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A Descriptive Study of Pedagogical Characteristics of Online Versus Face-to- Face Teaching Methods in a Secondary Blended Learning Environment

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A DESCRIPTIVE STUDY OF PEDAGOGICAL CHARACTERISTICS OF ONLINE VERSUS FACE-TO-FACE TEACHING METHODS IN A SECONDARY BLENDED LEARNING ENVIRONMENT

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ABSTRACT

Title: A Descriptive Study of Pedagogical Characteristics of Online Versus Face-to-Face Teaching Methods in a Secondary Blended Learning Environment

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Online learning in the K-12 environment is outpacing other alternatives to the traditional face-to-face classroom instruction for many students. The number of online learning opportunities in grades K-12 has increased over the last decade. Due to this expansion, it is critical to determine appropriate pedagogy for the online learning context, specifically in the blended learning environment.

The purpose of this study was to describe the pedagogical characteristics of secondary blended classrooms when teachers use face-to-face versus online teaching methods with the same group of students. Furthermore, the study examined teachers' pedagogical beliefs and the influence they had, if any, on the teachers' classroom practices.

Data were gathered qualitatively through classroom observations, teacher interviews and review of classroom documents. Quantitative data were obtained through numerical coding of the interview and observational data. The quantitative approach numerically described the qualitative information using descriptive statistics. Further statistical treatment of the data included the standard deviation of the mean and the calculation of the confidence intervals of the mean scores from the observation rubric. The participants in this study were selected using purposive sampling based on their instructional status.

This study reported differences in the pedagogy between the face-to-face teaching mode and the online teaching mode in the blended learning environment. The three teacher participants displayed more teacher-centered pedagogical practices in the face-to-face mode compared to the online mode in the blended learning environment. The results also displayed inconsistencies between the teacher participants' pedagogical beliefs and their classroom pedagogical practices with both the face-to-face and the online teaching methods in the blended learning environment.

The findings indicate a need for uniform professional development programming related to classroom pedagogy for both unique learning contexts. The participants' online classroom pedagogy was more student-centered compared to their pedagogical beliefs. It is a possibility that the professional development they received regarding instruction related to online pedagogy ultimately affected their observed classroom pedagogy. Several implications suggest various influences on teachers' classroom practices including contextual school factors, teachers' personal preferences, teachers' inability to transfer pedagogical knowledge from instructional environments, and the espousal of beliefs while practicing other beliefs.

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Dedication

For Rich,

I dedicate this dissertation to you.

Without your unending encouragement, patience, and advice,

this study would never have seen the light of day.

To my children, David and Victoria,

I hope you both "conquer your Mt. Everest" –

whatever that may be…

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CHAPTER 1

INTRODUCTION TO THE STUDY

Introduction

As electronic communication technologies advance, online and blended learning in the K-12 environment is quickly becoming an alternative for traditional face-to-face classroom instruction for many students. Over the past decade, the number of online schools and blended learning opportunities available to students in grades K-12 has increased dramatically. Watson (2008) reported that 44 of 50 states offered online learning opportunities for K-12 students. In 2011, Watson, Murin, Vashaw, Gemin, and Rapp discovered that online and blended options exist in all 50 states in addition to the District of Columbia.

A similar significant increase in student enrollment numbers for both online and blended learning environments have also occurred. In 2006, Picciano and Seaman estimated 700,000 public school students enrolled in K-12 online courses. They had undertaken the same study two years later and determined that over one million students enrolled in K-12 online courses in 2008. This increase signifies a 47 percent enrollment inflation in two years, or a compound annual growth rate of 21.3 percent (Picciano and Seaman, 2009). This exponential increase in virtual school programming has indicated that online learning is one of the most significant innovations in K-12 education (Tucker, 2007).

The evolution of online instruction in the K-12 sector began with distance learning programming or correspondence courses. As time progressed, instructional delivery methods changed due to the increased use of the Internet in the physical K-12

classroom environment. Many teachers and technology departments within school districts began experimenting with ways to use the Internet to extend beyond the school day. This use of technology within the classroom to broaden and enhance the curriculum led to a new model of instruction, called blended learning (Watson et al, 2011). Blended learning is commonly defined as a "combination of online and face-to-face instruction in which students learn part-time in a supervised location away from home and part-time through an online delivery, with some element of student control over time, place, path, and/or pace" (Staker, 2011).

K-12 online educational programming allows students access to course content and materials in a variety of instructional formats presented on a continuum from a full-time online curriculum to a traditional face-to-face physical classroom with little to no technology resources. The content within the online setting is presented either synchronously or asynchronously. Synchronous formats present content in real time with the teacher and students interacting simultaneously but in different locations, whereas asynchronous formats deliver the content any time, any place, with the teacher and students interacting via discussion boards and other forms of written communication to archive their thoughts and ideas (Berge & Clark, 2005).

Full-time online programs meet the needs of a certain segment of the K-12 student population; however, the number of students ultimately seeking a full-time online program may be lower compared to other alternatives and is projected to plateau. The instructional model blending both online and face-to-face instruction is being utilized at the school district level to meet the needs of learners who are not interested in full-time

online learning but who are also looking for an alternative to the traditional face-to-face classroom environment, especially at the secondary level.

As virtual learning opportunities in the K-12 educational environment have expanded and modified, determining the appropriate pedagogical techniques for the online and blended contexts is critical. Research has shown that online learning environments are much more complex than other educational settings (Ferdig, DiPietro, & Papanastasiou, 2005); therefore, additional research must be conducted to determine the characteristics of the teaching and learning process in both the online and face-to-face classroom settings (Vrasidas, Zembylas, & Chamberlain, 2003). Simply transferring pedagogy or instructional practices from the face-to-face classroom does not always convert to appropriate instruction in the online classroom (Davis & Roblyer, 2005). It is imperative to recognize that there are distinctive pedagogical practices for online learning environments.

Pedagogy is the standard term for the instructional practices or strategies in the classroom. For generations, the term pedagogy had been restricted to describe the educational strategies practiced in a physical classroom. It describes the interactions between the teacher and the students concerning the content and methods used to facilitate the learning process (O'Neil, 2006). With the addition of online learning environments, teaching began to contend with different elements of instruction, including interactivity, active learning, and collaborative learning (Jaffe, 1997). Based on numerous research studies, online learning requires an adjustment of instructional practices or pedagogy from the face-to-face environment to the online educational context (Tallent-Runnels, et.al., 2006).

Due to the evolution of education in the K-12 environment to include online learning, it is imperative to discuss the historical foundation of communication technologies that may have contributed to public schools adopting this format.

Background

Historical advances in communication methods throughout human history have led to major societal and intellectual changes. From the development of the written alphabet in 750 BC, to the advent of the printing press to mass produce books, to the arrival in the 20th century of films, radio, television, and computers, there have been massive upheavals in the way human beings communicate and teach (Carr, 2010). These shifts in primary modes of communication and knowledge sharing have generated ethical, cultural, and intellectual challenges for revolutionizing education.

While these communication changes have been occurring in everyday life, educational institutions are also apt to change but at a slower rate; they tend not to keep up with the emerging communication technologies of the time. Research has shown that this trend occurs since curriculum and pedagogy require proficiency and comprehension of the existing modes of communication, not necessarily the emerging modes of communication. Hence, the pedagogy used to teach the mastery of the existing dominant mode of communication is also outdated. This tends to make pedagogy harder to transform than any other educational principle (Luke, 2003).

Pedagogy has undergone only incremental changes since the 19th century. In the 1800s, several common teaching approaches had emerged. Teachers began stressing memorization, recitation, oral quizzes and drilling of facts for both reading and arithmetic (Woods, 1986). The blackboard became an important instructional tool in 1809. All

instruction was teacher-centered with the students performing skills and activities in a large group setting. Students utilized books as a way to build reading skills and also to memorize and recite passages. Desks assembled in rows, provided the teacher the ability to conduct class from the front of the room. These various instructional tools and strategies are still utilized in many classrooms across the country in the 21st century. Although the physical classroom was the mainstay of the educational platform in the 19th century, distance education began gaining ground with the advent of the postal service in the late nineteenth century (Ascough, 2002).

With the introduction of distance education in the 1800s, the concept of anytime, any place instruction began to take shape. Correspondence, print-based courses developed as an alternative to the physical classroom. As telecommunications technologies evolved, distance education opportunities expanded. Radio broadcasts of courses began in the early twentieth century and were soon joined by televised broadcasts of course material (Moore & Anderson, 2003). Distance education as it is known today, began with the move into the Information Age with the diffusion of computers in the American home.

Electronic technologies in distance education have transformed the interaction and communication between the teacher and the student. Throughout the 19th and 20th centuries, distance education was largely print-based, which allowed a direct link between teacher and student (O'Neil, 2006). With the development of electronic communication technologies, namely computers and computerized technology with Internet capability, the interaction now includes student-to-student and teacher-to-students, as a group. One of the most important roles for the contemporary distance

educator or online educator is to utilize appropriate pedagogical techniques for the online learning environment (Berge, 1995).

Some researchers believe that teachers' pedagogy is directly influenced by their beliefs and knowledge about the educational process (Pajares, 1992; Ajzen, 1985; Ernest, 1989; Clark & Peterson, 1986). However, there is still much debate regarding whether teacher pedagogical beliefs influence classroom actions or classroom actions influence teacher pedagogical beliefs. Therefore, there is a need to examine teachers' beliefs regarding pedagogy in order to determine how or if they affect their classroom practice. Teachers' pedagogical beliefs are essential in defining teaching tasks and the knowledge and information needed to complete those teaching tasks (Mansour, 2009).

Many teachers still believe that the online classroom is the same as the face-to-face classroom and that the pedagogical methodologies used to teach in a face-to-face classroom will be effective in an online course. According to a 1999 study by Palloff and Pratt, teachers have stated that to teach successfully online, the course material simply must be converted from one medium to another.

Statement of the Problem

Online education in the K-12 setting has been viewed as the solution for a myriad of recent educational problems including overcrowding, lack of certified teachers, funding, shortage of courses, assistance for remedial and accelerated students, and a need to educate students in a place other than a traditional classroom (Cavanaugh & Clark, 2007). Due to these and other factors, K-12 online and blended programs have grown rapidly in the last decade, with the most recent enrollment figures reaching over one million students (Picciano and Seaman, 2009).

Although K-12 online programs have grown and evolved since they began in the mid-1990s, limited data exists related to teaching and learning in K-12 online educational contexts (DiPietro, Ferdig, Black, and Preston, 2008). While, the computer has revolutionized education, the complex communication skills required between the teacher and learner continues to be elusive. There are some apparent variations between face-to-face pedagogy and online pedagogy; however, to maximize the effectiveness of online learning, there must be a clear understanding of the online educational context versus the traditional face-to-face educational context.

Little research currently exists to inform decisions regarding online learning in the K-12 environment. The majority of research regarding online and face-to-face learning has been conducted at the higher education setting (O'Dwyer, Carey, and Kleiman, 2007). How this research translates to the K-12 educational setting is unknown. Cavanaugh, Gillian, Kromrey, Hess, and Blomeyer (2004) warn against using the results of the higher education research in distance education to the K-12 setting, since K-12 online learning is distinctive.

Furthermore, most of the studies conducted at the K-12 level in the online learning setting have been restricted to comparisons of student achievement in online versus face-to-face courses. The interest in comparing the two environments originates from the issue of the validity of online learning as the latest in communication technologies (Bernard, Abrami, Lou, & Borokhovski, 2004). Rice (2006) supports the need for online education research to move beyond comparative studies and focus on factors of successful teaching and learning. Hence, a gap exists in the literature of

pedagogical characteristics of online teaching methods versus face-to-face teaching methods in the blended learning environment in the secondary school setting.

Purpose of the Study

The purpose of this study is to describe the pedagogical characteristics of the secondary blended classroom when teachers use face-to-face versus online teaching methods. Specifically, this study attempts to compare the pedagogical practices educators are currently utilizing with both the online and face-to-face teaching methods in a blended instructional format to facilitate the learning process in a high school in Pennsylvania. Teachers' pedagogical beliefs will also be examined to determine their influence on classroom practices with both teaching modes.

The blended learning environment is a component of the high school classroom. It is the objective of this study to reveal the pedagogy using both teaching methods and determine if they are similar, dependent on the teaching mode, the teacher and the technology. Without a descriptive study of the pedagogical approaches with both teaching methods, it would be difficult to determine effective teaching strategies using multiple delivery methods for future studies.

Research Questions

This study will focus on educators at the secondary level who utilize a blended learning model in their classrooms. The study will focus on one school district in Pennsylvania, chosen through non-random purposive sampling. The data collected from the participating school district will be used to answer the following questions:

1. What are the teachers' pedagogical characteristics in the secondary blended learning classroom setting when teaching in the face-to-face mode versus the online mode with the same group of students?
2. To what extent, if any, do teachers' pedagogical beliefs influence teaching practices in the secondary blended learning classroom setting when teaching in the face-to-face mode versus the online mode with the same group of students?

