and do a lot more with STEM (Science, Technology, Engineering, and Math) since that is becoming a hot topic for students to learn in the future.

Structural Description of Teresa's Experiences

Teresa's technology knowledge is based on a mixture of training workshops and self-directed learning. Her further interest in using technology in the classroom was

sparked by receiving training on smart boards, and later on Promethean boards. Her interest in online projects and iEARN were sparked by receiving a grant and the web cams. She also took advantage of the online help files for some of the online tools in order to learn how they worked. Throughout her learning process, she received ideas and guidance from the integration specialist and her colleagues to be able to apply the technology to her content. The integration specialist is a full time technology teacher who assists teachers in the school to utilize technology in their classrooms. She was instrumental in helping Teresa obtain a grant and get it approved by the technology director for the district, then being on hand to help the project go smoothly.

Her content knowledge is relatively deep. Her interests started when her own 7th grade life science teacher sparked her interest in the life sciences. She attended undergraduate school for biology and anatomy, and fell in love with microbiology. As a junior in college, she thought about teaching and took an Educational Psychology course that peaked her interest in teaching. She then took student teaching to see if she liked it, and fell in love with teaching. She has been teaching earth science to middle school students long enough now to feel that her knowledge in that field has become deep as well due to the professional development sessions she's taken.

Teresa's pedagogical knowledge has developed throughout her years of teaching and through the opportunities she's had with receiving grants and professional development. She's also been influenced by colleagues in developing classroom activities and materials that match her curriculum. She includes lots of hands on and inquiry based activities, yet has a very structured procedure the students must follow. Teresa has limited her use of Web 2.0 tools to ones she is sure work, like Edmodo and her iEARN

project activities. Although she has grasped the benefits of using them for their interactive and engaging qualities, she also recognizes that certain subject matter can be adapted to their use more easily than other topics. The abilities of her students may limit the use of the tools, whether it is their ability to grasp complicated concepts as they are presented on the web, or their inability to get access to the online tools from home. Teresa adapts the technologies to accommodate student needs by tweaking and adding materials of her own.

Teresa utilizes her content knowledge and pedagogical experiences to create materials that take advantage of the new technological tools for reaching her students. The assistance and supports of her colleagues are also valuable in aiding her to adapt her pedagogy for using the technology.

Appendix J: Textural & Structural Descriptions for Lisa

Textural Description of Lisa's Experiences

My technology training has been a “hit or miss” experience. I’ve had mostly on the job experience. It’s been a slow synthesis of a variety of things such as learning it on my own, or learning through workshops or professional development made available to us because of grants. Out of necessity, I guess I’ve brought my own Ipad because I couldn’t access a lot of things.

We had some professional development involving after school sessions with someone showing us how the tool or software worked, but didn’t give us time to play with it or implement it. It involved learning audacity for creating the podcasts. Then I was using it in the classroom by failing and trying again. I had a TV that could talk to the computer. Then I learned to develop Power Points which were so much more than writing on the board. Finally we got these wonderful projectors and white boards with Active Votes and Active Inspire. With those tools, I can pose clicker questions. Then I learned to use Prezi. What a wonderful opportunity for kids to be able to have these interactive types of presentations.

I became interested in my content from my 9th grade biology teacher. She just was amazing. I saw her last year again. She was my biology teacher and her husband was my algebra teacher. That was the beginning for me and I started taking tests, such as standardized tests that said I had an aptitude for science. So I went to college to become a research biologist, and worked in that field for fifteen years before I became a teacher. As part of my job, I was working as an Instructional Assistant in the Community College

elementary school, and went back to get a Masters' degree in education. That degree included certification in teaching and administration.

My typical classroom looks like chaos, but basically it's about sharing an objective, then having some engagement activity, some presentation of new material which may be with Active Inspire and then an activity that correlates and brings them back to this is why we are learning this. I might actually talk about a recent news article that's related to what we are doing or have them read something related to what we are talking about or have them answer a couple of questions to find out what they know about it, and have a discussion about how it's related to what we are going to learn today. For example, we may talk about osmosis or diffusion and how many take medicines, then how do the medicines get administered and how does it get into the bladder which has a poor blood supply? This points out what we need to learn for real world applications. The presentation of new material using Active Inspire will then lead to or give directions for the activity or experiment. They use active inspire to chart data so we have a classroom set of data versus one set of data and then closure is a summation of the data they've collected. I ask what did they learn and they ask questions related to osmosis or more application kinds of questions.

At one point, we used something called Blueberry, which is software that does screen captures to give directions online about how to create a poster or how to videotape. We created podcasts so the students can see how you do the things, and because it's online, they could listen in their own space and time. I wanted to use Blackboard to share the videos and have discussions, but it's not available in school.

Using the Web 2.0 tools enhances Science content because you can actually pull in a lot of information but not be overwhelming. If it's presented in a power point it becomes overwhelming because it is too much information at once to remember. You can piece meal it on Prezi, instead of going from page to page, we can look at the whole area, or can go out here or there or there. In addition, it can be viewed online and the students know where to go to get the Prezi if they do not get it in class. It is always online and accessible from home so they can see it again. I also use You Tube to point them to videos from home or download and show in class. This year for the first time, I've had the students using Prezi as well.

Some of the successes I've had involve some great responses from kids. I like when they can look at responses and see how many got it right and how many not right. They are interacting and not sitting in their seat and come up and graph data, and then I'm able to print the data and give it to them. These are positive effects on teaching which are more student centered rather than teacher centered.

Challenges have been when I had technology that didn't work, such as my Interwrite board with Promethean software that when I was creating a flip chart, the pen was creating lines which made it so indecipherable that the board wouldn't work. At another time, I actually had flip charts freeze and I had embedded objects into the Active Inspire that didn't embed right. That may have been more about lack of practice versus the tech not being good. Reliance on technology is good, but at the same time when it goes down, breaks or freezes, you have to be able to go back to old school and not be so dependent on the technology. Sometimes, I have kids show me how to do it. Shouldn't we be ahead of the class? For example, just like Ipads, why don't we have them?

However, we can't get on Wi-Fi here, unless they have 3G access, but I understand the security issues.

Another challenge I had was that I was given curriculum built around some software but it didn't come with the software, like PCR gel electrokinesis. That was a very frustrating experience. I had to draw on my own experience and bring in my own things to the classroom. For example, I brought in my own computer and gathered time lapse photography thru the satellite on the other building and picked up the images it was creating. The current curriculum itself, like AP biology curriculum, does not utilize technology other than getting on the computer and looking up URLs or webquests.

However, despite the challenges, I have had support from some amazing people. My colleague can usually figure out what's happening and either has a solution or knows who to go to in IT to get work orders accomplished, or in that case decided the board needed to be replaced.

Some other supports include the online class I am now taking on how to use the Promethean Board. At first I started using the board because it was there, and why not use it, but through the class, I'm getting more ideas on how to use it. Not only does the course show me how to use it, but I have the time to play with things and figure out what I want to do with it.

I do all this to have engaging lessons which equals student learning. I start with the content and draw the outcomes from the content, then pull in the Web 2.0 tools to make the components come together in an engaging way so the students can be using the best way to learn things, then I plan the strategies to make this all work together.

Structural Description of Lisa's Experiences

Lisa's TPACK was a little different than the rest of the participants in this study in that her content knowledge was extremely strong. She admits that she was not a teacher at first but was a research biologist and held jobs for fifteen years in the research field. She obtained her masters in science and then taught at the college level. She had published a couple of research articles in biology, biotechnology, and genetics. She felt that her knowledge was deep but that she can always learn more. Her philosophy is that knowledge is something you are always learning but she felt she had a fairly good grasp on things that she teaches.

Lisa fell into education when she started teaching at the local Community College, and was an Instructional Assistant at the elementary school on campus. She already had her Master's degree in Science then decided to get her second Masters in Teaching and Administration to get her certification.

Her pedagogical knowledge was not as evident in her interview as the other participants. At first she did not really understand what pedagogy meant, but as the interview progressed, and the interviewer pointed out pedagogical things she did in her classroom, we both became aware that she indeed did have some pedagogical knowledge. Even though her pedagogy was not as planned and evident, she became aware of the things that she did, such as her classroom management, strategies for delivering information, and using the whiteboard for several purposes, were evidence of her pedagogy. She has developed that pedagogy through teaching seven different classes a day, on a consistent basis, and instinctively doing what her students need to learn the concepts and objectives.

One fact that may make it easier for her to develop that pedagogical knowledge is that she works in the Science and Math Academy where students have to apply and go through a rigorous interview process in order to be accepted. Therefore, her students are usually there by choice, and want to learn the difficult concepts she can teach them. Therefore, classroom discipline is a minimal part of her pedagogy, and she can focus on delivering content.

Likewise, her technology knowledge has been inconsistent. On one hand, she comes from a field that abounds in technology, so she's not afraid to try new things. And although the support from the district has been "hit or miss", she has taken advantage of what supports are offered to increase her skills. In addition, the program caters to students that have high technology abilities to begin with, and she taps into their strengths and learns the technology along with them.

So Lisa's TPACK is very similar to her own philosophy of teaching in that she is always learning and adapting, but can always learn more.

Appendix K: Textural & Structural Descriptions for Joanne

Textural Description of Joanne's Experiences

My technology training has been largely self-taught in that I've learned some software, webpage design, and html. Even though I had some computer training in college classes such as computer programming, software, and other basic programs, I trained myself on using the Web 2.0 programs. I navigate the software, read about it, learn it, explore. I've found out about them from word of mouth and a search on the computer for Web 2.0 tools. When I found them, I played around and figured out how to use them. I think all software is similar and when you understand one software it carries to others and that includes Web 2.0 tools which are similar, just online software. But you have a different way of presenting knowledge to students, a variety of ways to reach learners.

My goal was to be a government teacher, but I got hired as a Computer Science teacher. My knowledge goes in different directions. I'm more creative than others. I see different ways to use technology to present knowledge and sometimes I use a variety of instruction and have different things to pick from. I have more choices. For example, I tried to use Edline but it's too much to learn, and maneuvering in two environments is hard so I stuck with something that works well. I don't think Edline is as good as Edmodo. I learned Edmodo more. I use it more and train the students how to tag on the right side. I just want them to get a tag on the right so they know how to be organized. I use the tools in Edmodo to pull work from other quarters that are still in the system,

making it more efficient for me. In addition, they can carry Edmodo skills with them because it is used at all levels, so they can use it when they move on.

Voice thread is a powerful tool that most people don't even know about in Language Arts, Social Studies or any subject matter. The way it's set up, you can upload videos. In addition, I use Kia for online quizzes, vocabulary and games. Edmodo has built in quizzes, but Kia is better to create links to the information. However, when you use the Edmodo quiz, it puts it in your grade book and shows the students' averages for their work. It shows the averages, but then I have too many grades to transfer to Edline. I need to learn to upload only one grade into Edline and point students and parents to Edmodo for the grades.

All my instructions are in Edmodo including assignments, grading and I have a hard time trying to get all my files into Edmodo. I have a ways to go to get it all in one area, but then I get afraid that Edmodo will not always be free, so I'm saving in two locations. I use the poll question for the questions of the day. I can give quick questions. I also like the assignment turn in feature where I grade them and try to give them feedback through grading. They get more feedback that way.

My typical lesson has the students come in with a warm up expecting a question of the day or review of a prior lesson. Then I give some direct instruction on new skills. I then give them more practice and then closure. I try to make sure all students can do the class. I sometimes have peer helpers, and they help other kids. I was a project based teacher but that got in my way. I had to redo all my lesson plans and do daily lessons that had to have all the elements of a lesson in each one.

My classroom management involves having a seating chart with a transparency to mark who has finished what and how they are doing in the class. I also have them upload their work in Edmodo to see who had done it. They have exit tickets sometimes. I sometimes directly remove them from the computer and have them sit in chairs. They sit in front of the board and watch me go over spreadsheets to help them get focused because sometimes they are not listening. They have handouts sometimes because the computers can be distracting. So my moving to mobile lab may not be a bad thing because actually technology can be a hindrance. For example, to learn vocabulary they don't need a computer in front of them so I teach them the concept away from the computer to use the software, and then have them use the computer. They think they have to have a computer in front of them to learn computers, but they don't. In college, we didn't have computers and we got lectured in a classroom, and then moved to the lab to work on our own. That mode of learning carried over to what I do. I plan on having more vocabulary and power points to go over the purpose and features of the software. I also want to have more visuals like in Movie Maker on how to gather their information and have them take notes on that.

Some of the challenges are that students come to me with some or no skills. I had to do lesson plans based on individual needs or small group needs. Sometimes the interest in computer science is not where I want it to be. It's more like they want to play games on the computer and I sometimes have to explain a lot to them about why they should learn computer science. Computer science is not taken as seriously as it should be in middle school. It is less important than other subjects.

I use scaffolding a lot, giving them sample work to help them understand what they need to do on their own. Sometimes I have cooperative learning, sometimes whole group lessons, and sometimes independent studies. They do work at stations which have different things in work stations to meet needs of the class.

The reason I am using Edmodo, and other Web 2.0 tools, is for organization, higher communication and higher learning and thinking. There is an easier access to information, an easy way to provide information to the classroom, and it can be used at home and school. Another reason is to gain student interests at a higher level. It's a different way of instruction, instead of just traditional technology.

Sometimes I choose the activity or technology based on their abilities. I give them an assessment then give them the tools. We do writing. Why should I teach them web design, when they can't do word processing? They need keyboarding skills. It depends on their prior knowledge and skills before I make decisions. I use also the curriculum and make sure my lesson plans go around the curriculum. I get very specific when I type it out. I also use strong assessments before I make decisions.

Does learning change? Sometimes kids go home and do work on Edmodo and get involved. The organization is way better. Seeing their responses to their questions and being able to block out and moderate their postings, can be a challenge to grade. They have an increase in their keyboarding skills because they have to respond to questions. There's also been an increase in interest. They can get to files quicker and don't have to look through the shared drive leading to increased productivity.

They also develop higher level thinking and higher communication skills. They have more opportunity to work on assignments on their own. The challenge was that I

can't actually observe them to learn on their own yet it challenges them to learn on their own. We don't have keyboarding in class. In this county we have to give homework to extend the learning to home. So I give them keyboarding for homework. Kids go home and go on facebook, so they should have something they go on that they can learn. It depends on the type of assignment you make, encouraging them to do the work. For example, I challenge them to go home and send me a message on voice stream. It's how you present it to them. If you do it the traditional way, they won't do it, but you tell them to do it on their phone, I don't know how they can afford it, but they can.

I just think technology is going to be so powerful until it's not enough just in my class. I should be able to help all teachers use technology in the school. They (teachers and students) don't realize how to use PowerPoint correctly to present knowledge. Power Points can be overused too. They don't realize there are other things out there for other technology such as Web 2.0 that could be used such as Voice thread and Edmodo, Story Bird, I can't think of all of them.

Part of my successes includes teaching students to get engaged with technology and they are able to use it to learn and present knowledge. Like the idea that I teach them to create movies. The greatest success is Edmodo, in that I get things graded and can give quick feedback. I like the way to blog and have higher level discussions. I wish they had more interest in doing assignments at home. I also integrate other subjects in my classroom, math, science, language arts, and social studies, so I believe I impact them throughout the school.

The most support I've gotten from administration is them coming in observing and then giving you feedback on how to improve instruction. I've also gotten support from professional development courses.

I want to continue what I'm doing now and improve what I'm doing now because it's the wave of the future. I want to let students know they can get paid more in that subject area than anyplace else in a career that makes a lot more than I do.

To make it work, it all takes planning, daily planning and learning from my mistakes. When a lesson doesn't work, I make improvements. I watch the kids and help them individually, and read more about ways to teach. The more I understand the software, the more I can teach it better. So I realize that I have to understand it myself by taking training courses.

Structural Description of Joanne's Experiences

Since Joanne's position is that she teaches computer science, her technology knowledge and content knowledge blend together. She received a good background in college courses in technology skills, and applied that knowledge to help her learn the new Web 2.0 tools. The fact that she had planned on teaching government, but got hired as a computer science teacher was challenging. In addition, the county did not have a formal curriculum for computer science or a supervisor to assist her in making the transition from social studies to computer science. She therefore felt that she had to create her own curriculum. Her natural ability to be creative and adapt to circumstances, aided her in that task.

The challenge for Joanne has been adapting her pedagogical knowledge to the technology knowledge and content knowledge. While she was originally a project based

teacher, the feedback from her principal and other evaluators was that they wanted to see a more traditional type of lessons complete with written lesson plans showing the steps in each lesson. The fact that the county does not have a formal curriculum for computer science or computer literacy, as it was formerly called, made her job very difficult. In addition, because she is in a high needs school, the students come to her with varying abilities which made her job even more difficult. However, she is a very bright teacher, and once given direction from her administration, was able to really pull her pedagogy together.

For her, the use of the Web 2.0 tools was a natural fit. The tools helped her and her students become more organized by putting files in an easy to get to environment, and giving her a virtual space from which to grade them and give them feedback in a timely manner. By using the online quizzes, she was able to assess their abilities, and adapt her pedagogy to meet their needs. Her classroom management skills helped her become aware of each individual student's needs. In addition, encouraging her students to work from home with the Web 2.0 tools fits into her administrations' wishes to extend learning to the home. She also liked the higher level thinking the online discussions encouraged in her students. She has a strong desire to show her high needs students that they have the ability to get into and succeed in the computer science field.

It is interesting that she pulled her students away from the computer to teach them about computers. She states that students tend to want to do other things, like play games on the computer and it distracts them. Therefore, she pulls them away to teach them concepts, and then lets them go back and do it on their own. She models her teaching style after what she described her experiences in college were like.

Bringing her TPACK together takes extensive planning and self-evaluation on her part. If something doesn't work, she re-evaluates and tries something new. The fact that she is a special area teacher and can teach the same curriculum the next quarter helps her adapt and fine tune the curriculum for her students.

Appendix L: Textural & Structural Descriptions for Nancy

Textural Description of Nancy's Experiences

My technology training is extensive. I learned as a senior in high school, and then in college I took a math concentration and Logo with integrated curriculum as an elective in the concentration. I got my masters in technology after my first year of teaching. I loved technology and what it could do for students. This was back when the big laser disks were out and CDs had just come out. These were not in classrooms yet.