Significance of the Study

Due to the rapid increase of K-12 online education, including the blended learning model, it is notable that a growing number of instructional activities occur online. In 2009, over one million students enrolled in at least one online course; this number represents two percent of the total K-12 population in the United States. Seventy percent of these students were enrolled at the secondary level. Although K-12 online schooling has grown in demand, research on the pedagogical practices implemented to support students' academic success in the K-12 online environment is still lacking (Barbour & Reeves, 2009).

Since the inception of web-based education, much has been written and published regarding online courses at the higher education level. These studies had focused on student and faculty perceptions of online education, and comparisons of student achievement between the online and face-to-face contexts.

This is a descriptive study of pedagogical practices found in the blended classroom environment teaching in both the online and face-to-face modes at the secondary level. It is significant since there have been no other studies completed at the secondary level which have utilized a descriptive research method observing and

interviewing subjects on pedagogical techniques in both the online and face-to-face modes in a blended learning format (Rice, 2006).

Framework

Pedagogical practices in the classroom environment have been labeled into two distinct categories of teacher-centered or didactic teaching versus student-centered or constructivist teaching. As teacher professional development programming has progressed over time, pedagogical trends have changed based on what has been deemed as "best practices." The traditional didactic style of teaching has become outdated while the constructivist style of teaching has become the latest innovation in the classroom.

The "best practice" debate between teacher-centered versus student-centered practices has led some educators to abandon pedagogical approaches that may work in certain circumstances. It is not an issue of either/or regarding pedagogical style but rather an issue of balancing the two pedagogical styles to create a mix of strategies using both approaches dependent on the students' learning needs and the course outcomes (Moss, 2005).

This study uses the framework proposed by Moss (2005) which suggests that effective teaching focuses on a balance of pedagogical styles in multiple learning contexts rather than an either/or dichotomous relationship between teacher-centered and student-centered pedagogical styles. Isolating the teaching techniques oversimplifies the teaching process and disregards the means teachers use to gain a true learning environment.

Definitions

The following terms are defined according to their usage in this study:

Activity: The fraction of the class session when subject matter content is taught.

Asynchronous learning/communication: Communication in which the participants interact in varied time spaces (e.g., e-mail, threaded discussions, homework, message boards).

Blended learning: Combination of online and face-to-face instruction in which students learn part-time in a supervised location away from home and part-time through an online delivery, with some element of student control over time, place, path, and/or pace (Staker, 2011).

Blog: A contraction of "web log," it is an online Web journal.

Distance learning: Educational activity in which the participants are separated by space (e.g., correspondence courses, online learning, videoconferencing)

Face-to-face instruction: Any instruction and learning that takes place in a physical classroom at a designated time among teachers and students.

Online learning: The educational courses delivered through the Internet either synchronously or asynchronously (Berge and Clark, 2009).

Podcast: Repository of audio and video materials that can be taken anywhere, providing the potential for "anytime, anywhere" learning experiences.

Student actions: the nature and purposes of students' writing; the nature and frequency of students' questions; the nature of student–to-student interactions; and the students' understanding of and response to teacher expectations (Simmons et. al. 1999).

Synchronous learning/communication: Communication in which the participants interact in the same time space (e.g., telephone calls, face-to-face meetings, physical classrooms, chat rooms, videoconferencing).

Teacher actions: the number and types of teaching methods used; the nature and frequency of demonstrations and hands-on activities; the nature of teacher–to-student interactions; and the nature of the teacher's questions (Simmons et.al. 1999)

Threaded discussion: An electronic discussion in which users visually group messages in a hierarchy by topic.

Transition: The fraction of the class session defined as the beginning or ending of an activity.

Virtual school: Any K-12 online learning program presented by an educational organization in which students can earn credit toward graduation or toward promotion to the next grade.

Wiki: Web sites that can be edited by anyone who has access to them.

Organization of the Study

This dissertation is organized into five chapters. Each chapter contains information specific to certain areas of the study. The first chapter introduces an overview of the study and includes the background and historical context of distance education, online and blended learning, and pedagogy in public schools in the United States as well as a need to determine the appropriate pedagogical practices in distinctive educational contexts.

The second chapter provides a review of the literature pertinent to the topic of distance education and pedagogy. The review of the literature also provides an analysis of

didactic and constructivist teaching and learning in the context of online and face-to-face learning environments.

The third chapter provides the information relevant to the methodology of the research. The study is a descriptive research design, utilizing both quantitative and qualitative data collection techniques to examine pedagogical characteristics in the blended learning environment using both the online and face-to-face teaching modes. The chapter will also provide a description of the subject selection for the sample within the study. In this type of study, the researcher will conduct observations of subjects in the blended learning classroom, interview the teachers participating in the blended learning classroom environment, and will also analyze various documents and artifacts related to the classroom setting, including lesson plans and student assessments. Since the study includes a cross-sectional design, the data is collected during one point in time with a specific population at a certain time (Ruspini, 1999).

The fourth chapter describes the results of the study. The fifth and final chapter of the dissertation provides a discussion of the findings, an overview and summary of the research findings, a discussion of the meaning of the findings, and implications of the study, as well as recommendations for further research.

CHAPTER 2

REVIEW OF RELATED LITERATURE

Introduction

This chapter includes a review of the literature related to online learning, pedagogy, and teacher beliefs. The purpose of this study is to describe the pedagogical characteristics of secondary blended classroom settings using both the face-to-face and online teaching modes with the same group of students. This chapter is organized into four sections. The first section reviews the history and background of distance education and online learning. Section two describes blended learning; section three delves into the pedagogical theories of didactic and constructivist teaching practices. The fourth section examines the connection between teacher pedagogical beliefs and classroom practices.

Criteria for Selecting the Literature

Several types of literature were chosen for the literature review, including articles from peer-reviewed journals, books, unpublished dissertations, and meta-analytic reviews of previous studies. A systematic search of the journals specifically related to distance education, online learning, blended learning, pedagogy, and educational research resulted in studies found in *Innovations in Education and Teaching International*, *Journal of Research on Technology in Education*, *The American Journal of Distance Education*, and *The Journal of Distance Education*. Several national and international educational web sites were searched relating to distance education and virtual schools, including the International Association for Online Learning, the National Center for Research and Learning, the United States Department of Education, and the National Center for Education Statistics web sites. Finally, several databases were used to search and review

articles and statistics related to distance education, online learning, virtual schools, and pedagogy.

Historical Background

Throughout the history of education, students have traditionally learned in a physical classroom in which the knowledge transfer process between teacher and learner occurs through direct lecture or some combination of a learning activity utilizing seatwork. This instructional method encourages direct face-to-face teacher to student interaction through conversation and dialogue. The teacher is able to assess for learning using interpersonal communication including verbal and non-verbal communication skills and the student receives immediate feedback from the teacher in this instructional environment (Tharp & Gallimore, 1988). However, as individual student needs have changed over time, the goal of education has also changed to provide accessible learning opportunities for all students. As a result of this transformation, alternative virtual learning opportunities at the K-12 level have been created to provide the education without the same constraints on time, place and pace of instruction.

Distance education is not a modern concept. It originated in Europe in the mid-nineteenth century and generated a movement in the United States about 40 years later. Although the features of distance education have changed dramatically over the last two centuries due to the advances in technology, the concept of the separation of teacher and learner has remained intact. The distance education field has a long history and tradition at the higher education level. As the advancement of technology has progressed, online education at the K-12 level has become a product of distance education. Distance

education is characterized by the separation of the teacher and the students. Distance education is defined by Moore and Kearsley (1996) as:

> planned learning that normally occurs in a different place from teaching and as a result requires special techniques of course design, special instructional techniques, special methods of communication by electronic and other technology, as well as special organizational and administrative arrangements. (p. 2)

First Generation of Distance Education

Organized distance education began in the United States with the U.S. postal service. The mailing system helped facilitate the transportation of instructional materials for this type of distance education. The printed word is the only medium used for this method of instruction. In this system, teachers and students have no face-to-face contact. There is very little interaction between the teacher and the student. There is also little flexibility in time, place and pace of instruction. This era is defined as the first generation of distance education in terms of media and its effect on the pedagogical structure of instruction and is known as the Correspondence Model (Sloman, 2002).

In the 1840s, Sir Issac Pitman, creator of English shorthand, began offering correspondence courses in England utilizing postcards (Lau, 2000). During the next decade, the University of London expanded its outreach to include the British colonists in Australia, Canada, and India via correspondence courses. These programs were developed due to the size of the countries and the distance the students were located from the university campuses (Lau, 2000).

Shortly thereafter, the Chautauqua Institute in New York was founded in 1883 as the first institution in the United States to use the postal service to deliver correspondence courses (Dede, 1991). The college granted academic degrees to students who successfully completed work via correspondence. Because of the success of this type of distance education in Europe and at the Chautauqua Institute, the correspondence course movement began to spread throughout higher education. In the late 1800s, the University of Chicago created the first major correspondence program for higher education and other post-secondary institutions began to follow suit. The Colliery Engineers School of Pennsylvania began offering correspondence courses in mining, and Pennsylvania State College began offering correspondence courses in agriculture (Matthews, 1999).

Although many lauded the higher education institutions for creating new opportunities to thousands of adults who would have otherwise been excluded from the classroom, some began to question the effectiveness of correspondence courses (Glatter & Wedell, 1971). They disputed the quality and standards of the correspondence courses and argued that they would only be a substitute for face-to-face instruction (Matthews, 1999). The skepticism of the effectiveness and quality of distance education has continued to include current online learning methods.

Second Generation of Distance Education

The second generation of distance education is known as the Multi-Media Model. This era began with the widespread use of radio and television as the carrier and presentation of media in addition to printed material. These media require different teaching and learning strategies, which changed the pedagogical structures of the courses (Taylor, 1999).

In 1916, the University of Wisconsin was the first college in the United States to offer correspondence courses using the radio (Buckland & Dye, 1991). During the 1920s, Pennsylvania State University and Columbia University began offering correspondence courses using radio transmission. By the end of the 1930s, several other countries, including Turkey and Columbia, began to utilize radio instruction to mitigate geographical and monetary obstacles to education.

Television was the next emerging technology in the distance education field in this era. During the 1950s, Kansas State College, Purdue University, and Iowa University piloted television programming for distance education (Buckland & Dye, 1991). The first educational television program, Sunrise Semester, ran from 1959 to the early 1960s. The program was not cost-effective and only ran for a few years.

During the 1970s, several community colleges developed telecourses to deliver their distance education instruction. The Coastline Community College in California broadcast their telecourses to public broadcasting stations, colleges, universities, and libraries. During the same time, the Dallas Community College began developing and packaging telecourses on videocassette for distribution to other postsecondary institutions (Freed, 1999). This began a new instructional approach – video on demand – in which students could access instruction any time, anywhere.

As the telecourse model began to spread, the Public Broadcasting System (PBS) realized their role in distance education. In the 1980s, PBS began producing and broadcasting their own telecourses until budget constraints required them to purchase educational materials from other sources. PBS adopted their new role, broadcasting programs to local schools and colleges (Freed, 1999).

Third Generation of Distance Education

Advances in information and communication technologies initiated the third generation of distance education, known as the Tele-Learning Model. This period began after educators began to explore the availability of synchronous learning via technology. Though interaction between teacher and student is possible through this media, there is little flexibility regarding time, place and pace of instruction. These media created a new pedagogical model since the new central medium was videoconferencing (Sloman, 2002).

With the accessibility of television and videoconferencing in the 1980s, many postsecondary schools began offering videoconference courses between different campuses (Hancock, 1999). This type of learning environment allows the instructor and students to communicate synchronously using cameras in two different locations. By the 1990s, most schools had abandoned traditional correspondence courses and were offering some type of teleconferencing course on their campus to other students located in other classrooms, sometimes across the world (Hancock, 1999).

Fourth Generation of Distance Education

The fourth generation of distance education, also known as the Flexible Learning Model, improved the interactivity of distance education by introducing online instruction through multi-media and computer mediated communication by connecting to the internet. It provides greater flexibility regarding time, place and pace of instruction and learning. This model provides the synchronous and asynchronous learning formats in an accessible platform. The use of the Internet in online learning provides the opportunity for the student to experience a learning process that is collaborative, nonlinear, and interactive (Taylor, 1999). They can access references that are electronic and provided by

either the instructor or the other students. This type of learning environment also allows the learner to access supplementary resources and materials that will meet their individual needs.

Fifth Generation of Distance Education

The emerging Fifth Generation model of distance education, which is known as the Intelligent Flexible Learning Model, is based on the on-line delivery systems from the Internet (Taylor, 1999). The goal of this latest generation is to take advantage of the best qualities of the Internet and the Web. The Intelligent Flexible Learning Model of distance education integrates the use of automated response systems and intelligent object databases in the context of internet-based delivery. According to Taylor (1999), this model of distance education has the potential to provide students with a much more personalized pedagogical experience compared to the previous generations of distance education. This model is capable of increasing access to education and training activities on a global scale.

Online Learning

Distance education, online learning, virtual schools, and web-based instruction are all terms used interchangeably to describe this field of non-traditional instruction. A virtual school refers to any K-12, online learning program offered by an educational organization in which students earn credit toward graduation or toward promotion to the next grade. Online learning means educational courses delivered through the Internet in real-time (synchronously) or asynchronously (Berge & Clarke, 2009). The terms online education and virtual education are used synonymously in the K-12 instructional context.