In the classroom, I have used an Apple IIe's lab and a student computer in the classroom. Magic slate was the word processing program in the classroom. I used it and presented at the state level technology conference. All my grad work was on Apple IIe but when I opened a new school, we had the first Apple PCs. The principal supported the use of technology. We had to sign out lab times. We also had one computer in the classroom and one in the pod. We did a lot of stations and follow up work, using the computer for reviews for activities. Or I would rotate the students into the station on the one computer. With writing, we used to do the newsletter for the month, and the things they learned that day. We created flip books and books on the computers with new endings that we'd print out and have the class books. The one computer had DOS on it and didn't have windows for a while. I sometimes brought the students up for small group with no big projector, so the kids would sit around it. Then I hooked my computer to the TV as whole group or small group with the TV and computer. I started to put plans and goals on the TV when you first were able to do it depending on the supervisor or principal. Eventually, I did start doing some of that to start teaching with links and things,

so it was all set up as you were teaching your curriculum. Then they started to put TVs in other schools. I did a lot of one computer in the classroom training of other teachers in all subject areas.

Since I teach computer science, I'd say my content knowledge is pretty deep. However, I am always learning new things, but don't have extra seconds to learn it right away. This delay may be due to family or work. Sometimes I feel I'm behind. Sometimes it's frustrating because I've learned something at home but it's not open at school. In other words, I have a wealth of knowledge, but I'm a believer there is more out there to learn. I learn from kids, too, as they have more time to be on it.

My main training on Web 2.0 was the Web 2.0 course using Moodle. We used forums, wrote up activities, shared lessons, and responded to others. We had to create lessons to share. In addition, I've taken the mini workshops or learned things at a conference session and then self-taught myself other tools. Taking the Web 2.0 class allowed me the time to check into some of them. At workshops or conferences it allowed me to see some, and then I could decide which ones to use. Also, it took not just time to learn the tools but to adapt it to the content. My progress depended on my time frame to allow me to enhance them for the classroom. It's something I have to keep up with and I am always looking for new things. To do this I attend conferences, read articles, collaborate and brainstorm with others and then adjust it to fit my classroom.

My teaching strategies include some of the things I do. The kids come in and log in and go to Edline. All my handouts are on Edline. So they get their work and know what they are doing. This way they can get it from home, it's in the announcements or news. During this united arts rotation, I use Edline to teach everything. They like the

hands on because if they can see it so they can do it. I do model some things but we do a variety of activities because not all learning styles are covered in one approach. Their warm up activity may be typing or finishing an assignment or one geared to that lesson. Then we go over the lesson so they know the outcome for the day. At this point, I may be modeling, but sometimes kids are modeling. We use the interactive whiteboard, so they can model up there and share what they know. They have their activity which depends on the unit. There are some have direction sheets that say here's what your output will be. If it is group work, they may be in groups depending on the activity. There are evaluations at the end, a kind of closure asking what did we learn or where do we stand at the end of class, or do we need more time. We create a gallery walk of student work to hang outside the classroom or share up on the projector if they give permission.

My classroom management consists of having the expectations posted in the room and on Edline. They come in and get started. We use questions marks on the side of the computer attached with Velcro. If they have questions, they flip up the question mark. If I'm helping someone, sometimes a peer helper will help them. If they are finished and think they are finished and have checked the rubric, they can type or check the folder with activities to do. They can create the enhancements and all kinds of extra credit. If they can't follow classroom expectations, they are given a warning and next step is that they have a behavior contract. I don't have to get very far on having to use them. I'm tough on them treating the equipment correctly. I tell them to treat it as a prized possession. All these types of things help with creating a positive atmosphere.

Some of the Web 2.0 tools I use are cartoon creator and the avatars you create so as not to give away your identity. They create those for Xbox and Wii, so they can see

how that translates. We use Diigo as a storage area to share bookmarks for their research. We also started using wikis for Digital World unit for 8th graders for web evaluations. They go to the wiki and it guides them through the different pages they are assigned to by last name. The web links are there and directions on going to the wiki section for discussing. However, they could not respond directly to that person, and had to scroll through 100 responses to see their response. In a way, it's a pain to match the responses to them. Some teacher in 7th grade had used it, but they had different logins. Edmodo was used to reflect on intellectual property and fair use. An activity with a quick discussion. They could use the same login even in high school, they just need to know the class number to join.

Learning activities I use include think, pair, and share when responding. I have activities called the screen name game to match screen names to a description of the person who created it. We discuss how to tell if it's a safe screen name. To do the activity they get these cards and they are up and about, they are not always in their seat they exchange computers and look at student work and respond to it. We also do research and learn how to do citations with the citation machine. I teach how to use Flickr and cite images. We talk about fair use and copyright.

So my knowledge of content has impacted the decisions of what to use in the classroom. I have to make sure it has things I can use for it. For example, if you are doing something on cyber bullying and it just has background on earth pictures, that's not going to help. I have to look at the content I'm teaching and the tools the kids can use, asking whether they can create it on their own. Then asking what I can do to help the kids be successful, and is it really effective.

Some of the challenges were that in the past, having one computer in the classroom is never enough for me. I could gear activities so you rotate them in and out to be sure all students had completed the activities but it was a challenge to figure it out. Now having updated computer systems is a help because back then the refresh only happened every 6 to 7 years. If you wanted to use new things, you couldn't always and having someone fix it was a challenge.

The current challenges center around the time of day, and that some things are still locked, and the network traffic. The last period has trouble getting to things because other people are on or downloading. Sometimes when things freeze, and a kid has to start over, or when a login worked the day before and they changed a setting at the central office, and now it doesn't work, they can hinder you. And you have to think through whether to put it on hold, keep going in a different manner, or scratch it, or go forward in a different format. Or if kids don't follow the guidelines, like netiquette, they can ruin it for everyone else. But the biggest challenge for me is finding the time to play with the tools to figure out how to be successful with them.

Another challenge is getting other teachers to buy into using technology when it is harder at first to understand it or organize it. My comment was always take small steps rather than giant steps and use your kids as a resource to help you because they sometimes know more than the teacher does. In addition, once they have bought into using technology, help them understand that technology is not every minute of the day. There are some things better without technology. How do you help them to decide whether it enhances or drags you down?

So why use the tools? There is a paradigm shift going on that's here to stay. How can we use it effectively and be successful and not have it wearing you down? The kids were born with it, they are the digital natives. It motivates them, they get tired of pencil and paper and they can edit quicker on line. Kids are willing to write and the quality is better because they can edit quickly. They can go back to their own post and respond to others. They can do it in the classroom, and across the state, globe, and it has even opened up different cultures to them.

Web 2.0 changes pedagogy because it is easier for them to edit and revamp. We can discuss a little bit quicker and easier because you can see the responses right there, and I can bring up them easier and show them as whole class. Right off the bat, response is more immediate. Rather than me looking at it, highlighting it, and printing, putting it in a word document and putting it on the screen, you are moving forward with your lesson more quickly.

As for student learning changing, if you get to the point and are able to have more than one, they can choose their tools. They can really pick what may work the best. They are learning skills that can carry them over for life long skills, whether for getting a job, or job market, or continue their technology. In addition, it enhances ways to store information in order to collaborate. If they wish to do it at home, they can get on wiki at home, and it can become part of their social network as well.

Putting it all together involves evaluating and revamping things, if I don't like what it's doing in one Web 2.0 tool, I can change up to another. I also ask the kids if it was easy to use and how they liked it. I look at their feedback. They will tell you whether it was worth it or whether they would rather use paper and pencil. I look at my

outcomes and goals, and then look at technology to see if it can enhance it and make it current. Technology is a way of life. It's continually changing every second but it's not going away. It is our students' life, so we need to be able to teach them how to use it properly and effectively. The same with teachers, when it comes to integrating, they know their content but need help to integrate it. Technology is awesome if used properly.

Structural Description of Nancy's Experiences

Nancy's technology knowledge and content knowledge are intertwined as well, since she is another computer science teacher. Her background training in technology is extensive. Not only did she start using technology in high school and college, but she went back for a Master's degree in the Educational Technology field early in her career. Because of this background at a time when technology was just getting off the ground in the district, she became first a trainer of teachers, and then one of the district technology coordinators. In that position, she was instrumental in getting the district to refresh computers on a more regular basis, and deliver the internet into classrooms. She has been a presenter at state and national conferences on learning activities she had done with students and with teachers, and the changes she's helped to occur at the district level. In addition, she interfaced on a regular basis with state level Educational Technology constituents. She keeps in contact with those constituents which keeps her knowledgeable in the field. She left that position due to a serious injury, and when she came back she slid into a middle school classroom position teaching computer science.

Her pedagogical knowledge is strong as well. One of the focuses of the program she was teaching to teachers was to blend the technology with their content and curriculum. As a current middle school teacher, she adheres to that philosophy as well.

With teaching as a special area teacher, she sees two classes of each grade level student daily. So if a lesson does not work in the morning class, she can tweak it for the afternoon class. In addition, she will teach the same curriculum to 3 more groups of students during the year as they rotate through the quarters. So units and lessons can be enhanced further for each group of students. The variety of learning activities and technology tools she uses on a regular basis are a testament to the strength of her TPACK.

Appendix M: Composite Descriptions and Synthesis

Composite Textural Description

Technology skills were obtained in several ways by the participants. For several participants training began in formal programs either in high school or college, while some took courses offered by the district. Other participants had graduate level courses or attained Master's degrees in technology. Two participants felt that they were self-taught or had "hit or miss" on the job training. No matter how much formal training was attained or how extensive that training was, the majority of participants spent additional time researching, exploring and learning more basic technology on their own. Their training on the Web 2.0 tools took a similar path with some receiving formal training either in a graduate class or district in-service. However, all of the participants spent more time searching for the tools or how to use them, exploring or "playing" with the tools, and learning the tools themselves. Even the two computer science teachers, whose content is teaching technology, have needed time to explore technology, and wish they had more time to focus on new technologies as they change. Several training scenarios were shared by the participants, but all mentioned that no matter what the type of training was, they still needed time after the training to apply what they had learned and to adapt it for use in their classroom.

Using technology in the classroom entailed a similar learning curve to their learning curve for technology. Using software such as the Microsoft Office package, and using equipment such as laptops, LCDs, projection systems, and later whiteboards was the start of each of the participants' experiences. However, their learning didn't stop

there. Each of the participants spent time and energy of their own learning new and different technology. Their exploration may have begun due to an article they read, or a course they were taking, or teaching (Renee), that peaked their interest in learning more. Another resource utilized by almost all the participants was their colleagues. The colleagues who helped in planning the activities using technology were teammates, mentor teachers, information technology support persons, or an integration specialist. Teammates shared resources with each other, such as a PowerPoint or links to websites or online tools that particularly fit their curriculum. The mentor teacher helped in the planning process and helped to locate materials for projects or gather data on the effectiveness of some of the tools. The integration specialist not only guided the teachers' learning experience with the tools, but also created help sheets for the teacher and her students to utilize while working on projects, so the students could manage the technology by reading directions if they got lost or forgot a step.

Web 2.0 tools were chosen for many different reasons, but in most cases because it enhanced instruction in some way. For example, the language arts teacher (Renee) chose Animoto for student use to be able to create characters to demonstrate the mood, setting, and author's purpose of a story, thus making stories "come alive" for the students and their peers. She also chose Voki because it helped the students see the big idea of a story by creating an avatar complete with backgrounds and costumes. In addition, students are practicing their presentation skills when they share their products with their peers. Janece, the music teacher, used Voki in the same way with students in the after school program.

The social studies teacher (Debby) used Edmodo to get to the big idea of a picture or a primary document by asking the students to discuss online what they were seeing in the picture. The music teacher (Janece) used Edmodo and Wallwisher for gauging student opinions about music from different time periods. In addition, she utilized the tools to differentiate learning by letting students learn at their own pace on projects, but then sharing what they learned in a Wallwisher or poll as a closure for the lesson. Both the music teacher and a computer science teacher (Joanne) utilized the online tools for quizzing students on concepts learned in the lessons. The music teacher noted that students seemed more relaxed and less anxious taking tests online, and has asked the mentor teacher to help her gather data on the effectiveness of that method next year.

The two science teachers (Teresa and Lisa), have both used the tools to have students dig deeper into concepts. Teresa encouraged the students to validate their opinions about earthquakes with their peers in the Edmodo online environment, and students had to find facts online to defend their opinions. Lisa used Prezi and podcasts to teach difficult concepts. She felt that the tools “piecemealed” the information for them and because they were online the students could go back to them if they got confused or forgot something when studying at home.

The two computer science teachers (Nancy and Joanne) used quite a variety of Web 2.0 tools, and for differing reasons. Joanne concentrated on tools that helped to organize herself and her students, including using the quizzing and grading options in Edmodo and Kia. In addition, she used Voice Thread for uploading projects. Nancy on the other hand, used a wiki for students to explore their digital citizenship, cartoon creator and avatar maker for creating their online presence, and citation machine for citing

sources. Both teachers expressed the need for students to be able to learn Web 2.0 tools for their future use in classes as they progress through college or careers.

Getting to the point to be able to use all these tools didn't come without challenges along the way. Each participant had struggled in the past with technology in some way, but challenges with Web 2.0 were different in nature than the previous challenges. Several participants acknowledged that limited access still exists. For several teachers access to actual computers was the challenge. Having one to five computers in the classroom allowed for use of the tools, but made the pedagogy challenging in that the teachers had to use different pedagogies to utilize the computers in groups. The teachers managed it by creating stations in the room where students could work as a group (Renee) around the computer or rotate through different stations (Janece). The teachers who did not have the one to five computers in the classroom had challenges with signing up for the lab to take the whole class. Those teachers mentioned that standardized testing created part of this challenge as the labs were open on a limited basis during testing. In addition, another teacher (Debby) mentioned that sometimes her pedagogy was challenged because of the level of her students. She'd book the lab for a certain day, but because the pacing of her students' learning varied, she wasn't always guaranteed that they'd be ready to use the computers on the day that she booked them.

Several teachers mentioned that some of the technical challenges experienced during their early days of technology use, still exist today but look a little different. For example, some of the tools still don't work the way they are supposed to, or are not available with the curriculum (Lisa) that they are supposed to teach. Janece mentioned that certain types of music files would not work, and access to the types of music she

needs to teach are not available. With those that use the tools regularly (Nancy and Joanne) some of the issues of the internet being slow or things freezing sound just like the challenges Debby had earlier when the Media Center computers would freeze if they all got on at the same time. In addition, all of the participants mentioned that one of the reasons they had to “explore” the tools was because it was never guaranteed that a tool they found at home would work when they got to school because of being locked out through the firewall. A unique challenge mentioned by Renee, but probably felt by all the participants, was the need to keep track of different logins and passwords for all the tools, and which computer she had logged into for which tool. In addition, she was unsure of the districts’ policies on using some of the tools, or who to go to for answers about her questions. Lisa echoed the concern about the districts’ policies because she was unaware of the training classes being offered by the district.

Despite all the challenges, the participants had solid reasons for wanting to use the tools. One main reason mentioned by several participants was that it changed their teaching or their students’ learning. Janece used the tools to “intentionally talk less and ask more questions”. The students can experience the lesson through Story Bird or Prezi, or an interactive Power Point, and then she asks them questions about what they observed. So instead of lecturing and telling them the information, she was asking them to explain their thinking. Teresa liked that “... it changed pedagogy from teacher centered to being a facilitator as a guide in the right direction and watching what they are doing. They are more engaged in finding their own information. Sometimes they find the wrong information, and you have to step back and rather than saying that’s wrong guide

them to other websites or to look at what other kids are blogging and guiding them to rethinking their thinking which is difficult to do”.

Renee also mentioned that the tools were great for building awareness for the content and expanding their brains to think deeply and represent their ideas in new and interesting ways. Debby mentioned that the Edmodo responses helped her see where her students understanding of concepts stood, so she could point them to things they were missing, while Lisa appreciated that Prezi allowed the students to piecemeal the information for better understanding.

Another main reason given for using the tools was that it gave the students tools to use in their future education and careers. This sentiment was expressed not only by the two computer science teachers, but also the language arts teacher and the music teacher. The music teacher stated that she wanted to delve into the tools more because music is now being created with technology so that changes her field. She'd like to be able to keep up with and teach her students about those changes, so they'd be able to thrive in this new world.

In order to pull the technology together with the pedagogy, the teachers admitted that it takes a lot of planning and knowing their content deeply. The more familiar they are with their content, the more they can see where the tools can enhance the learning. Renee looks at the big ideas she wants the students to grasp and looks for tools that allow them to do that. Several other teachers mentioned looking at the content, getting their outcomes, and planning the strategies to meet those outcomes. In addition, evaluating how things were working, and revamping or “tweaking” the activities to make them work better, was a constant theme throughout the interviews. As Janece so aptly stated

that sums it up, “I feel all my classroom activities are successful. Things that don’t work, I don’t use. It’s trial and error. Things that work I keep and adapt for different groups. There have been some that work with one group and not another but the tools lend the flexibility to meet the individual needs of students and are catered to the students in the class”.

Composite Structural Description

The basic technology knowledge of the participants ranged from using the tools in high school or college, to obtaining Master’s degrees in Technology in Education. There were four different training formats on Web 2.0 tools. One format was an online course complete with weekly assignments and developing lesson plans to use the tools then sharing ideas on a discussion board. Another format was a simple demonstration of a single tool at a faculty meeting, but no time for the teacher to play with the tool. The district also offered two hour workshops that introduced the tools and gave them time to work on something for use in the classroom while experienced teachers stood by to help them through their learning curve. The fourth scenario used by all participants at one time or another, involved self-teaching. Some learned about the tools from colleagues, magazine articles, or in a class, and then all practiced using the tools on their own. In all instances the teachers had to put effort into learning the tools.

The content knowledge for all participants was strong as well. Most of them at least had a Masters’ degree in their content, and some had been involved in their field for many years. Some had grown up learning the field through childhood experiences, while another had spent 15 years in her field working as a researcher and teaching about that field at a college. However, most agreed that no matter how deep their content

knowledge was they could always learn more even if in a different concentration in their field. All participants stated that they continued to attend training or classes and kept up with their field.

Pedagogical knowledge varied among the participants but not greatly. Although one participant was a second year teacher with her pedagogy still in the process of being developed, she also had support from the mentor teacher, her department chair, and the integration specialist that aided her in developing and fine tuning the pedagogy. Another participant was a researcher before a teacher, so was not as aware of pedagogy and what it was. However, her content knowledge was so strong that she instinctively seemed to do what her students needed without being able to identify it as pedagogy. The remainder of the participants had been teaching a number of years, and had fine-tuned their pedagogies before interacting with the Web 2.0 tools. This experience helped them recognize the potential of the tools, and adapt their pedagogy to take advantage of the benefits of the tools.

The blending of their technology knowledge, content knowledge, and pedagogical knowledge enable the participants to be willing to utilize Web 2.0 tools in the classroom. Their strengths enabled them to be successful in attempting new technologies and find the best uses for their students.

Edited Textural-structural Synthesis: Essence of the Experience

This textural-structural synthesis explains how the elements of the TPACK framework are the structure that supports the teachers' integration of Web 2.0 tools in their classroom as seen from the perspective of an individual researcher in a reflective

study of the phenomenon. It describes the essence of successful use of Web 2.0 tools as manifested through the teachers' voices.