Watson, Winograd, and Kalmon (2004) classified the five types of virtual schools as statewide supplemental programs, district-level supplemental programs, single-district cyber schools, multi-district cyber schools, and cyber charter schools. In statewide supplemental virtual programs, students take individual courses but are enrolled in a physical school or cyber school within the state. The state authorizes these programs and the state departments of education supervise them. The district-level virtual programs are usually managed by school districts and not overseen by state agencies. The single-district cyber schools offer an alternative to face-to-face instruction in the physical school environment and are run by the school districts themselves for students only within that school district. Whereas, the multi-district virtual programs are also run by the individual school districts but are offered as a service to all students within the state. The cyber charter schools contract within a single school district but also can enroll students from across the state.

Allen and Seaman (2010) further categorized online learning courses based on content delivery. Online courses are those where most or all of the content is delivered online. It is defined as at least 80 percent of seat time being replaced by online activities. Blended/hybrid courses are those that merge both online and face-to-face delivery methods. Thirty to 79 percent of the content is delivered online. Web-facilitated courses are those that use web-based technology to facilitate what is already being delivered in a face-to-face course (one to 29 percent of the content is delivered online). With the sudden increase in online learning, it is imperative to develop common language and similar definitions to collect accurate data.

Growth of Online and Blended Learning

Online or virtual learning began in the United States in the mid to late 1990s and has become a common instructional approach of distance education at the K-12 level. The most widely used definition of online learning is educational courses delivered through the Internet or using Web-based methods either in real-time (synchronously) or asynchronously (Berge and Clark, 2009). Surveys conducted over the past 10 years have shown significant growth in online course enrollments. Blended learning is defined as the combination of online and face-to-face instruction in which the student learns at least in part at a supervised physical location away from home and at least in part through online delivery with some element of student control over time, place, path, and/or pace (Watson et.al., 2011).

Beginning in 2000-01, K-12 online enrollments were estimated at 40,000 to 50,000 students (Clark, 2001). The following school year, the Peak Group (2002) estimated online enrollments at 180,000 students. The growth continued into the next academic year with 300,000 K-12 enrollments in online courses during the 2002-03 academic year based on a survey of 88 online course providers (Newman, Stein, & Trask, 2003). Estimates of student enrollment in K-12 online learning environments increased in the 2004-05 school year to 520,000 students (Hughes et al. 2007) to current approximations of over a million students (Cavanaugh and Blomeyer, 2007). The most recent projection is that by 2014, ten percent of all high school classes will be offered online and by 2019, this number of high school classes will increase to 50 percent (Christensen & Horn, 2008).

The single school district programs, which are considered programs run by one district for their own school district students, are outpacing all other segments within online learning. This means that school districts are the fastest growing segment of online and blended learning providers in the United States (Watson et. al., 2011). Several years ago, state-level virtual schools were the providers offering the most online learning programming; however, the majority of the online and blended options are now at the school district level. Researchers believe that the main reason this shift has occurred is that school districts serving their own local students have less of a need to bridge large distances; hence, online and blended learning opportunities and supports are more readily available (Watson et. al., 2011). A subset of the data shows that the majority of the online programming at the district level is blended learning not full-time online learning. Blended learning is now the fastest growing segment of online learning in the United States.

Blended Learning

Blended learning combines face-to-face instruction and online instruction in the same physical classroom. There are a variety of definitions for blended learning among educators. According to the Teaching and Learning Center at the University of Calgary, blended learning is the "integration of face-to-face and online learning to enhance the classroom experience through the use of information and computer technology." Allen, Seaman, and Garrett (2007) describe blended learning as a course that blends online and face-to-face delivery with a substantial portion of the content delivered online, typically using online discussions with some face-to-face meetings.

There are a variety of blended learning models depending on the teacher, classroom setting, course structure, or the school district. Six categories have been developed along a continuum from the face-to-face format to the predominantly online format. The first model is called the Face-to-Face Driver. This model utilizes face-to-face teachers to deliver the curriculum and only implements online learning on a supplemental basis. The Rotation Model rotates students between online learning and face-to-face instruction on a regular schedule. The face-to-face teacher supervises the online learning, which usually occurs in the physical classroom. The Flex Model reflects credit-recovery programs in that the online platform delivers the majority of the curriculum with teachers providing on-site support and tutoring (Staker, 2011).

The fourth model is the Online Lab. This model uses an online platform to deliver the entire course in a physical environment usually with paraprofessionals supervising the instruction. The Self-Blend Model includes students who take online courses to supplement their regular course work. The online class work is remote but their traditional classes are in physical classrooms. The sixth model, Online Driver, consists of an online platform with an online instructor for course delivery. Courses are usually remote with occasional face-to-face meetings (Staker, 2011). Blended learning provides flexibility to the traditional school schedule in terms of time, teachers, courses, and delivery methods.

Watson (2008) described blended learning as a "shift from lecture to student-centered instruction in which students become active and interactive learners." Utilizing this view of blended learning, it explains a transformation in pedagogical practices. It is

important to note that Watson (2008) further described his theory of blended learning to include not just the online delivery of the course but the face-to-face delivery as well.

Regardless of the mode of instructional delivery, pedagogy requires an awareness of the opportunities and limitations of the learning context. In order to have effective teaching and learning using both the online instructional delivery method and the face-to-face instructional delivery method, teachers must understand the pedagogical principles and the potential for technology in the instructional process.

Pedagogy

Teaching is a complex undertaking, which involves classroom management, lesson planning, preparation of teaching and learning activities, the development of a positive instructional environment and the utilization of appropriate evaluation tools and feedback. The decisions teachers make when determining these components of the instructional process are known as pedagogy. They are based on assumptions and theories regarding the learning process and how students will best access the learning material (Blomeyer, 2002).

Bruner (1999) described pedagogy as a science, in which the teacher understands the different learning strategies and knowing when it is appropriate to utilize those strategies. How teachers choose learning strategies may be dependent on the beliefs teachers have regarding how students learn and make meaning from their environment.

There are two divergent views of teaching and learning: the didactic method and the constructivist method. The didactic view of learning suggests that knowledge is transferred from the teacher to the student through direct lecture and practice. The didactic philosophy of learning overlooks the students' individual experiences and

knowledge backgrounds. It further deems students to be passive recipients of information in the instructional process (Kelly, 1970). Didactic teaching, also known as direct instruction, is associated with the behavioral learning perspective. It has been a pedagogical teaching strategy, used for decades, whereby the teacher delivers the content matter. The goal of this learning model is to emphasize the memorization of facts rather than gaining deep knowledge and understanding.

Conversely, constructivism emphasizes the active role students' play in this theory of teaching and learning. In this type of learning environment, students experience contextual and real-world learning activities leading to discovery and interpretation of material. Constructivism is based on the principle that knowledge is built upon the information and experiences students have already encountered (Hausfather, 2001). Furthermore, constructivists believe that learning is inherently a social process in which students collaborate with others to create projects, discuss ideas, and explain phenomena. The goal of constructivist learning is deep understanding of subject matter beyond simple recall of facts including the connection of previous knowledge to new material and the application of new information to real world situations (Brophy, 2002).

The online and blended learning environments lend themselves to constructivist teaching practices due to the importance of teacher-to-student and student-to-student levels of interaction. Furthermore, the online and blended learning settings are conducive for problem-based learning activities, which focus on authentic situations where students "discover" knowledge in the process of solving real-life problems (Hung, 2002). Teachers tend to be facilitators of the instructional process in the constructivist setting rather than deductive teachers in the didactic setting.

An important concept to note is that teacher beliefs influence classroom practice and expectations for student success (Snider & Roehl, 2007). Beliefs guided by knowledge create professional expertise; however, they have the potential to develop into personal philosophy lacking support or evidence. Beliefs are based on opinions, while facts characterize verifiable trends (Murphy, Delli, & Edwards, 2004). Belief systems are personal and, unlike knowledge systems, do not require validation (Snider & Roehl, 2007).

Beliefs tend to influence teachers in the classroom since there is a lack of objective and verifiable evidence regarding "best practices" in the educational environment. Therefore, teachers' previous experiences and prior knowledge have the potential to influence their future instruction (Bransford & Schwartz, 1999). It is critical to determine the knowledge base for teachers when designing pedagogy for both face-to-face and online coursework. Kynigos and Argyris (2004) suggested that researchers could learn about teacher beliefs through classroom observation in conjunction with teacher interviews.

Teacher Beliefs and Knowledge

According to Clark and Peterson (1986), the instructional process involves two essential components: teachers' thought processes and teachers' actions or observable behaviors in the classroom. Teachers' thought processes are not an observable phenomenon. They have been categorized into the three areas of teacher planning, teacher interactive thoughts and decisions, and teacher theories and beliefs.

Teacher planning and interactive thoughts and decisions occur in the preactive, interactive, and postactive phases of classroom instruction. These are the decisions

teachers make before, during, and after the teaching process that guide their thinking and actions in the classroom. Teachers' theories and beliefs include the knowledge and beliefs they possess regarding pedagogy and their subject matter content (Clark and Peterson, 1986).

All teachers have beliefs regarding their students, their subject matter, and classroom pedagogy; however, there are many definitions of teachers' beliefs in the literature. Pajares (1992) differentiates between belief and knowledge, in order to describe teacher beliefs. He explained that knowledge is an objective fact, while beliefs are subjective and based on judgment. Kagan (1992) referred to beliefs as a "particularly provocative form of personal knowledge" and believed that teachers' professional knowledge was more accurately defined as beliefs. Clark (1988) described teacher beliefs as coming from many sources including "rules of thumb, generalizations drawn from personal experience, values, biases, and prejudices" (p.5).

Extant research presents conflicting definitions of teachers' beliefs and knowledge. Calderhead (1996) suggested that beliefs are a teacher's ideologies, whereas their knowledge refers to factual and objective concepts and theories. Nespor (1987) and other researchers (Kagan, 1992; Pajares, 1992) have concluded that beliefs are more compelling than knowledge in determining how teachers make decisions and implement them in the instructional process. Beliefs, then, would be stronger predictors of teacher behavior compared to teacher knowledge.

Nespor (1987) found that teachers who have similar content knowledge but differing pedagogical beliefs will teach differently since their beliefs are more powerful than their knowledge. A study completed by Ernest (1989) had similar results. He

examined the effects of teachers' knowledge of math and found that two teachers who have similar knowledge teach differently due to differing pedagogical beliefs. The teachers' pedagogical beliefs proved useful in predicting the teachers' decision-making processes in the classroom.

Borg (2001) concluded that the strength of teachers' content knowledge effects their pedagogical beliefs and instructional choices. He believed that teachers with a strong foundation in their subject matter are able to deliver the curriculum more confidently and with a broader repertoire of teaching strategies. Borg's study determined that a teacher who had substantial knowledge in literature but was weak in English grammar demonstrated different classroom practices during the respective literature and grammar lessons. The teacher was interactive and student-centered during the literature lessons but teacher-centered and lecture-based during the grammar lessons.

Nature of Beliefs

Teachers' pedagogical beliefs develop throughout their careers. Beliefs are shaped through a succession of events, through chance, or from a powerful experience (Pajares, 1992). Beliefs can be drawn from personal experiences or cultural sources of knowledge (Nespor, 1987), and early experiences tend to influence later experiences (Ertmer, 2005).

According to Shulman (1987), teachers' pedagogical beliefs are derived from four sources: content knowledge, educational materials, formal teacher education, and the "wisdom of practice." Richardson (2003) named three sources of teachers' beliefs: personal experience, experience with schooling, and experience with formal knowledge. He believed that the most important source of teachers' pedagogical beliefs was from schooling since teachers were students for so many years in formal schools. Zeichner

(1980) also believed that teachers' experiences as students in school had a stronger impact on them than their formal teacher training.

Further research strengthens the idea that teachers' pedagogical beliefs emerge due to the amount of time watching and participating in classrooms as students (Gunstone, 1989; Joram & Gabriele, 1998; Mertz & McNeeley, 1991). Lortie (1975) explained this as the "apprenticeship of observation," in which the observations of teachers in the classroom influence one's perception of what it means to be a teacher. These beliefs may be more resistant to change since they have been formed over years of experience (Ertmer, 2005).

Due to the variability and strength of some pedagogical beliefs compared to others, the ability for teachers to reform and revise their beliefs may be related to how central they are to the teacher's identity (Rokeach, 1968). Rokeach described the concept of teacher beliefs using the analogy of an atom. The core beliefs located near the center are most resistant to change and are formed through personal and direct experiences. The beliefs located near the outside of the atom are least resistant to change and are the most inconsequential beliefs usually related to matters of taste.

Changes to teachers' pedagogical beliefs do occur; however, arguing or reasoning with teachers will not change their beliefs. In order to change teachers' core beliefs, a complete conversion process must occur (Nespor, 1987). Teachers must be dissatisfied with their current beliefs or their beliefs must be challenged. According to Kagan (1992), if professional development programs are to promote changes to teachers' pedagogical beliefs, they must make teachers state their current beliefs, challenge those beliefs, and provide opportunities to integrate new information into their schema.