The essence of the experience of the phenomenon centers around interrelated themes supported by technology knowledge, content knowledge, and pedagogical knowledge. Technology knowledge is dependent on their previous training, and supports how they handle challenges or utilize supports in the classroom. Content knowledge supports their decisions about materials, activities and tools, while pedagogical knowledge effects the changes in teaching and learning that occur when the tools are utilized. The elements essential to the phenomenon are described below.

Technological Knowledge: training, challenges and supports

Whether technology skills were obtained in formal programs in high school or college, or took the form of courses offered by the district, or were "hit or miss" on the job training, technology training was an underlying structure of the essence of this phenomenon. Additional personal time was spent by the participants researching, exploring or "playing" with and learning both basic technology and the Web 2.0 tools. Even the two computer science teachers, whose content is teaching technology, needed time to explore technology, and wished they had more time to focus on new technologies as technology changed. The additional time spent learning or exploring helped the participants overcome some of the technological challenges that came with adapting something new.

The technical challenges faced included such things as lack of access to computers, not enough outlets, sites locked by firewalls, slowness of the internet at certain times of the day, freezing computers, or software or online tools that would not

work for specific tasks. Another challenge facing teachers was access to the labs. Sometimes this was due to the fact that the labs were frequently unavailable due to extensive high stakes testing or intervention programs done in the labs. At other times it was due to the “planning when to get into the lab and [the] pacing of my lessons” did not match due to students needing more time to be ready for the lab.

The challenges specific to Web 2.0 tools involved keeping track of “all the tools, trying to keep passwords the same, keeping a record of all my and my students’ passwords, and which computers I registered which site on”. In addition, participants felt that more guidance was needed from the district on things like using wikis, “what are the policies of the system on the wiki? Can I be in another class’s wiki? How do I invite them into my wiki?” Even the computer science teachers wanted answers from the district on what skills they should be teaching, what objectives the district wanted them to cover, and how long units in computer science should be. In other words, there was no follow up person to approach for answers. Another participant felt that the training classes were not advertised very well, and wished that communication on such things could be improved.

Participants were able to overcome some of the challenges, not only due to the confidence they had built while getting the training mentioned above, but also by accessing other resources for help. They utilized help files to figure out the technical challenges. They also received support from their colleagues who had more experience, or from a mentor teacher, or integration specialist. Being able to handle the challenges enabled them to concentrate on their content knowledge and how the tools could help teach their specific content.

Content Knowledge: Decisions about materials or activities

Content knowledge is another underlying structure of the essence of this phenomenon. Content knowledge gave teachers the objectives to guide students in achieving mastery of their content. All of the participants in this study had a strong content background. Most of them had at least a Masters' degree in their content, and some had been involved in their field for many years. Some had grown up learning the field through childhood experiences, while one teacher had spent 15 years in her field working as a researcher and teaching about that field at a college. However, most agreed that no matter how deep their content knowledge was they could always learn more even if in a different concentration in their field. All participants stated that they continued to attend training or classes and kept up with their field.

Having a strong content knowledge enabled the participants to "... know where things might fit when I teach that section... I can plan ahead, and think, this would be a great discussion about this topic." Knowing the content enabled the participants to understand which concepts were best taught with the tools. For example, "...concepts in geology are easy to get them talking online, there is more info out there, that they can understand... where the information on weather is difficult to understand." Sometimes tools were chosen because they made students use their background content knowledge and "... put it into play to understand and respond to it". The tools were sometimes chosen even when they weren't "...for my content area, ... but I'm thinking it's important to have good presentation skills, if they can't play it they should have skills to be able to talk about it or write about it (music teacher) . " In addition, the tools gave the teachers a diverse set of tools to make teaching the subject more effective. However,

that diversity sometimes felt “...overwhelming when thinking about Web 2.0 tools... and when I talk about Web 2.0 when I’m sharing in department meetings, other teachers get overwhelmed, so I think simply I want them to learn something about each piece of text to bring the characters to life.”

Choosing the materials or Web 2.0 tools that were best for teaching their content is another aspect of this phenomenon. Some of the tools were suggested by the curriculum supervisor or in curriculum guides, while others were chosen by the participants. Some decisions on the tools were based on ease of use of the tools for what the students needed to do with the content. For example, one teacher said, “... with Wiki and Glogster, they were too big and not intuitive, and Wordle did not work well for what I wanted the students to do with text. When students typed in a significant portion of key text, only a few words were represented which didn’t accomplish the curriculum goal.” Some decisions were influenced by the fact that technology itself is changing their curriculum. As one teacher put it, “I’d like to lean more to technology because that’s how it [music] is created today.” Some choices were based on how the tools could be used to highlight parts of the content. For example, the use of Prezi in the science classroom to get the overall picture along with the elements, or in the social studies classroom to explore a picture in detail connected to an historical time period. While the choices for the computer education teachers centered on how to best teach 21st century skills. Once the tools are chosen to teach the content, the teacher then has to figure out how to improve teaching or learning with that tool.

Pedagogical knowledge as it supports changes in teaching and learning

Pedagogical knowledge is the third underlying structure of the essence of this phenomenon. It is the teachers' knowledge about how teaching and learning happens, and what strategies can enhance or hinder the learning.

Pedagogical knowledge varied among the participants but not greatly. Although one participant was a second year teacher with her pedagogy still in the process of being developed, she also had support from the mentor teacher, her department chair, and the integration specialist that aided her in developing and fine tuning the pedagogy. Another participant was a researcher before a teacher, so was not as aware of pedagogy and what it was. However, her content knowledge was so strong that she instinctively seemed to do what her students needed without being able to identify it as pedagogy. The remainder of the participants had been teaching a number of years, and had fine-tuned their pedagogies before interacting with the Web 2.0 tools. This experience helped them recognize the potential of the tools, and adapt their pedagogy to take advantage of the tools to improve teaching and learning.

The benefit of having strong pedagogical knowledge when it comes to integrating Web 2.0 tools into the classroom, is that of knowing how teaching and learning can change, and if that change is beneficial. For example, the explanation that "... each student had to look at the picture and respond to it, so they had to use their background knowledge in order to understand the picture and respond to it", reflects that the teacher is aware that she now has another tool for measuring the students' background knowledge. Another example is that creating an Animoto character to "bring characters to life... is a different way to express ideas in literature" makes students think in a deeper way about what they've learned. Deep thinking has to take place to find all the elements

to recreate the characters. Another teacher improved teaching by “...being able to present concepts to students without a lecture, by showinga lot of pictures based on nature, and then ask them what the songs will be about.... You don’t have to say it. They see it without you saying it... I use it so that I can talk less and the students are able to form ideas about the music before they listen to it.” That same teacher involved all the students she taught in that rotation in listening to the same songs and sharing words to describe the music, then “...using Wordle for musical analysis involve all the kids in the rotation..... they would list 10 words... then categorize by mood, tempo... and other musical elements.” This teacher was doing a type of “crowdsourcing”, which may be a 21st century learning skill. Another teacher was using Edmodo for storing and accessing files and folders which gave her students experience in another 21st century skill.

Another example of changing learning is that the tools can differentiate instruction for different types of learners. As one teacher stated “... what web 2.0 tools does for kids... it allows them to bring books to life, better than paper and pencil , gives them a way to be artistic even if they are not artistic”. The music teacher shared that the struggling students went through interactive PowerPoint at their own speed before they approached the other stations to give them the background for the more advanced skills. In addition she said, “...with Power Point they wanted to write paragraphs or copy and paste.. rather than using lots of text, it allows students use pictures to understand bigger ideas... they have been able to talk with interest and knowledge about their subject. That is helpful to them and me as I get to see what they know even if they don’t complete the whole projects. It helps the struggling readers.” The student interaction created by Web 2.0 tools supports hands- on learners as well as per another teacher. The computer

education teachers had to constantly make changes to their teaching to give their students guidance in the proper use of Web 2.0 tools as the tools became available.

Another evidence of teaching and learning changing expressed by several teachers is the concept of hearing from all students in the class. As one put it, “I think it was kind of ... all the kids had to respond...so I think it was better than being in the classroom where you only call on a few students.”

One teacher stated that the tools improved the teaching process “... because it is easier for them to edit and revamp... and we can discuss a little bit quicker and easier because you can see the responses right there, and I can bring up them easier and show them as a whole class. Right off the bat, response is more immediate versus me looking at it, highlighting it, and printing or putting it in a word document and putting it on the screen. Looking at web 2.0 reflections gives immediate responses right off the bat....you are moving forward with your lesson”. This easy editing and revamping can lead to more efficient teaching. Several teachers mentioned that they can revamp lessons more easily with the tools to make it better for the next class. In addition, one of the science teachers felt it improved her teaching “... because I’m less stressed. It’s more work up front planning it out and when reading all of their responses, but during classes when their leading to the information, they are more engaged because of the tools... and their learning tends to be better. They want to use it again.” The other science teacher felt that having the information online was a key component “...especially with science to give them something to think about and if you don’t see them for 2 days... they can have discussion board as a valid discussion, and rather than having to wait for 48 hours, they’ve already discussed it online.” Another teacher agreed with the concept that the

tools can extend the learning past the school day, but others expressed concern about the students having access after the school day.

Finally, as one teacher summarized, with Web 2.0 pedagogy can change "...from teacher centered to a facilitator as a guide on the side, to lead students in the right direction and watching what they are doing. They are more engaged in finding their own information... and when sometime they find the wrong information you have to step back and let them find information. They might find the wrong answer. And rather than saying that's wrong, guide them to other websites... or to what other kids are blogging, and guiding them to rethinking their thinking. That's hard to do."

At a first look, with all the challenges faced by the participants, one wonders why they bother working through them, but the reasoning for this becomes evident when looking at the changes in teaching and learning.

Appendix N: Sample Combined Codes for Theme of Adapted Pedagogy

HU: TeachersPerspectiveWeb2.0AtlasFile071512

Date/Time: 2012-07-16 00:00:04

Code: adapted pedagogy {9-0}

P 4: P2 2nd Interview .docx - 4:11 [Biggest barrier for using the ..] (46:46) (Super)

Codes: [adapted pedagogy - Families (2): Changes in teaching, Pedagogical Knowledge]

No memos

Biggest barrier for using the web 2.0 tools is the limited computers.. Can't do a whole group lesson.. where all are crating project at the same time.. Then requires me to have tools are a stations.. have stations and other options for those not on the computer.. Struggling kids are using the computer most because they have more time and a greater chance to get on the computer.. Have to balance structure and choices.. the lower kids need the structure and the flexibility.. Takes a lot of thinking and planning to accomplish those goals...

P 6: P3 2nd Interview .docx - 6:13 [Tried intentionally to talk le..] (107:107) (Super)

Codes: [adapted pedagogy - Families (2): Changes in teaching, Pedagogical Knowledge]

No memos

Tried intentionally to talk less and ask more questions.. the web 2.0 tools allow me to do that.. the way I use the tools.... In every case a question is posted.. Wallwisher or poll.. it's a question.. assignments or discussions on Edmodo.. story bird presentation I ask them questions.. It's helped me ask better questions.. and I work toward asking the students better questions.

P 6: P3 2nd Interview .docx - 6:14 [They are all successful... thing..] (111:111) (Super)

Codes: [adapted pedagogy - Families (2): Changes in teaching, Pedagogical Knowledge] [Success - Family: Success]

[Why use 2.0? - Families (2): Changes in learning, Web 2.0 tools]

No memos

They are all successful... things that don't work... don't use.. trial and error.. things that work I keep .. and adapt.. for different groups.. there have been some that work with one group and not another... the tools lend the flexibility to meet the individual needs of students and are catered to the students in the class.. the why.. the voki....what is available for use doesn't fit my classroom. . and another site .. avatars.. all the avatars are white.. and I won't bring that into the class because I want them to feel valued..

P 6: P3 2nd Interview .docx - 6:15 [The ones I keep talk about... an..] (115:115) (Super)

Codes: [adapted pedagogy - Families (2): Changes in teaching, Pedagogical Knowledge] [adapting Web 2.0 to content -

Family: Web 2.0 tools]

No memos

The ones I keep talk about... any tool that I mention I'm using has been easily adaptable.. or I'm not using it.

P 8: P4 2nd Interview.docx - 8:11 [Style of teaching.. I'm strict..] (62:62) (Super)

Codes: [adapted pedagogy - Families (2): Changes in teaching, Pedagogical Knowledge]

No memos

Style of teaching.. I'm stricter with them in the computer lab.... I know there's Tendency to go off somewhere else and I really have to keep an eye on them.

P10: P8 2nd Interview .docx - 10:12 [(Reasked question)... web 2.0 ch..] (45:45) (Super)

Codes: [adapted pedagogy - Families (2): Changes in teaching, Pedagogical Knowledge]

No memos

(Reasked question)... web 2.0 changes pedagogy ... because it is easier for them to edit and revamp... and we can discuss a little bit quicker and easier because you can see the responses right there, and I can bring up them easier and show them as whole class. Right off the bat, response is more immediate... vs me looking at it, highlighting it, and printing, putting it in a word document and putting it on the screen. Looking at a web 2.0 reflection, gives immediate response right off the bat....you are moving forward with your lesson.. I still change things form class to class... For example, with edline, we responded to it one way... we looked at it, and it didn't clarify.. redited in 2 seconds....I rewrote it for the ... and for this class.. Makes it more visible for the kids..

P11: P5 2nd Interview D.docx - 11:7 [web 2.0 you are changing pedag..] (50:50) (Super)

Codes: [adapted pedagogy - Families (2): Changes in teaching, Pedagogical Knowledge] [Change in Learning - Families (2): Changes in learning, Pedagogical Knowledge] [enhancing teaching strategy - Families (2): Changes in teaching, Pedagogical Knowledge]

No memos

web 2.0 you are changing pedagogy from teacher centered to facilitator to guide in the right direction and watching what they are doing.. not teaching or modeling allowed or even doing a cookie cutter lab you have to. They are more engaged in finding their own information.. sometime they find the wrong information you have . step back and let them find information.. they might find the wrong answer. And rather than saying that's wrong guide them to other websites .. or what other kids blogging.. and guiding them to rethinking their thinking.. that's hard to do..

P15: P7 2nd Interview .docx - 15:14 [All my instructions are in edm..] (38:38) (Super)

Codes: [adapted pedagogy - Families (2): Changes in teaching, Pedagogical Knowledge]

No memos

All my instructions are in edmodo.. assignments, grading.. have a hard time getting trying to get all my files into edmodo is challenging.. way to go to get it all in one area.. then I get afraid if Edmodo will it always be free.. saving in two locations..

P15: P7 2nd Interview .docx - 15:13 [I use the poll question.. for ..] (38:38) (Super)

Codes: [adapted pedagogy - Families (2): Changes in teaching, Pedagogical Knowledge]

No memos

I use the poll question.. for the questions of the day... I can give quick questions.. assignment turn in.. grade them and try to give them feedback thru grading.. more feedback..open a powerpoint .. and give them feedback..

Appendix O: Sample Combined Codes For One Participant

All (21) quotations from primary document: P 5: P3 1st Interview.docx

HU: TeachersPerspectiveWeb2.0AtlasFile070212

Date/Time: 2012-07-06 06:45:19

P 5: P3 1st Interview.docx - 5:1 [undergrad... laptops, office, an..] (13:13) (Super)

Codes: [Formal classes - Families (2): Technology Knowledge, Training]

No memos

undergrad... laptops, office, and other technology tools and portfolio.. and all of the google docs and application forms for sharing in graduate school

P 5: P3 1st Interview.docx - 5:2 [presentation s like powerpoint..] (17:17) (Super)

Codes: [First Use of computer - Families (2): Technology Knowledge, Training]

No memos

presentation s like powerpoint on music in different countries, and composers in other eras.. used powerpoint

P 5: P3 1st Interview.docx - 5:3 [Lack of accessibility.. childr..] (21:22) (Super)

Codes: [Challenges with technology - Families (2): Challenges, Technology Knowledge]

No memos

Lack of accessibility.. children can't get to it.. we use mp3 they cannot get to ... some inappropriate.. we used free play music.. doesn't have styles they are required to research.. not allowed download it ... don't have a program for shortening to the legal limit of what they can use no ... software to clip music pieces to the legal limits..

Citations for websites.... Ellen helped with that

P 5: P3 1st Interview.docx - 5:4 [used a better program... used ph..] (24:24) (Super)

Codes: [Success - Family: Success]

No memos

used a better program... used photo story to listen to it, analyze it and create... using higher level thinking skills then can create their own music.. create own ... let's me understand that they get the key concepts. And have the understanding of the basic concepts of tempo, tone, genre, style

P 5: P3 1st Interview.docx - 5:5 ['t like wikis... confusing for m..] (28:28) (Super)

Codes: [Challenges with web 2.0 - Families (3): Challenges, Decisions about materials, Web 2.0 tools]

No memos

't like wikis... confusing for me and students, they move things around and don't quite know what they do...

P 5: P3 1st Interview.docx - 5:6 [Edmodo is a great tool for gau..] (28:30) (Super)

Codes: [enhancing teaching strategy - Families (2): Changes in teaching, Pedagogical Knowledge]

No memos

Edmodo is a great tool for gauging opinions on things we've covered in the unit, what about it.. polls about .. do you think.... Use terms of the times.. like chant... can post photo stories to critique with other classmates... wall wisher...I use it for closure.... For a variety of exercises... for the project.. which composer did you choose and why.. give an interesting fact.. let them brainstorming on a wider scale... 6th graders on countries.. same thing... for them to get to know each other in a different way and why

they are interested... blabberize.. make them talk... it was exciting seeing a nuns story bird and I've used voki with archievers (after school program) .. had to create a character for their books... create a script for their character from books.. how characters see themselves and other characters see them, . and what clues are in the text... story bird to introduce a song to introduce a culture.. pretty way with art work to combine music and art... 6th grade.. music of Japan which is based on nature found a lot of pictures based on nature, and then ask them what the songs will be about.. ... don't have to say it.. they see it without you saying it..

Use wordle for musical analysis involve all the kids in the rotation.... listen to the song ... they list 10 words... categorize by 5 mood, tempo,,, Etc.. put them all together into wordle...input them into the wordle, and see that chants come out as boring 20 times. Students input during stations.. I use running word document.. closure talk about some words are ... we can talk about boring why? To whom? ... to composer.. to you as the audience.. shows which means the most.. use computers in stations.. has a mini lab with 5 computers in the classroom..

Quizzes in Edmodo... Next year the mentor teacher will collect data on paper tests versus online in Edmodo.. less stressed... only issue is with the listening portion.. so they can all see it.... Can't get You Tube on their computers because codecs aren't on there.