Pedagogical Content Knowledge

Lee Shulman (1987) developed the concept of pedagogical content knowledge (PCK). He defined PCK as knowledge about how to teach particular content. Within PCK, he included,

> the most useful forms of representation of those ideas, the most powerful analogies, illustrations, examples, explanations, and demonstrations – in a word, the ways of representing and formulating the subject that make it comprehensible to others. (p.9)

Pedagogical content knowledge also includes the expertise of knowing what makes a subject difficult or easy to learn. Teachers need to know the obstacles students may encounter depending on presumptions they have of the subject and its content, in order to teach the material effectively. Students' biases towards subjects and content may have developed based on their ages and their backgrounds. Effective teachers can mitigate these issues by utilizing appropriate teaching strategies to transform the students' learning (Shulman, 1987).

The concept of PCK is especially pertinent in the blended classroom environment. Since there is a knowledge building approach to learning with the online teaching method, instruction using this mode is focused on the course structure and the use of the teaching materials. Teachers using the online teaching mode must be aware of the common misconceptions and presumptions students have about the certain topics within their subject matter. They can address this through instruction rather than as a separate component to the course.

There are many pedagogical strategies related to Shulman's PCK's framework that teachers use in the blended classroom environment. Some of these strategies include modeling, analogies, and metaphors to assist in the understanding of the content-related material. Teachers must be able to contextualize information to improve student understanding and increase student engagement with the material. To create the materials and develop the appropriate teaching strategies, teachers must have a clear understanding of how technology and the online environment affect the content and the pedagogy of what they are trying to teach. Koehler and Mishra (2005) expanded Shulman's definition of PCK to include the concept of technological pedagogical content knowledge (TPCK).

Technological Pedagogical Content Knowledge

Technological pedagogical content knowledge **(**TPCK) is the combination of the three types of knowledge: content knowledge (subject matter to be taught), technological knowledge (computers, the Internet, networking, etc.), and pedagogical knowledge (methods of teaching and learning) (Koehler and Mishra, 2005). Simply adding the technology component to the existing teaching and content areas is not an effective method of delivering online instruction. Technology must be integrated into the teaching and learning context.

There is an ongoing debate whether student learning is affected by the use of the delivery medium or the design of the instruction (Clark, 2001; Kozma, 2001). Educational history has shown that technology assists students to access course materials and can increase interactivity between teacher and learner; however, Clark (1984) claimed that technology is simply the medium for the content and does not affect student achievement in itself. Jasinski (1998), in agreement with Clark, stated that technology

does not cause learning. Online technology, as an instructional tool, does not cause changes in learning; rather, what does improve learning is well-designed instruction.

Quality instruction in the online educational environment requires the use of effective pedagogical practices. The pedagogical strategies teachers use in the online mode to design and implement their courses reflect their knowledge and skill level of the pedagogical, technological, and content knowledge they possess (Russell, 2004; Savery, 2005).

Effective pedagogy does not just refer to knowing the subject matter, understanding pedagogical approaches, and utilizing the correct teaching strategies for the teaching discipline. According to Tharp (1997), it also means knowing the students' homes and their communities to better understand how their teaching impacts their students' learning. Instructional conversations, cultural compatibility, knowledge, literacy, guided participation, language development, and the communities of learners are the concepts that researchers have found influence student achievement (Tharp & Gallimore, 1988). In classrooms, teacher effectiveness is a strong determiner of differences in student learning, surpassing differences in class size and heterogeneity (Darling-Hammond, 2000).

Nexus between Teacher Beliefs and Pedagogy

The relationship between teacher beliefs and pedagogy is complex (Kynigos & Argyris, 2004). There is much debate on whether or not teacher beliefs influence pedagogy or pedagogy influences teacher beliefs. Pajares (1992) suggests that teacher beliefs influence their perceptions, which then affect their classroom practices, or pedagogy. Ajzen (1985) agreed in that an individual's beliefs develop a value system,

guiding their actions. Haney, Czerniak, and Lumpe (1996) stated that teacher beliefs are significant indicators of classroom practices. Teachers' beliefs about subject matter have also been found to influence daily pedagogical decisions, such as what to teach, what to omit, and how much time to spend on a particular topic (Cronin-Jones, 1991).

Some researchers reported that teacher beliefs and classroom practice were consistent (Savasci-Acikalin, 2009; Thompson, 1992). In one study, Yero (2002) found that beliefs could affect how teachers behave in the classroom. She noted,

> If teachers believe a program they have been told to use is based on a solid foundation, and if the program is based on beliefs similar to their own, they will notice ways in which the program works. If they believe it is a waste of time, they will notice evidence supporting that belief. (p.24)

Other studies have led to mixed results. In a study by Kinzer (1988), preservice and inservice teachers both showed similar pedagogical beliefs regarding reading development, however, the inservice teachers were more inconsistent in their choice of lessons. The results were supported by a replication of this study (Readence, Konopak, & Wilson, 1991), which suggested that the link between teachers' pedagogical beliefs and classroom practices varied. It is important to note that the teachers' responses in these studies may have reflected what should be done in the classroom rather than what they had actually done in the classroom.

Inconsistencies between teachers' pedagogical beliefs and their classroom practices have been attributed to various contextual factors, namely the complexities of the classroom and the diverse psychological, social and environmental aspects of the

school setting. The contextual factors can act as either opportunities for positive pedagogical change or restrictions on teachers' constructive pedagogical strategies.

Due to the conflicting results found in the research, there is a need to examine teachers' pedagogical beliefs in order to clarify their potential affect on pedagogical practice. The ability to determine the influence of teacher beliefs on pedagogical practices would advance the knowledge of the instructional process in both the face-to-face and online teaching modes in the blended learning environment (Aguirre & Speer, 2000).

Salish I Research Project

A classroom observation tool developed in 1995 by the Salish I Research Collaborative describes the pedagogical practices on a continuum from the didactic style of teaching to the constructivist style of teaching (M. Twiest, personal communication, December 21, 2011). The Salish I Research Collaborative consisted of several leading researchers from universities across the country. The Salish I project was the first nation-wide research study to measure the effectiveness of teacher preparation programs. The researchers utilized several guiding tenets for this study including the connection between teacher knowledge and beliefs, teachers' performances, and student outcomes (Salish I Research Collaborative, 1997).

The study piloted several new instruments during the five-year study. As a result, a validated version of the Secondary Teaching Analysis Matrix (STAM) (Gallagher & Parker, 1995) instrument was developed and implemented. This observational instrument classified teachers' and students' actions according to content, teachers' actions, students'

actions, resources, and the environment. The teaching style was classified along a continuum from the didactic to the constructivist inquiry.

Another instrument used in the Salish project was the Teacher Pedagogical Philosophy Interview (TPPI) (Richardson & Simmons, 1994) which is an interview protocol focusing on the nature of teaching, the nature of learning, the self as teacher, and epistemology. A third instrument provided demographics about the research participants.

Research Using Salish Instruments

There have been various studies using the Salish I instruments (Waggett, 2001; McGlamery & Fluckiger, 2001, Simmons et.al., 1999) to determine teachers' pedagogical practices and their link to teacher preparation methods. Simmons et. al. (1999) reported the Salish I research results, which included ten beginning teachers from nine of the participating universities. The STAM and the TPPI were utilized in the study with the participating teachers. The researchers studied the perceptions, beliefs, and classroom practices of the teachers related to their philosophies of teaching and pedagogical skills. A significant result of the study was the inconsistency between the teachers' beliefs in student-centered learning and their lack of practicing that pedagogy in the classrooms (Simmons et. al., 1999).

Similarly, McGlamery and Fluckiger (2001) used both the STAM and TPPI instruments in their study of beginning teachers' beliefs and practices and also found a conflict between beliefs and classroom pedagogical practices. Waggett (2001) focused her study on preservice teachers and their beliefs compared to classroom practice. She used fifteen of the 50 TPPI questions, a Salish teacher perception survey and the ESTEEM observation instrument. Her study found no significant correlations between

the beliefs and actions; however, these were also based on preservice teachers' self-reported information.

Although large collaborative studies have been completed using the Salish I Project instruments to determine if teacher beliefs influence pedagogical actions, there have been no studies to utilize these instruments in the K-12 blended learning environment. Research in the online and blended learning environment is still limited, especially at the K-12 level. The majority of the research has been focused on student achievement comparisons between the online and face-to-face learning environments.

K-12 Online Education Research

Student Achievement

Although more than one million students at the K-12 level are currently learning online, research efforts have not been able to keep the same pace. The first comprehensive literature review did not occur until 15 years after the first K-12 virtual school went online. A comprehensive search of published literature from 1996 to 2006 found no experimental or quasi-experimental studies that compared the learning effectiveness of online and face-to-face instruction for K-12 students. Extending the time frame to include studies to 2008 increased the K-12 search to nine published studies (Means et al. 2010).

Most extant research in K-12 online learning focuses on the analysis of student achievement data as it relates to traditional face-to-face instruction (Cavanaugh, 2001). The results of comparative studies as well as meta-analyses of these studies conducted during the 1990s and the first decade of the new millennium showed conflicting results. Three meta-analyses addressing K-12 students in both the online and face-to-face

learning environments found no significant differences in student achievement (Bernard et. al. 2004; Ungerleider and Burns, 2003; Cavanaugh, et. al. 2004). Several other K-12 comparative studies found either higher achievement levels by students in online programs (Hughes et. al. 2007; Cavanaugh et. al. 2004) or no achievement differences between online and face-to-face students (Summer, Waigandt and Whittaker, 2005; Neuhauser, 2002; Ferdig, DiPietro and Papanastasiou, 2005).

One meta-analysis suggested that online education is more effective than traditional face-to-face instruction. A study conducted by Shachar and Neumann (2003) included 86 studies in their meta-analysis of online versus face-to-face instruction. They reported a moderately positive effect size for online learning, using academic performance as the outcome variable. Notably, the 86 studies used in their meta-analysis were selected from among the 232 studies used in the Bernard et. al. (2004) meta-analysis, which reported no significant differences in student achievement in the two educational contexts.

After reviewing the various meta-analyses conducted over the last several years in K-12 online learning and student achievement, it appears that different applications of the meta-analytic methods yield different results. According to Rice (2006), analysis of this field is difficult based on a lack of consistent experimental comparative methodologies that control for a multitude of confounding variables. Small sample sizes, dissimilar comparison groups, and differences in instructor experience and training also impact the results of the various comparative studies conducted in the K-12 online learning context (Kozma et al., 2000; Mills, 2000).

Smith, Clark, and Blomeyer (2005) completed a synthesis of K-12 online learning research, which reviewed the potential effectiveness of online learning as an instructional method. The findings of this analysis supported the conclusions of the Cavanaugh et al. (2004) meta-analysis in which there were no achievement differences between online learning and face-to-face instruction. This study called for more research on academic achievement effects related to student readiness for online learning, student-to-teacher and student-to-student interaction within classes, and professional development for online teachers.

Many researchers have recommended future studies to progress beyond basic comparisons of face-to-face and online classrooms and focus on factors of successful teaching and learning (Roblyer & Knezek, 2003; Rice, 2006; DiPietro, 2010). Ferdig, DiPietro, and Papanastasiou (2005) mention that "face-to-face and online courses are comprised of differing components, and thus comparing the two on certain levels is similar to comparing apples and oranges" (p.2).

Rice (2006) categorized research in the K-12 online learning field in two areas: comparisons of student achievement and studies examining the quality and characteristics of the teaching and learning experience. The latter category included studies of learner characteristics of successful online students. Many factors are involved in the success of the students in the online environment. Some of the reported characteristics are greater learning autonomy and student responsibility (Morris & Wu, 2005). Haughey and Muirhead (1999) completed a summary of characteristics, which described the successful K-12 online student as highly motivated, self-directed, independent, having strong literacy skills, and technology skills. An issue raised by Barbour (2009) is that this

summary does not include a complete description of all students who typically choose the online educational environment at the K-12 level and who are also successful.

Researchers have begun the initial examination of the K-12 online learning environment; however, due to a myriad of potential barriers noted by Smith et al. (2005), studies are at the formative stages. In some cases, essential data is either missing or not available, there is a lack of valid and reliable assessments, study time frames do not correspond to school years, and the primary focus of student achievement by the Department of Education is measured by standardized tests (Smith et al. 2005).

Chapter Summary

Online learning has its beginnings in distance education, which began about 150 years ago. Early correspondence courses, using the postal service as its medium, were the format for distance education in the 19th century (Matthews, 1999). As technology emerged with the widespread use of the Internet, a larger number of students were able to participate in distance education. With the use of the Internet, as a method to access curricular materials and facilitate instruction, online learning was born. Rather than one medium used to deliver content, the Internet enabled educators to provide instruction using multiple media in both real time and asynchronous formats.

Colleges and universities were the first educational institutions in the nineteenth century to adopt online learning in the United States (Bower & Hardy, 2004). Throughout history, the American educational system has been able to maintain social progress by increasing access to instruction. Within the last two decades, the K-12 school systems have also begun to offer online educational programming to its students in a variety of formats, including the blended learning environment. Picciano and Seaman (2007; 2008)

compiled recent enrollment data for K-12 online students and reported a total population of over a million students.