Documentation of listening skills

P 5: P3 1st Interview.docx - 5:7 [Who isn't interested in music.....] (38:38) (Super)

Codes: [Content Interest - Family: Content Knowledge]

No memos

Who isn't interested in music... my gradparents sang opera.. sang in church choirs.. got an undergrad in music Went to get masters.. then music education.. liked education more than music

P 5: P3 1st Interview.docx - 5:8 [I would think it is.. but it i..] (44:44) (Super)

Codes: [Deep Knowledge - Family: Content Knowledge]

No memos

I would think it is.. but it is the oldest discipline in the history of the world its considered more than science .. there is so much to know about it.. but if you compare me to a Jazz musician.. no.. or by someone specializing in early music just scratching the surface... original violins and cellos from 1300.... So much to know.. no one can have a deep knowledge. Maybe only in one particular area.

P 5: P3 1st Interview.docx - 5:9 [variety of methodologies focus..] (54:54) (Super)

Codes: [teaching philosophy - Family: Changes in teaching]

No memos

variety of methodologies focus on theories.. notation and reading music.. I use the orff - schulwerk methodology that combines movement with poetry in the creation of music especially in studying world music because it has a more organic approach in creating music.

P 5: P3 1st Interview.docx - 5:10 [I'd like to lean more toward t..] (54:54) (Super)

Codes: [Decisions about materials - Families (2): Decisions about materials, Pedagogical Knowledge] [Why use 2.0? - Families (2): Changes in learning, Web 2.0 tools]

No memos

I'd like to lean more toward technology ... esp 6th grade because it has an organic approach... lean more to technology because that's how its created today.. that's why I like to incorporate more technology tools.

P 5: P3 1st Interview.docx - 5:11 [Most people wouldn't even say ..] (59:59) (Super)

Codes: [TK and CK - Family: Content Knowledge]

No memos

Most people wouldn't even say this technology is for my content area.. especially with web 2.0 tools but I thinking it's important to have good presentation skills , if they can play it they should have skills be able to talk about it and write about it.. I use other technology tools that are more tools focused on my content.. like smart music which has accompaniment ... but not web 2.0 tools.. cameras for self and peer evaluations.

P 5: P3 1st Interview.docx - 5:12 [Students do drill that involve..] (68:68) (Super)

Codes: [Typical Lesson - Family: Pedagogical Knowledge]

No memos

Students do drill that involves reading music notes for pitch.. play recorders.. for rhythm and pitch.. entering a new unit.. mini- lecture with powerpoint, or story bird .. for the history wise.. stations on a computer.. listening or music A write music games.. differentiate for band students, and lower students.. rotate and play instruments, and book work.. and Jane's powerpoints.. interactive ones.. go through on their own.. with pictures click on to learn about topic.. have visuals in front of them.. struggling students do the power points first.. .. closure.. sometimes written.. sometimes on wallwisher.. just something they have to get done throughout period

P 5: P3 1st Interview.docx - 5:13 [It's a very quick paced.. if t..] (72:72) (Super)

Codes: [Classroom Management - Family: Pedagogical Knowledge]

No memos

It's a very quick paced.. if they don't do what they are supposed to do.. they get behind and I won't help them again what they missed ... quick .. students in lunch detention.. then after school detention..

P 5: P3 1st Interview.docx - 5:14 [That's made it more difficult ..] (78:79) (Super)

Codes: [Classroom Management change with Web 2.0? - Families (3): Changes in teaching, Pedagogical Knowledge, Web 2.0 tools]

No memos

That's made it more difficult because of number of computers.. logistically.. when I use the tools doesn't

Unless you've taught them how to use them ahead of time.. space, access issues?

P 5: P3 1st Interview.docx - 5:15 [Students do drill that involve..] (68:68) (Super)

Codes: [learning activity - Families (3): Changes in learning, Decisions about materials, Pedagogical Knowledge]

No memos

Students do drill that involves reading music notes for pitch.. play recorders.. for rhythm and pitch.. entering a new unit.. mini- lecture with powerpoint, or story bird .. for the history wise.. stations on a computer.. listening or music A write music games.. differentiate for band students, and lower students.. rotate and play instruments, and book work.. and Jane's powerpoints.. interactive ones.. go through on their own.. with pictures click on to learn about topic.. have visuals in front of them.. struggling students do the power points first.. .. closure.. sometimes written.. sometimes on wallwisher.. just something they have to get done throughout period.

P 5: P3 1st Interview.docx - 5:16 [- Tell me about your training ..] (100:104) (Super)

Codes: [training in Web 2.0 - Family: Training]

No memos

- Tell me about your training with Web 2.0 tools. (TK)
- **Where did this training take place?**

In session things... learned voki in-service... Edmodo.... I've taken about 15 - 20 tech courses in the last year...

P 5: P3 1st Interview.docx - 5:17 [Workshops ... mini workshops.. f..] (109:109) (Super)

Codes: [Format of class - Families (2): Technology Knowledge, Training]

No memos

Workshops ... mini workshops.. for pay couple hour worksho

P 5: P3 1st Interview.docx - 5:18 [See above codecs not there.. s..] (113:113) (Super)

Codes: [challenges with technology - Families (2): Challenges, Technology Knowledge]

No memos

See above codecs not there.. software to clip music

P 5: P3 1st Interview.docx - 5:19 [omputers in the classroom.. I ..] (118:118) (Super)

Codes: [Technological Supports for use of web 2.0 - Families (3): Decisions about materials, Supports, Web 2.0 tools]

No memos

computers in the classroom.. I couldn't use Smart music.. music ace.. a games based learning for music... mic with usb.. can speak into the computers.. whiteboard would be nice .. headphones with mics...

P 5: P3 1st Interview.docx - 5:20 [Integration specialist, depart..] (123:123) (Super)

Codes: [supports - administrative - Family: Supports]

No memos

Integration specialist, department chair .. computer ed teacher.... Tech staff mentor

P 5: P3 1st Interview.docx - 5:21 [Constantly reevaluating and ch..] (131:131) (Super)

Codes: [supports - instructional - Family: Supports]

No memos

Constantly reevaluating and changing..giving very detailed instructions on the tools from the integration specialist .. lets me spend time on content.. makes student responsible for learning and working way through technology with Integration Specialists' instructions..

All (18) quotations from primary document: P 6: P3 2nd Interview .docx

HU: TeachersPerspectiveWeb2.0AtlasFile070212

Date/Time: 2012-07-06 06:46:03

P 6: P3 2nd Interview .docx - 6:1 [Tell me about your pedagogy. (..) (11:16) (Super)

Codes: [learning activity - Families (3): Changes in learning, Decisions about materials, Pedagogical Knowledge] [Typical Lesson - Family: Pedagogical Knowledge]

No memos

Tell me about your pedagogy. (PK)

○ **What is a typical lesson like in your classroom?**

Students do a drill that involves reading music notes for pitch.. they play recorders and I'm looking for rhythm and pitch.. When I'm entering a new unit I use a mini- lecture with powerpoint, or story bird for giving the history then they go to stations on a computer.. stations on listening to or to write music A write music or play music games.. I differentiate for band students, and lower students giving different lessons.. rotate and play instruments, and book work.. and Jane's powerpoints.. interactive ones.. go through on their own.. with pictures click on to learn about topic.. struggling students do the power points first.. .. closure.. sometimes written.. sometimes on wallwisher.. just something they have to get done throughout period.

When they are at their stations, they rarely write music, they are listening , they play music notation games, or they listen to music in different places, history or time periods.

P 6: P3 2nd Interview .docx - 6:2 [That's made it more difficult ..] (29:29) (Super)

Codes: [Classroom Management change with Web 2.0? - Families (3): Changes in teaching, Pedagogical Knowledge, Web 2.0 tools]

No memos

That's made it more difficult because of number of computers.. logistically.. when I use the tools doesn't

P 6: P3 2nd Interview .docx - 6:3 [Tell me about your pedagogy. (..) (11:16) (Super)

Codes: [Classroom Management change with Web 2.0? - Families (3): Changes in teaching, Pedagogical Knowledge, Web 2.0 tools]

No memos

Tell me about your pedagogy. (PK)

- **What is a typical lesson like in your classroom?**

Students do a drill that involves reading music notes for pitch.. they play recorders and I'm looking for rhythm and pitch.. When I'm entering a new unit I use a mini- lecture with powerpoint, or story bird for giving the history then they go to stations on a computer.. stations on listening to or to write music A write music or play music games.. I differentiate for band students, and lower students giving different lessons.. rotate and play instruments, and book work.. and Jane's powerpoints.. interactive ones.. go through on their own.. with pictures click on to learn about topic.. struggling students do the power points first.. .. closure.. sometimes written.. sometimes on wallwisher.. just something they have to get done throughout period.

When they are at their stations, they rarely write music, they are listening , they play music notation games, or they listen to music in different places, history or time periods.