Online learning and online pedagogy share some similar characteristics of the face-to-face classroom and learning environment; however, it is important to note that the two modes of instructional delivery should reflect the needs of the students, the unique learning context, and the method in which the content is disseminated. One of the primary methods of determining pedagogical approaches and knowledge is through classroom observation.

Research in the area of K-12 online education is limited and reports conflicting results regarding comparative studies of student achievement. Extant research of online learning reveals flawed methodologies in several areas including small sample sizes and dissimilar comparison groups. Researchers, however, have claimed that the effectiveness of distance education and online learning seems to have less to do with the instructional medium itself than with the pedagogical strategies and practices (Clark, 1984; Jasinski, 1998).

CHAPTER 3

RESEARCH METHODOLOGY

Introduction

The purpose of this study is to describe the pedagogical characteristics of teachers in the secondary blended learning classroom setting when teaching in the face-to-face mode versus the online mode with the same group of students. Data were gathered from three sources including classroom observations, teacher interviews, and review of lesson plans and student assessments. The descriptive research method was used for this study to address the guiding research questions:

1. What are the pedagogical characteristics of teachers in the secondary blended learning classroom setting when teaching in the face-to-face mode versus the online mode with the same group of students?
2. To what extent, if any, do teachers' pedagogical beliefs influence teaching practices in a secondary blended learning classroom setting when teaching in the face-to-face mode versus the online mode with the same group of students?

Chapter three includes an overview of the research design, an explanation of the selection of participants, the study setting, and the timeline of the study. The research methodology and rationale for the choice of methods is also outlined. The chapter presents the information pertaining to data collection, instruments used, and data analysis of the study.

This study will add to the literature of pedagogy of K-12 online learning, since there have been no other studies completed at the secondary level which have utilized a descriptive research method observing and interviewing subjects on pedagogical beliefs

and practices using both the online and face-to-face teaching modes in the blended learning environment (Rice, 2006).

Study Design

This study utilized a descriptive research design and employed both the qualitative and quantitative research methods to describe the pedagogical characteristics of teachers in the secondary blended classroom setting when teaching in the face-to-face mode versus the online mode with the same group of students. The benefit of using a mixed method approach is that it provides a deeper understanding of a phenomenon (Gay, Mills, & Airisian, 2009). Since descriptive research spans the quantitative and qualitative methodologies, it describes events with more depth, organizes quantitative data in distinctive ways, and focuses on specific research techniques.

Descriptive research refers to the nature of the research questions and data analysis applied to the study. Descriptive research describes a phenomenon rather than determining causality between variables (Gay, Mills & Airasian, 2009). This study gathered data describing a phenomenon in the classroom, then organized the data into visual and other forms of manageable information (Glass and Hopkins, 1984). The phenomenon described in this study is the pedagogy occurring in a blended learning classroom using both the online and face-to-face teaching modes in the secondary educational environment.

Mixed methods research requires a comprehensive knowledge of both qualitative and quantitative research approaches, the time to dedicate to the study, and the resources to implement this type of research method (Gay, Mills, & Airisian, 2009). The qualitative approach was used in this study for the classroom observations, teacher interviews, and

the review of lesson plans and student assessments, whereas the quantitative approach was employed to numerically describe the qualitative information using descriptive statistics including the computation of the mean for the STAM and the TPPI and the determination of the frequency of the scores for the STAM observation rubric. Further statistical treatment of the data included the standard deviation of the mean and the confidence interval of the mean. These calculations assisted in determining how well the mean represents the data observed as well as the range of values the population proportion should fall with a 95 percent level of confidence.

The Salish I Research Project

The Salish I Research Project was a collaborative study conducted by ten universities to examine the effectiveness of teacher education programs (Salish I Research Collaborative, 1997). Data included in the original study consisted of beginning teachers' beliefs related to pedagogical practices. The observation instrument was designed for researchers and others to describe the pedagogical practices occurring in a classroom according to several categories and classifications, namely the continuum between the didactic teaching method and the constructivist teaching method. Likewise, the interview protocol utilized in the Salish I Research Project was designed for teachers to describe their educational experiences and pedagogical beliefs.

The two instruments and their standard operating procedures used in this study were acquired from the Salish I instrument packet and user's guide (Salish I Research Collaborative, 1997). Permission to use each instrument was obtained from each instrument author(s) via email correspondence.

Rationale

The research questions of this study were developed to determine the teachers' pedagogical practices and their pedagogical beliefs' using two distinct teaching methods in the blended classroom setting – the face-to-face teaching mode and the online teaching mode. A qualitative and quantitative methodological approach facilitated comprehensive information gathering related to classroom observations, teacher interviews and a review of lesson plans and student assessments. Since research has shown that classroom observations can reveal more about teacher beliefs along with teacher interviews, this study employed both methods to answer the guiding research questions (Kynigos & Argyris, 2004).

Procedures

This study took place in several stages. In the first stage, school districts in eastern Pennsylvania were contacted to determine if they currently offer full-time online learning options and/or blended learning options in their high school. The researcher then developed a list of potential school districts that met the criteria and chose one high school based on a non-random purposive sampling. The superintendents and building level administrators of that school district were contacted for formal consent to begin the next stage of the study.

In stage two of the study, the researcher and the school district administrator mutually selected the teachers who would be observed in both the face-to-face classroom setting and the online classroom setting through purposive sampling. Several barriers to the selection of teacher participants were encountered including participant lack of interest and low number of student enrollments in the online courses. It was deemed

necessary to include teacher participants who instruct in the blended learning format in the sample population since they also teach using both the face-to-face as well as the online teaching methods in the secondary school environment.

Once the researcher obtained three teacher participants who instruct in the blended learning format in the high school, letters of informed consent to the teachers were presented individually to each of the participants. Follow-up phone calls and emails were made to the teachers to answer any questions they may have had relative to the study (Appendix A). The letters of informed consent were also presented to each class of students and letters were presented to students for the parents/guardians of those students enrolled in the classes to be observed (Appendix A). Once written authorization was received from all parties including the school district, teachers, students, and parents/guardians, the classroom observations were scheduled.

The researcher observed three classroom teachers in a blended learning environment instructing two 90-minute blended class sessions within a two-day timeframe. Therefore, each teacher was observed for three hours per course. During each 90-minute teaching block, the teacher used both the face-to-face and online teaching methods. Student actions were observed in the classroom environment by analyzing both synchronous and asynchronous methods.

In stage three, the researcher conducted individual phone interviews with the teachers involved in the classroom observations. All phone interviews were audio recorded and transcribed for later qualitative analysis. The interviews focused on teacher beliefs regarding pedagogy and instruction. Lastly, the researcher examined course materials associated with the classes observed, including lesson plans and student

assessments. After the classroom observations, teacher interviews, and review of course materials were completed, the researcher analyzed the data and presented the findings.

Selection of Participants and Study Setting

Prior to beginning the study, the researcher applied to the university Internal Review Board (IRB) for research involving human subjects. The IRB application included details regarding the study's purpose and objectives, participant selection, research methodology, informed consent, and benefits of the study. Participants were contacted after the full IRB approval was received.

The study setting was selected based on the type of educational program offered in the school district's high school. The amount of time students spend in the online environment determines the type of courses offered. According to Allen and Seaman (2010) courses can be defined as web-enhanced learning (1-29% of the content delivered online), blended learning (30-79% of the content is delivered online) and online learning (80% of content delivered online).

This study described the pedagogical characteristics of the online learning environment based on the course definitions of Allen and Seaman (2010). The criterion for participation in the study is high schools offering blended learning (30-79% of the content is delivered online) to full-time students. The researcher selected the blended learning model since the study described the pedagogical characteristics of both the face-to-face teaching method and the online teaching method; blended learning combines both learning modes.

This study began by contacting school districts in eastern Pennsylvania to determine if they currently offer online learning (80% or more instruction delivered

online) or blended learning (30-79% of the content is delivered online) in the high school to their full-time district students. Once this criterion was met, the researcher contacted school administrators by phone and informed them that an East Stroudsburg University doctoral student was conducting a study of pedagogical characteristics using both online and face-to-face teaching methods in a secondary blended learning classroom. After determining that the school met the required criteria and selecting a school using purposive sampling, the school district administrators authorized the study to occur within the school district.

The researcher and the school district administrator mutually selected the teachers from the high school to be observed in the blended learning classroom setting through purposive sampling. The teachers selected in the sample were teachers who instructed within the blended learning format in the high school. The teacher participants who agreed to be observed in the classroom were also interviewed in a separate follow-up session. The teachers' participation was voluntary and without compensation. A review of lesson plans and student assessments was also conducted of the same teacher participants.

Instruments

Observation Instrument

Three sources of data collection were utilized in this study including classroom observations, teacher interviews, and a review of lesson plans and student assessments from both teaching methods. The purpose of the classroom observations within the study was to determine the pedagogical characteristics of the teachers at the secondary level

who used the online and face-to-face teaching modes in the secondary blended learning classroom.

The Secondary Teachers Analysis Matrix (STAM) (Gallagher & Parker, 1995; Salish I Research Collaborative, 1997) was used as the classroom observation instrument. The STAM is an observation rubric, which classifies teaching on a continuum between didactic instruction and constructivist inquiry instruction in five categories of classroom teaching including content, teachers' actions and assessments, students' actions, resources, and the classroom environment as shown in Table 1. Table 1 details the teaching styles as described in the STAM protocol.

The classification for each teaching style is empirically based, developed from research literature on classroom interactions between students and teachers, teacher knowledge and beliefs, constructivism, and the personal experiences of the developers of the STAM (Adams & Krockover, 1999). The researchers involved in the Salish I Research Project agreed with the STAM rubric's organization and content, indicating its content validity. Inter-rater reliability (Miles & Huberman, 1994) on four videotapes was $r = .83$, using two coders at the research site. Check-coding reliability (Miles & Huberman, 1994) with a time delay of six weeks was $r = .86$. These values are significantly greater than per chance since there are six choices for each of the 22 dimensions in the STAM observation rubric. Therefore, this is an indication that "more than one observer agrees that the perceived phenomena does exist" (Lauer & Asher, 1988, p. 138), verifying the reliability of the STAM instrument.

Table 1

STAM Categories and Subcategories

Major Category	Subcategory by Number
Content	1. Structure of content
	2. Use of examples and connections
	3. Limits, exceptions, and multiple interpretations
	4. Processes and history
Teacher's Actions And Assessments	5. Teaching methods
	6. Labs, demonstrations, and hands-on activities
	7. Teacher-to-student interaction
	8. Teacher questions
	9. Kinds of assessment
	10. Uses of assessment beyond grading
	11. Teacher's response to students' ideas
Student Actions	12. Writing and other representations of ideas
	13. Students' questions
	14. Student-to-student interactions
	15. Student-initiated activity
	16. Students' understanding of teacher expectations
Resources	17. Richness of resources
	18. Uses of resources
	19. Access to resources
Environment	20. Locus of decision-making
	21. Teaching aids displayed
	22. Students' work displayed

Source: Salish I Research Project Supplement, 1997, Instrument Package and User's Guide.

The protocol this researcher utilized with the STAM observation instrument follows a three-step process. First, the researcher observed three classroom teachers in a blended learning environment instructing two 90-minute blended class sessions using both face-to-face and online teaching methods within a two day time period. While observing the lesson, the researcher recorded information on the STAM Record of Activity Sheet. Data included the date, activity/transition, time of activity/transition, and description of the activity/transition. Each segment of the teacher's lesson was denoted as an activity or a transition. Activities are the fraction of the class session when subject matter content is taught. Transitions are the fractions of the class session defined as the beginning or ending of an activity.

Second, the researcher documented the observations via field notes and anecdotal records, noting students' behavior, students' activities and tasks, teachers' behaviors, student-to-student interaction, and teacher-to-student interaction. Third, the researcher reviewed the data per teacher in each educational context and wrote a brief narrative of the lesson content, the teacher's actions, the student's actions, the resources, and the classroom environment. The researcher provided a summary of each teacher to determine which type of teaching style is present in each classroom based on approximately three hours of observation in the blended learning classroom with the teacher using both the face-to-face and online teaching method using the STAM observation rubric.

Interview Protocol

The researcher interviewed each teacher involved in the classroom observations. The interviews were designed to determine teachers' pedagogical beliefs and knowledge to compare their answers to the data and information gathered from the classroom

observations. Extant research suggests that teacher beliefs influence their perceptions, which then affect their classroom practices, or pedagogy (Pajares, 1992). Although the Salish I Research Collaborative (1997) utilized the TPPI as the interview protocol primarily to determine the effectiveness of teacher preparation programs, it was generally designed to investigate how teachers' beliefs and experiences influence classroom practices.

Since the study explored teachers' pedagogical beliefs and their possible influence on the teachers' pedagogical practices, the researcher chose to use the TPPI as the interview protocol. Based upon the relevancy to the study, select questions were chosen from the Salish I Research Project's Teachers' Pedagogical Philosophy Interview (TPPI) (Richardson & Simmons, 1994) instrument. The interview questions were selected from the TPPI with the assistance of an expert panel to ensure their validity. The expert panel included educational technology specialists directly involved with teaching online learning programs at the secondary level as well as researchers at the higher education level.

The interviews were conducted by phone and audio recorded. Teachers signed an informed consent indicating their knowledge of the recording and each interview session began with the interviewee acknowledging that he or she agreed to be recorded. The researcher transcribed the audio recorded interviews and analyzed the specific questions using the Coding Scheme for the TPPI (see Appendix B for the TPPI Instrument questions and Coding Scheme).

Course Document Review

The document review involved the examination of the instructional documents, including lesson plans, student assessments, assignment sheets, and other course material. Research Question 1 provided the focus for the review of the class materials:

> What are the pedagogical characteristics of teachers in the secondary blended classroom setting when teaching in the face-to-face mode versus the online mode with the same group of students?

This study's review of instructional materials offered additional insight into the pedagogical styles used in the classroom based on the observation matrix continuum of didactic teaching to constructivist teaching. Trends and patterns were noted of the various teaching styles utilizing the lesson plans, the class assignments, and the student assessments.

The review of materials was used in conjunction with other qualitative research methods in order to triangulate the data surrounding a specific phenomenon (Denzin, 1970). Qualitative research uses more than one source of evidence to gain corroboration and confirmation of results. By triangulating the data, a combination of multiple data sets increases reliability (Eisner, 1991). Triangulation of data reduces the impact of potential bias from entering the study if only one method or one source were used in the study.

There are several uses of document analyses in research studies. This study used a document review as a means to provide supplementary research data for information not available in a cross-sectional research design in an instructional setting (Bowen, 2009). These course documents, including lesson plans, student assessments and class assignments, expanded the view of the instructional process to include the preparation

and planning process, and the assessment or evaluation period of the instruction. They provided additional information related to the pedagogical styles and practices commonly or consistently used within the classroom or within a particular setting.

Data Analysis

Observation Data Analysis

Three teacher participants were observed for two class sessions each in a blended learning environment during the spring 2012. During the blended class sessions, two distinctive teaching methods were used – the face-to-face delivery method and the online delivery method. The same group of students participated with the same teacher participant. Each class session totaled 90 minutes each; therefore each teacher participant was observed for a total of three hours per course. Duggan-Haas, Gallagher, and Parker (2004) recommend using three hours of classroom observations with each participant when using the STAM instrument.

The researcher used the Secondary Teachers Analysis Matrix (STAM) (Gallagher & Parker, 1995; Salish I Research Collaborative, 1997) observation instrument to determine the participants' teaching practices in each classroom setting. Each segment of the participants' lessons was defined as transitional or activity based instruction. Transitional portions of the class session were considered the beginning or ending of an activity, whereas activities were defined as content instruction. All activities and transitions were recorded on the Activity/Transition Timeline Sheet (see Appendix C for the STAM Record). The transitions and activities were then coded using the STAM Analysis Matrix.

The summary STAM scores for each participant and respective teaching mode were then compiled into a table. The STAM instrument denotes each teaching style with a letter: didactic is A; transitional is B; conceptual is C; early constructivist is D; experienced constructivist is E; and, constructivist inquiry is F. The STAM numerical averages were calculated for the five categories of the rubric: content, teachers' actions and assessments, students' actions, resources, and environment.

The calculation of the simple numerical average, an ordinal number ranging between one and six was assigned to each of the following styles: didactic (1); transitional (2); conceptual (3); early constructivist (4); experienced constructivist (5); and, constructivist inquiry (6). To determine the STAM content average for each participant, the coded subcategories (1-4) were assigned the corresponding ordinal number. Those items were then added and divided by four.

To determine the STAM teachers' actions and assessments average for each participant, the coded subcategories (5-11) were assigned the corresponding ordinal number. Those items were then added and divided by seven. To determine the STAM students' actions average for each participant, the coded subcategories (12-16) were assigned the corresponding ordinal number. Those items were then added and divided by five. To determine the STAM resource average for each participant, the coded subcategories (17-19) were assigned the corresponding ordinal number. Those items were then added and divided by four. To determine the STAM environment average for each participant, the coded subcategories (20-22) were assigned the corresponding ordinal number. Those items were then added and divided by two. The STAM content, teachers'

actions, students' actions, resource, and environment averages of all participants in both educational contexts were displayed in a table and on a bar graph.

Interview Data Analysis

Each interview was audio recorded and transcribed. The Teachers' Pedagogical Philosophy Interview (TPPI) (Richardson & Simmons, 1994) instrument was used as the interview protocol in this study. There were three levels of analysis in the final scheme to code the answers to the questions from the TPPI.

The first level of analysis was to analyze each question using a coded concept map. Each statement on the coding map was a category for the data generated from the interview transcript. The researcher used a priori coding for the coding maps. The Salish Research Collaborative developed the coding maps as a component of the STAM protocol. Each category included a code number and a letter associated with it. The code number represented the question number in the interview protocol and the letter represented a theme within the answer to that question. The transcripts were reviewed; each answer that aligned with a concept on the map was highlighted and coded. The analysis method followed the Coding Scheme for TPPI Level I Analysis (see Appendix B for Level I Coding Scheme).

The second level of analysis of the TPPI coding scheme was formatted in a matrix. The TPPI Super Code matrix consisted of rows and columns to delineate the teaching styles from the STAM and the five categories of the "aspects of the classroom" (see Appendix B for Level 2 Coding Scheme). After the matrix was completed, the researcher interpreted the data into narrative paragraphs for each section measured by the TPPI.

The third level of analysis of the TPPI coding scheme was also formatted in a matrix. The categories from the second level of analysis were condensed into another series of super code categories. Didactic and transitional codes were combined into a teacher-centered category, the conceptual code remained in a conceptual category, and the early constructivist, experienced constructivist, and constructivist inquiry codes were combined into a student-centered category.

Course Document Review

The review of the classroom documents involved content analysis and thematic analysis. Content analysis organizes information into categories related to the research question. Content analysis required the researcher to skim the documents first, then thoroughly examine the documents, and lastly, interpret the documents. It is important to note that this process is iterative since the first time the researcher reviews the documents, relevant areas of the documents are identified and irrelevant areas are separated (Corbin & Strauss, 2008).

Thematic analysis distinguishes patterns in the data and codes the themes and categories (Fereday & Muir-Cochrane, 2006). This is a focused review of the data involving a re-reading of the information in order to code and categorize the data. The codes utilized in the Secondary Teachers Analysis Matrix (STAM) (Gallagher & Parker, 1995; Salish I Research Collaborative, 1997) were also used in the document review of the lesson plans, student assessments, and class assignments. The researcher provided a summary of each set of documents to determine the type of teaching style reflected in the lesson plans and the student assessments and assignments.

Comparative Analysis Stage

Students' actions and teachers' actions were compared between the coded Secondary Teachers Analysis Matrix (STAM) observation data (Gallagher & Parker, 1995; Salish I Research Collaborative, 1997) and the Teachers' Pedagogical Philosophy (TPPI) (Richardson & Simmons, 1994) interview data. Both instruments used similar frameworks with identical descriptors of teaching style: didactic, transitional, conceptual, early constructivist, experienced constructivist, and constructivist inquiry. A simple numerical average was calculated based on the TPPI and STAM data for the teachers' and students' actions. To calculate the simple numerical average, an ordinal number from one to six was assigned to each of the teaching styles: didactic (1); transitional (2); conceptual (3); early constructivist (4); experienced constructivist (5); and, inquiry constructivist (6).

To determine the TPPI teacher's and students' actions average for each participant, the coded style responses were averaged. For example, if a participant had all teacher-action responses scoring in the didactic style of teaching, a number (1) was assigned. If, however, a participant had teacher-action responses coded within the didactic, transitional, and conceptual styles, then a number 1, 2, and 3 were assigned and then divided by three.

To determine the STAM teachers' actions average for each participant, the coded subcategories (5-11) were assigned to the corresponding ordinal number. Those items were totaled and divided by seven. To determine the STAM students' actions average for each participant, the coded subcategories (12-16) were assigned to the corresponding ordinal number. Those items were totaled and divided by five.

Lastly, the TPPI and STAM averaged data for all participants were displayed in a tabular format and a bar graph to illustrate the comparative analysis of the data. The measurements were displayed for each of the participants.

Protection of Human Subjects

Since this study utilized human subjects as participants, it was necessary to protect the subjects from harm, physically, mentally, and socially, and ensure that they participated in the research study of their own free will by informed consent. The adult participants were provided basic information about the study; the subjects then agreed to participate in the study by providing written documentation of their consent. The parents or guardians gave informed consent for the students observed in the classroom setting. Even after the informed consent was received from the parent or guardian, the subjects still had the right to decline participation in the study.

The researcher ensured that the participants were free from harm by not exposing them to undue risks. This required strict confidentiality of information by restricting access to information or data collected. Consent forms were kept for documentation purposes in a secure and restricted cabinet and transcribed interview notes were also maintained for the length of the study in a secure location.

Limitations

The limitations of the study design take several factors into account. First, the participants in the study are not representative of the entire public school teaching population since the school district must meet specific criteria of grade level and student enrollment status. The generalization of the data collected will only be linked to this

specific population. This study will consist of one high school, which is identified as a provider of blended learning to their full-time students in the school district.

The second limitation to the study design is the length of time in which the study will occur. As a descriptive research design, this study will utilize cross-sectional information. The data collected from the various methods in the study are limited, since they occur during a snapshot in time and cannot indicate a sequence of events related to outcomes. Therefore, it is impossible to infer causality with this research design.

A third limitation is the small number of teacher participants in the study. There are three teacher participants involved in the data collection, which may have an effect on the quantitative data analysis. A calculation of confidence intervals of the mean scores from the classroom observations will be calculated and presented as part of the results of the study.

A fourth limitation to the study design is that the Salish research instruments used in this study have never been employed in the blended learning environment, comparing face-to-face and online teaching methods. This is the first study to use the instruments in this educational context.

The fifth limitation concerns the researcher's identity. It is imperative to reveal the salient elements of the researcher's identity since they were, in essence, the human qualitative research instrument regarding data collection (Bogdan & Biklen, 2003). The researcher is an assistant principal at a neighboring school district who does not have pedagogical content knowledge expertise in the subject areas observed in the study. The researcher's interest in the research study is related to her educational background and training in graphic communications and technology as well as a professional interest in

studying the pedagogical characteristics of multiple learning contexts based on perceived student needs in the local public school systems.

Chapter Summary

This goal of this study was to describe the pedagogical approaches in the secondary blended learning classroom using both the online and face-to-face teaching methods with the same group of students. The descriptive research method was utilized and the qualitative and quantitative research methods were employed. Three types of data sources were gathered including classroom observations, teacher interviews, and a review of lesson plans, student assessments, and class assignments. Participants were chosen based on a predetermined set of criteria guided by the research questions. The study culminated in a comprehensive description of the pedagogical approaches used with the online and face-to-face teaching methods in a blended learning environment using both the qualitative and quantitative research methods.

CHAPTER 4

RESEARCH FINDINGS

Introduction

The purpose of this study was to describe the pedagogy teachers used when teaching in the face-to-face and online teaching modes in a secondary blended classroom. Specifically, the study compared the teaching practices of both modes with the same teacher and the same group of students. Furthermore, the study examined the extent, if any, the teachers' pedagogical beliefs had on the teaching practices of both the face-to-face and online teaching methods in the secondary blended classroom.

Data from three sources were used to describe and compare the face-to-face versus online teaching practices in the secondary blended classroom with the same group of students. The sources included classroom observations in the blended classroom, teacher interviews, and examination of lesson plans and student assessments.

The data collected from the teacher participants were used to answer the following research questions:

1. What are the teachers' pedagogical characteristics in the secondary blended classroom setting when teaching in the face-to-face mode versus the online mode with the same group of students?
2. To what extend if any, do teachers' pedagogical beliefs influence teaching practices in the secondary secondary blended classroom setting when teaching in the face-to-face mode versus the online mode with the same group of students?

Study Participants

The criterion for participation in this study was a secondary school offering blended learning (30-79% of the content is delivered online) to full-time students (Allen and Seaman, 2010). The teachers selected in the sample were those who instruct within the blended learning format in the selected high school. The study began by contacting school districts in eastern Pennsylvania to determine if they currently offer online learning (80% or more instruction delivered online) or blended learning (30-79% of the content is delivered online) in the high school to their full-time district students. The researcher and the school district administrator mutually selected the high school teachers to be observed through purposive sampling. The teacher participants who agreed to be observed in the classroom were also interviewed in a separate follow-up session. The teachers' participation was voluntary and without compensation. A review of lesson plans and student assessments was also conducted of the same teacher participants.

Course Document Review

Each teacher participant submitted lesson plans for the week in which the classroom observations occurred. They also submitted student assessments, assignments, and any other evaluation tools used during the class sessions observed. The researcher, using the content category of the Secondary Teachers Analysis Matrix (STAM), determined the teaching style reflected in the course documents. The document review for each teacher participant includes a two-paragraph summary; the first paragraph outlined the examination of the lesson plans and the second paragraph outlined the examination of the student assessments and assignments. A brief description of the associated teaching styles was included for each section.