P 6: P3 2nd Interview .docx - 6:4 [I use story bird... I use it so ..] (87:87) (Super)

Codes: [learning activity - Families (3): Changes in learning, Decisions about materials, Pedagogical Knowledge]

No memos

I use story bird... I use it so that I can talk less and the students are able to form ideas about the music before they listen to it... You can see people walking on the beach and ... I use it so they can focus on the story and pictures... you don't have to say song is about nature.. they pick up and articulate... they form their own ideas when going into the music... another layer of their musicianship... I use Power Point for lectures.. Kids use photo story for the create music feature, it allows me.. to assess if they have grasped the 5 elements of mood, tempo, dynamic, tone, and meter.they are not listed that way in photostory, . and then creating music that is reminiscent than what they have been using... with pp they wanted to write paragraphs or copy and paste.. rather than using lots of text, it allows students use pictures to understand bigger ideas... have been able to talk with interest and knowledge about their subject.. helpful to them and me.. get to see what I know even if they don't complete the whole projects.. helps the struggling readers. They have to Summarize their points in a concise manner. I use Wallwisher because it is a quick way to get brainstorming done.. without pieces of paper floating around classroom ... can access when not in the room... let's them see what fellow students in other classes are thinking.. I pose questions to one class and the other can see it. can get more ideas.. same with Edmodo.. addition of quizzes... I have different classes of the same grade on the same edmodo group... it excites them to be able to dialog... with others they don't see..encouraging for them classes are divided with performing arts in pm.. and non performing in the morning.. confident students in pm.. morning classes can see what other students are writing about.. I use the polls... as an incentive.. when they get other things done.

P 6: P3 2nd Interview .docx - 6:5 [I use story bird... I use it so ..] (87:87) (Super)

Codes: [Web 2.0 - Family: Web 2.0 tools]

No memos

I use story bird... I use it so that I can talk less and the students are able to form ideas about the music before they listen to it.... You can see people walking on the beach and ... I use it so they can focus on the story and pictures... you don't have to say song is about nature.. they pick up and articulate... they form their own ideas when going into the music... another layer of their musicianship...

P 6: P3 2nd Interview .docx - 6:6 [ou can see people walking on t..] (87:87) (Super)

Codes: [Why use 2.0? - Families (2): Changes in learning, Web 2.0 tools]

No memos

You can see people walking on the beach and ... I use it so they can focus on the story and pictures... you don't have to say song is about nature.. they pick up and articulate... they form their own ideas when going into the music... another layer of their musicianship

P 6: P3 2nd Interview .docx - 6:7 [helps the struggling readers. ..] (87:87) (Super)

Codes: [Web 2.0 - Family: Web 2.0 tools] [Why use 2.0? - Families (2): Changes in learning, Web 2.0 tools]

No memos

helps the struggling readers. They have to Summarize their points in a concise manner. I use Wallwisher because it is a quick way to get brainstorming done.. without pieces of paper floating around classroom ... can access when not in the room... let's them see what fellow students in other classes are thinking.. I pose questions to one class and the other can see it. can get more ideas.. same with Edmodo.. addition of quizzes... I have different classes of the same grade on the same edmodo group... it excites them to be able to dialog... with others they don't see..encouraging for them classes are divided with performing arts in pm.. and non performing in the morning.. confident students in pm.. morning classes can see what other students are writing about.. I use the polls... as an incentive.. when they get other things done.

P 6: P3 2nd Interview .docx - 6:8 [Speed of the internet at times..] (91:91) (Super)

Codes: [challenges with web 2.0 - Families (3): Challenges, Decisions about materials, Web 2.0 tools] [Technological factors for/against Web 2.0 - Families (3): Challenges, Decisions about materials, Web 2.0 tools]

No memos

Speed of the internet at times with wallwishers wouldn't load at all or too slowly ,, better lately ... access to web 2.0 has been find except ... finding music pieces... they have to go to Amazon.com to listen a sample... it would be nice to have more computers.. could get the mobile lab would take more time than I have... (gave tips on Google docs and sharing with students)...

P 6: P3 2nd Interview .docx - 6:9 [Most of the things I use now a..] (95:95) (Super)

Codes: [Impact of training on web 2.0 use - Families (2): Training, Web 2.0 tools]

No memos

Most of the things I use now are what I created in the workshops, I was able to apply or a couple of days after it. It helped my instruction And the students enjoyed it well enough to keep it going..

P 6: P3 2nd Interview .docx - 6:10 [some I don't like.. don't know..] (95:95) (Super)

Codes: [Impact of training on web 2.0 use - Families (2): Training, Web 2.0 tools]

No memos

some I don't like.. don't know what they are... but those I do, I use .. the structure of the workshop is helpful... they talk about it.. model it and time to do something you can use.

P 6: P3 2nd Interview .docx - 6:11 [Best example.. is the use of p..] (99:99) (Super)

Codes: [CK impact on web 2.0 use - Families (2): Content Knowledge, Web 2.0 tools]

No memos

Best example.. is the use of photo story I wanted find to be sure students didn't just present the project.. so I can assess what they are using musical terms and terminology to analyze music and

take information and apply it to something different based on what we had been learning. I try to find tools that don't take away from the content... sometimes that happened... PP got fact based and heavy... more about just about history and not the music itself... it only reached one or two kinds of students, the ones who like to read or present, not the ones who liked to hear and create music.

P 6: P3 2nd Interview .docx - 6:12 [Kept using all kinds... and saw ..] (103:103) (Super)

Codes: [Decisions about materials - Families (2): Decisions about materials, Pedagogical Knowledge]

No memos

Kept using all kinds... and saw what stuck.. If I was exposed to it, if I had time to experiment with it, I'd try it in the classroom, some things didn't work as well, maybe for that type of student.. I don't use voki in my general music class.. composers ... not a good use of .. funny looking, not relevant to the content.. 6th grade world music... don't want to put up a Chinese person to say this is the Chinese perspective... use voki for achievers.. not in general music classes

P 6: P3 2nd Interview .docx - 6:13 [Tried intentionally to talk le..] (107:107) (Super)

Codes: [adapted pedagogy - Families (2): Changes in teaching, Pedagogical Knowledge]

No memos

Tried intentionally to talk less and ask more questions.. the web 2.0 tools allow me to do that.. the way I use the tools.... In every case a question is posted.. Wallwisher or poll.. it's a question.. assignments or discussions on Edmodo.. story bird presentation I ask them questions.. It's helped me ask better questions.. and I work toward asking the students better questions.

P 6: P3 2nd Interview .docx - 6:14 [They are all successful... thing..] (111:111) (Super)

Codes: [adapted pedagogy - Families (2): Changes in teaching, Pedagogical Knowledge] [Success - Family: Success]

[Why use 2.0? - Families (2): Changes in learning, Web 2.0 tools]

No memos

They are all successful... things that don't work... don't use.. trial and error.. things that work I keep .. and adapt.. for different groups.. there have been some that work with one group and not another... the tools lend the flexibility to meet the individual needs of students and are catered to the students in the class.. the why.. the voki... what is available for use doesn't fit my classroom. . and another site .. avatars.. all the avatars are white.. and I won't bring that into the class because I want them to feel valued..

P 6: P3 2nd Interview .docx - 6:15 [The ones I keep talk about... an..] (115:115) (Super)

Codes: [adapted pedagogy - Families (2): Changes in teaching, Pedagogical Knowledge] [adapting Web 2.0 to content - Family: Web 2.0 tools]

No memos

The ones I keep talk about... any tool that I mention I'm using has been easily adaptable.. or I'm not using it.

P 6: P3 2nd Interview .docx - 6:16 [More efficient sometimes...I can..] (119:119) (Super)

Codes: [improving teaching or learning with web 2.0 - Families (4): Changes in learning, Changes in teaching, Pedagogical Knowledge, Web 2.0 tools]

No memos

More efficient sometimes... I can use less time talking instead of them explore.. transitions are aided by some of the tools.. don't have to stop for a written closure.. go onto Wallwisher at the end of the station... at the end of the class, we can pull it all together at the end of class.. wordle.. with better use of classroom time

P 6: P3 2nd Interview .docx - 6:17 [Teachers.. To keep trying them..] (123:123) (Super)

Codes: [recommendations]

No memos

Teachers.. To keep trying them.. take a workshop and I know it's hard to explore on your own time.. Good use of my time... I got parts of lessons done in the workshop... I was able to with creativity. got work done in workshops.. take a workshop or ask for help.. Administrators should take the workshops too... they should model them in faculty meetings.. it would be interesting to see them to use them there.. I've liked all the trainers I've worked with. I've learned a lot from

them. I do like the ones that try in their classes and have solid examples,.. they try to bring in ones from grade levels and content areas so you have a broader example of how to use the tools . Really try to adjust to people in the room by asking about Grade level and content area and they try to come up with ideas for the attendees.

P 6: P3 2nd Interview .docx - 6:18 [They like the story bird.. or ..] (31:31) (Super)

Codes: [Student choice - Family: Changes in learning]

No memos

They like the story bird.. or they can read it on their own, and see pictures, they do it at their own pace without me hovering over them and I think they stay a little more engaged, makes classroom management a little easier.. when they take the quizzes on Edmodo.. the really good thing and I don't have behavior issues... it's easier.

Appendix P: Permission letter from the district to conduct study

(Letterhead and signature removed to preserve confidentiality as requested below)

May 8, 2012

Ms. Barbara Bokszy
423 Paradise Road
Aberdeen, Maryland 21001

Dear Ms. Bokszy:

I have received and reviewed your request to 'examine what process teachers use to change their pedagogy to deliver effective instruction using Web 2.0 tools.' You are proposing to invite secondary teachers to participate in this research. A selection of six to ten voluntary participants will be engaged individually in three taped interviews regarding their training, knowledge, and subsequent adaptation of Web 2.0 tools to classroom teaching practices.

I am pleased to inform you that you may proceed according to your proposal provided that system, school, and participant anonymity is adhered to in all aspects of your research.

Please accept my best wishes for a successful and productive project.

Sincerely,

Supervisor of Accountability/LAC

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