Observation Data

The Secondary Teachers Analysis Matrix (STAM) (Gallagher & Parker, 1995; Salish I Research Collaborative, 1997) was the observation data instrument used for both teaching methods – the face-to-face and online teaching modes in the blended learning classroom. The STAM Record of Activity sheets were used to record the field notes of the classroom observation qualitative data (see Appendix C for the STAM Standard Operating Protocol). Each teacher participant was observed for two 90-minute blended learning classroom sessions in which the teacher used both the face-to-face and online teaching modes. The sessions were completed within a two-day timeframe and totaled three hours per teacher participant. The STAM Record of Activity sheet included the dates, times, transitions, and activities. The data recorded from the classroom observations were coded using a matrix of five main categories: content, teacher actions and assessments, student actions, resources, and environment. The matrix further delineated the five main categories into 22 subcategories. Table 1 illustrates the five main categories with their corresponding subcategories according to the STAM protocol.

As the classroom observation data were coded according to the descriptions provided on the detailed STAM matrix (see Appendix C for the STAM Standard Operating Protocol), the subcategories were placed within one of the six teaching styles listed on a continuum: didactic, transitional, conceptual, early constructivist, experienced constructivist, and constructivist inquiry.

The six teaching styles were defined by STAM authors Duggan-Haas, Gallagher, and Parker (2001):

A. Didactic teaching: teacher-centered teaching in a highly teacher-directed environment. Fact centered information transfer is the goal. Assessment only serves to grade students and is designed to determine if students received the information that was transmitted. Students are generally passive recipients of information, and didactic teachers are not usually concerned about students' ideas and reasoning when they prepare and deliver their information.

B. Transitional teaching: shows features of both didactic and conceptual teaching styles. Content is less fact-centered and is more comprehensive than didactic teaching. There are usually more teacher-to-student interactions occurring about content than in didactic teaching. Assessments have limited use in this type of teaching style beyond assigning grades. Environment and resources usually remain teacher-directed. This teaching style is usually observed in secondary classrooms as teachers present material to students and then ask questions or respond to student questions.

C. Conceptual teaching: concept-centered rather than fact-centered teaching. Teachers assist students to develop connections to concepts. Assessments are used as a tool for diagnosing student needs and areas of improvement instead of just for grade assignments. The classroom setting tends to be teacher-centered in the physical setting and use of resources.

D. Early Constructivist teaching: shifts from a teacher-centered approach to a student-centered approach. The students' ideas and reasoning become central to the interaction between the teacher and students. Assessments are the focus within

the classroom as the teacher determines the students' ideas and reasoning processes. The content and the pace of the instruction are affected by the assessment information. The physical setting of the classroom is changed to allow for group work. Writing becomes evident as an instructional tool in most constructivist classrooms.

E. Experienced Constructivist teaching: brings increased conceptual emphasis as the teacher guides the students into deeper understanding and connection of material. Teachers are more concerned about student understanding of instructional content than procedures. Continuous, embedded assessment is a central component to this style of teaching since teachers must understand students' ideas and reasoning in order to determine instructional activities. Much more responsibility and control of learning is given over to the students; however, the teachers still maintain monitoring of students' progress toward learning goals.

F. Constructivist Inquiry teaching: instruction has become self-sustaining inquiry. Student-centered inquiry is the foundation for both content choice and method of inquiry. The teachers are the guides for the students as they perform their investigations. Usually there are many investigations occurring simultaneously in the classroom, as students explore specific questions that have originated from the class. Whole class discussions may only occur as students present their work to their peers and the teacher for critique. Some class time is devoted to learning new data collection techniques and data analysis. Most of the class is spent on performing investigations, organizing and analyzing data, writing reports and reflections. (pp. 8-11)

These teaching styles were used as a basis for completing the STAM observation matrix for the participants. The principal researcher also completed a detailed six-paragraph Portfolio Summary based on the STAM Record of Activity data sheets for each teacher participant's classroom observation data for both teaching methods. The STAM Portfolio Summary included an initial paragraph describing the teacher's overall teaching style and five paragraphs specifying the categories of content, teacher's actions and assessments, students' actions, resources, and environment.

Lastly, the qualitative data from the STAM matrix was calculated into a simple numerical average. An ordinal number from one to six was assigned to each of the following styles: didactic (1); transitional (2); conceptual (3); early constructivist (4); experienced constructivist (5); and, constructivist inquiry (6). To determine the STAM content average for each participant, the coded subcategories (1-4) were assigned the corresponding ordinal number. Those items were then added and divided by four.

To determine the STAM teachers' actions and assessments average for each participant, the coded subcategories (5-11) were assigned the corresponding ordinal number. Those items were then added and divided by seven. To determine the STAM students' actions average for each participant, the coded subcategories (12-16) were assigned the corresponding ordinal number. Those items were then added and divided by five. To determine the STAM resource average for each participant, the coded subcategories (17-19) were assigned the corresponding ordinal number. Those items were then added and divided by three. To determine the STAM environment average for each participant, the coded subcategories (20-22) were assigned the corresponding ordinal number. Those items were then added and divided by three. The STAM content,

teachers' actions, students' actions, resource, and environment averages of all participants were displayed in a table for each teaching mode. The term, "wobble," indicated a score between the ordinal values (Brown, 2002). A number between 1 and 2 was reported as 1/2; a number between 2 and 3 was reported as 2/3, and a number between 3 and 4 was reported as 3/4. Value 1/2 signified a teacher participant's score wobbling between the didactic and transitional style; the value 2/3 signified the teacher participant's score wobbling between transitional and conceptual; the value 3/4 signified the teacher participant's score wobbling between conceptual and early constructivist; while, the value 4/5 indicated the teacher participant's score wobbling between the early constructivist and experienced constructivist.

Data Results

Course Document Summary

Each teacher participant's Course Document Summary included two paragraphs describing their lesson plans and student assessments, assignments, and other evaluation tools used during the classroom observation period. The content category from the Secondary Teaching Analysis Matrix (STAM) was used to determine the teaching style reflected in each teacher participant's documents from both teaching methods – the face-to-face and the online modes in the blended classroom setting.

STAM Portfolio Summary

Each teacher participant's STAM Portfolio Summary included six paragraphs under the subheadings overview, content, teacher's actions, student's actions, resources, and environment. The numerical values following each category within the overview paragraphs were the frequencies in which the participant observation data were coded.

The data coded from each teacher participant was also tabulated in a STAM Graphic Style Summary Table for each participant in both the face-to-face and online modes.

Course document summary for Julie (T1). Julie's (T1) lesson plans for the Spanish 1 class indicated that the goals for the week were to identify verbs, apply time-telling skills in oral and written exercises, ask questions by writing an interview, and apply vocabulary by writing simple sentences. The lesson plans included didactic level content of recalling vocabulary, introducing vocabulary through choral reading and filling out vocabulary sheets while reading text. The lesson plans also included other types of activities such as students interviewing other students, creating podcasts and wikis. These activities are reflective of the early constructivist style and are focused on student-centered learning.

The student assignments and evaluation tools for the face-to-face mode included at-the-bell worksheets for vocabulary recall, verb conjugation, and logic puzzles. The vocabulary recall sheet included basic factoids of information, reflecting a didactic teaching style, whereas the verb conjugation and logic puzzle activities were conceptual in nature and required students to apply their knowledge of the content. The student assignments and evaluation tools for the online mode were wiki, podcast, and video essay projects. These assignments share features of the experienced constructivist style. The students' ideas and content were used for these projects with the teacher's guidance. The teacher and the students identified alternate ways to interpret the individual assignments.

STAM portfolio summary (face-to-face) for Julie (T1).

Overview. The face-to-face mode in the Spanish 1 class focused on Spanish vocabulary for school and grammar concepts including –ar verb conjugation, colors, and

larger numbers. The face-to-face mode was dominated by transitional (11.5) and conceptual (7) styles with a few didactic styles (2.5), as shown in Table 2.

Content. 1B. The content organization was descriptive with vocabulary memorization given equal emphasis to verb conjugations in the larger concept of the Spanish language. 2C. The teacher used real-world examples and connections through the explanation of the assignment for the school newspaper. Students would be writing interview questions in Spanish to ESL students in their high school about their educational experiences in their native countries. 3C. Some limits, exceptions and alternate solutions were acceptable but it was dependent on the activity. One correct item was required with the at-the-bell worksheets but the interview questions would have multiple answers.

Teacher's actions and assessments. 5A. The teacher used teacher-centered instructional methods during the face-to-face mode. Students were given worksheets to complete and Spanish language listening exercises were employed as a whole group activity. 6A. There were no labs or hands-on activities in the face-to-face mode. The listening exercises combined a teacher demonstration component as the teacher modeled some of the pronunciations. 7B. Most of the student-to-teacher interaction involved the correctness of students' ideas regarding vocabulary and verb conjugations. 8B. The intent of the teacher's questions were to obtain the correct answers from the students. For example, when a student answered a question incorrectly from an at-the-bell worksheet, the teacher asked another student until she received the correct answer. The teacher then provided the reason for the correct answer (subject to verb agreement). 9C. The teacher

Table 2

Julie (T1) Summary of STAM Subcategories – Face-to-Face

STAM Major Category	STAM Subcategory Number	A. Didactic	B. Transitional	C. Conceptual	D. Early Con.	E. Exp. Con.	F. Con. Inquiry
Content (1-4)	1		■				
	2			■			
	3			■			
	4						
Teacher's Actions (5-11)	5	■					
	6	■					
	7		■				
	8		■				
	9			■			
	10		■				
	11		■				
	12		■				
	13		■				
Student's Actions (12-16)	14	○	○				
	15		■				
	16			■			
Resources (17-19)	17		■				
	18			■			
	19			■			
Environ-ment (20-22)	20		■				
	21		▪				
	22			■			

Note: The ■ indicates a full score in one area for that category; whereas, a ❍ indicates a half-score in two areas for that category.

monitored student progress through the class sessions through a variety of activities including at-the-bell exercises, listening activities, and logic puzzles. 10B. The students' knowledge was assessed as the teacher monitored their progress through the various class activities. 11B. The teacher attempted to reach consensus in the classroom during the logic puzzle activity.

Students' actions. 12B. Writing and other means of representing student ideas were occasionally used in the face-to-face mode including short-answer worksheets and responses to the listening exercises. 13B. Student questions were mostly procedural and clarifying such as "what does 'un punto' mean?" or "should we write our questions first and then go on the wiki?" 14A, 14B. For the most of the face-to-face mode, student-to-student interaction was rare. There was one brief activity involving student-to-student interaction in which social interaction was predominant with a few procedural questions asked among the student groups, such as "what page are we on?" 15B. Students volunteered examples when discussing the class wiki and the newspaper article questions. 16C. Most of the students accepted the role of procedures and rules in the classroom. There were some students who appeared confused during the logic puzzle activity and during the language listening exercise; students got up out of their seats to get tissues, they looked at other materials instead, they raised their hands repeatedly to the wrong questions.

Resources. 17B. The resources in the face-to-face mode included verb conjugation worksheets, audio materials such as the computer with speakers, and the logic puzzles. 18C. The resources were related to the content material. 19C. The teacher mainly controlled the face-to-face classroom resources by distributing the materials to the

Table 3

Julie (T1) Summary of STAM Subcategories – Online

STAM Major Category	STAM Subcategory Number	A. Didactic	B. Transitional	C. Conceptual	D. Early Con.	E. Exp. Con.	F. Con. Inquiry
Content (1-4)	1				■		
	2				■		
	3				■		
	4						
Teacher's Actions (5-11)	5					■	
	6				■		
	7			■			
	8				■		
	9				○	○	
	10			○	○		
	11				■		
Student's Actions (12-16)	12					■	
	13			○	○		
	14				○	○	
	15			■			
	16			○		○	
Resources (17-19)	17					■	
	18					■	
	19					○	○
Environ-ment (20-22)	20					■	
	21		■				
	22			■			

Note: The ■ indicates a full score in one area for that category; whereas, a ❍ indicates a half-score in two areas for that category.

students on an as needed basis.

Environment. 20B. The teacher made most of the classroom decisions without the students' contribution. 21B. Some of the teaching aids were displayed regarding the Spanish culture and the Spanish language. They were not necessarily related to this particular unit's content. 22C. Student work was displayed on the walls and was hanging from the ceiling.

STAM Portfolio Summary (Online) for Julie (T1).

Overview. The online teaching mode in a Spanish 1 course focused on project-based learning. The project skills targeted Spanish vocabulary for school and grammar concepts including –ar verb conjugation. The online mode was dominated by early constructivist (8) and experienced constructivist (7) styles with some conceptual teaching styles (4.5), as shown in Table 3.

Content. 1D. The teacher and students' negotiated understanding of the key ideas with the teacher's content emphasized. For example, students were given an assignment to compare two videos, which were posted online by the teacher; students were to write a paragraph in Spanish about the videos demonstrating their understanding. 2D. The teacher led the students using examples and made connections to real-world examples by simulating the online community in the physical classroom. The teacher encouraged students to work on the procedural components of the online assignments without direct teacher assistance; the teacher instead acted as the facilitator and answered questions related to the Spanish language and the projects. 3D. The teacher guided the students to identify ways of finding alternate solutions. The teacher answered student questions and found resources for the students as they worked on the assignments. For example, a

student was not sure how to create a podcast in GarageBand; the teacher directed him to a You Tube video she posted online explaining the steps of podcast creation.

Teacher actions and assessments. 5E. There was extensive use of student-centered technology teaching methods including writing, podcasting, blogging, video comparisons, group work, online educational games, and online assessments. 6D. Investigations and other hands-on activities were developed and implemented by the teacher. 7C. The teacher-to-student interaction involved the correctness of the students' knowledge of concepts, focused on the verb conjugations on the online quiz and the grammar and vocabulary within the interview questions for the wiki blog. 8D. The teacher's questions were meant to clarify students' ideas about the projects. 9D, 9E. The teacher used multiple methods to assess student knowledge and understanding including online quizzes, wikis, blogs, podcasts, and online educational games. 10C, 10D. Students' knowledge was checked through assessments but the teacher also used the assessments as a tool to modify the activities and assignments in the course. 11D. The teacher occasionally considered student input when making instructional decisions; this was observed several times including the re-taking of the online quiz for mastery as well as the posting of the You Tube video demonstrating podcasting techniques.

Student actions. 12E. Writing and other representations of student ideas were frequently used in the online mode including the listening exercise for the podcast, the newspaper/interview questions for the wiki, the online quiz short-answers, and the comparison essay of the two Spanish videos. 13C, 13D. Students asked the teacher questions specifically related to the Spanish language and the –ar verb conjugations; very few questions were procedural during the online teaching mode. 14D, 14E. Student-to-

student interaction during the online mode included collaborative group work in which students were assisting each other with questions about the assignments, navigating the Blackboard website, and asking each other questions about the Spanish language; they were fairly self-reliant. 15C. Students volunteered some examples related to the class activities but only within their self-created groups. 16C, 16E. Most of the students accepted the classroom procedures and roles, especially when the online quiz was being administered. During most of the online teaching mode, the students set the pace of the class with the teacher facilitating and supporting the students.

Resources. 17E. There were a variety of resources utilized during the online class mode including laptop computers, the SmartBoard, headphones, videos, and other technology components. 18E. Resources were intended to assist in students' application of content material. 19E, 19F. Access to the resources were based on what was needed to complete the assignments. For example, when students were recording their podcasts, a student asked the teacher if he could retrieve the necessary components to complete the podcast in the classroom, while other students asked to go in the hallway to record themselves without the need for the auxiliary components.

Environment. 20E. The student made decisions about how they spent the class time with the teacher. The students worked on different projects simultaneously. The projects to be completed by the students were announced by the teacher at the beginning of the online class mode; the teacher created the projects. 21B. Some of the teaching aids were displayed regarding the Spanish culture and the Spanish language. They were not necessarily related to this particular unit's content. 22C. Student work was displayed on the walls and was hanging from the ceiling.

Table 4

Robert (T2) Summary of STAM Subcategories – Face-to-Face

STAM Major Category	STAM Subcategory Number	A. Didactic	B. Transitional	C. Conceptual	D. Early Con.	E. Exp. Con.	F. Con. Inquiry
Content (1-4)	1			■			
	2			■			
	3				■		
	4						
Teacher's Actions (5-11)	5	■					
	6	■					
	7			○	○		
	8			■			
	9			■			
	10			■			
	11			■			
Student's Actions (12-16)	12	■					
	13			■			
	14			■			
	15		○	○			
	16			■			
	17			■			
Resources (17-19)	18	■					
	19	■					
Environ-ment (20-22)	20		■				
	21		▪				
	22			■			

Note: The ■ indicates a full score in one area for that category; whereas, a ❍ indicates a half-score in two areas for that category.

Course document summary for Robert (T2). Robert's (T2) lesson plans for the AP United States History class outlined the outcomes and activities for Chapter 14. He included the chapter test, the podcast lecture, group work, note taking, and student presentations. The lesson plans did not specify which activities were particular to the face-to-face and online teaching modes, which is indicative of a blended learning environment. The lesson plans included both a didactic type of instructional strategy in which the students took notes on the start of the Civil War using Power Point and videos. The lesson plans also included early constructivist teaching strategies including cooperative learning groups for an activity involving the Civil War podcast lecture. This activity is more student centered than the didactic style lecture.

The student assignments and evaluation tools from Robert's online class mode included an online assessment, a Yale podcast lecture, and a group project assignment based on the podcast lecture. They were all associated with the early constructivist teaching style. The content involved students' demonstrating their understanding of key ideas with the teacher's content emphasized. The students' assignments used real-world examples associated with the Civil War and the events leading up to this time period. These activities were more student-centered compared to the note-taking activities in the face-to-face teaching mode.

STAM portfolio summary (face-to-face) for Robert (T2).

Overview. The face-to-face mode in the AP United States History class focused on reviewing and testing for the last chapter as well as new lesson information regarding the start of the Civil War. The face-to-face mode was dominated by conceptual (12) and didactic (5) styles with a few transitional (2.5) styles, as shown in Table 4.

Content. 1C. The content material was explanatory with historical concepts organized around the key ideas and events. 2C. The teacher used examples and connections to real-world events. The students were learning about the soldiers who fought in the Civil War; the teacher provided examples of their daily lives including trading goods and entertainment before battle. 3D. The teacher guided the students to develop alternate questions for review and gave them to another student to answer; students then shared solutions or answers to the test review activity. The students created their own test with each other why their answer was the better choice.

Teacher's actions and assessments. 5A. The teacher used teacher-centered instructional methods during the face-to-face mode. The lesson was presented in a lecture-style format with students taking notes while the teacher presented the information at the front of the classroom. 6A. There were no labs or hands-on activities in the face-to-face mode. The teacher presented the lesson at the physical front of the classroom with students seated in their desks, copying notes. 7C, 7D. The student-to-teacher interaction involved the correctness of students' knowledge regarding historical figures but also the students' understanding and application of the concepts. At one point, the teacher showed the class a map of the United States after the Battle of Fort Sumter; there was considerable discussion involving the Emancipation Proclamation and its effect on the various states. 8C. The intent of the teacher's questions were to connect students' knowledge with the historical concepts. The teacher asked the two guiding questions: What did the South fight for and what did the North fight for? These questions generated others involving values, ideals, and religion. 9C. The teacher frequently checked student knowledge through a variety of activities including review exercises and document-

based-questions. 10C. The students' knowledge and preplanning was assessed through the various class activities. 11C. The teacher regularly asked students for their opinions regarding the subject matter but attempted to change or correct their answers if he thought they were incorrect.

Students' actions. 12A. Writing and other means of representing student ideas were not used in the face-to-face mode; students copied down notes. 13C. Student questions clarified procedures but also were related to specific concepts. For example, one student asked, "What happens when we're done with our partners?" whereas, in another instance a student asked, "Did the Emancipation Proclamation cause conflict with the states that were loyal to the Union?" 14C. The students had partnered together for the review of the exam. Their interaction involved both procedures and clarification of content material. 15B, 15C. Students volunteered examples during the face-to-face class mode. Some of them were directly related while others had a weak connection. 16C. Most of the students accepted the role of procedures and rules in the classroom. There was one student during the movie who did not appear interested and instead started his own conversation about West Point.

Resources. 17C. Multiple resources were utilized in the face-to-face mode including the Smart Board, Power Point, a movie with audio, and the television as a secondary screen source. 18A. The resources were related to the content material; however, students only looked at them passively and did not actively use them during the face-to-face mode. 19A. The teacher controlled the resources during the face-to-face mode since they were all technology-based and located at the physical front of the classroom.

Environment. 20B. The teacher made most of the classroom decisions without the students' contribution. 21B. Some of the teaching aids displayed were related to history in some regard but they were not necessarily associated to this lesson or unit. 22C. Student work was displayed on the walls and the white board.

STAM portfolio summary (online) for Robert (T2).

Overview. The online mode in the AP United States History course focused on project-based learning; specifically, the creation of student presentations related to the start of the Civil War. The online mode was dominated by the experienced constructivist (7.5) and early constructivist (6.5) styles with some conceptual teaching styles (4), as shown in Table 5.

Content. 1D. The teacher and students' negotiated understanding of the key ideas with the teacher's content emphasized. For example, as the students worked on their presentations, the teacher and the students discussed the content material in the historical context using the book, "The Guns of August." 2E. Students made connections to real-world events and main ideas of the content material through creation of the presentations. They researched the information needed from the Yale professor's podcast lecture about the start of the Civil War and then they developed their own innovative way of presenting the material. 3D. The teacher guided the students to identify ways of finding alternate solutions. The teacher provided suggestions to the student groups regarding the introduction and conclusion for the overall class presentation. He told them to watch the podcast lecture preceding the first section and the lecture following the last section of the assignment to gain a comprehensive understanding of the material.

Teacher actions and assessments. 5D. There were a variety of technology-based student-centered teaching methods including hands-on activities, writing, developing presentations, group work, and online assessments. 6D. Investigations and other hands-on activities were developed and implemented by the teacher. Student groups will be giving a creative presentation to the class based on the information the teacher assigned from the various sections of the Yale podcast lecture. 7C, 7D. The teacher-to-student interaction involved the correctness of the students' knowledge of concepts as well as the clarification of students' understanding of the content material. The student-to-teacher interaction was varied during the online mode – students were taking the online examination compared to when they were engaged in the group presentation activities. The teacher answered specific questions related to overall conceptual knowledge during the testing period whereas, the activity period involved application of ideas and historical references. 9E. The teacher used multiple methods to assess student knowledge and understanding including online examinations and student-created presentations. 10D, 11D. The teacher solicited information about the activities from the students to potentially adjust the activities in the future.

Students' actions. 12F. Students were able to choose from a variety of writing forms and other ways of representing their ideas in the online mode including creating a podcast, a movie, a Power Point presentation, a Prezi presentation, an XtraNormal presentation as well as their online exam short-answers. 13C, 13E. Students asked the teacher both procedural questions as well as content application questions. For example, one student asked, "Do we have to use Firefox" whereas another student asked, "How does the *Guns of August* pertain to this period of history?" 14E. Student-to-student

Table 5

Robert (T2) Summary of STAM Subcategories – Online

STAM Major Category	STAM Subcategory Number	A. Didactic	B. Transitional	C. Conceptual	D. Early Con.	E. Exp. Con.	F. Con. Inquiry
Content (1-4)	1				■		
	2					■	
	3				■		
	4						
	5				■		
	6				■		
Teacher's Actions (5-11)	7			○	○		
	8						
	9					■	
	10				■		
	11				■		
Student's Actions (12-16)	12						■
	13			○		○	
	14					■	
	15			■			
	16					■	
Resources (17-19)	17					■	
	18					■	
	19					■	
Environ-ment (20-22)	20			■			
	21		■				
	22			■			

Note: The ■ indicates a full score in one area for that category; whereas, a ❍ indicates a half-score in two areas for that category.

interaction during the online mode included group work where students delegated tasks, researched the content, chose technology resources, began designing a presentation about the start of the Civil War; they were very self-reliant. 15C. Students volunteered some examples related to the class activities but only within the teacher-assigned groups. 16E. During the online mode, the students generally set the pace and the tone of the classroom while the teacher acted as the facilitator and supporter of resources. Students chose where they sat, decided on the type of technology to use, and the way they used the class time for completion of the project activities.

Resources. 17E. There were a variety of resources utilized during the online class mode including laptop computers, the SmartBoard, headphones, videos, Smartphones, and other auxiliary technology components. 18E. Resources were intended to assist in students' understanding and application of content material. 19E. Access to the resources were based on what was needed to complete the assignments. Students used whatever technology they needed and they used the classroom space however they chose for the assignment and group work to be accommodated.

Environment. 20D. Teacher and students shared control over time during the online mode. Together, the teacher and students determined which projects need to be completed prior to the end of the online mode. 21B. Some of the teaching aids displayed are related to history in some regard but they are not necessarily associated to this lesson or unit. 22C. Student work is displayed on the walls and the white board.

Course document summary for Joseph (T3). Joseph's (T3) lesson plans for the Psychology class outlined the goals and standards associated with parenting skills and their influence on children. The lesson plans identified teacher-created materials such as a

Power Point presentation, notes, hand-outs. Other materials listed were videos, textbooks, and computers. The lesson plans reflected the didactic teaching style through the lecture portion of the class in which the students took notes and watched a video about psychological disorders in parents and their effect on children. The lesson plans also delineated student group work using computers to research a problem-based activity and continue working on student presentations. These activities shared features of the early constructivist teaching style where student-centered teaching methods predominate.

Joseph's student assignments included notes from the Power Point presentation and a problem-based activity sheet. The notes mirrored the didactic teaching style from the face-to-face mode. The problem-based activity sheet required students to research their ideas and come to consensus with their partners to prove or disprove statements regarding child development. This is a reflection of the early constructivist teaching style in which students' applied content knowledge and real-world examples of child development. The student assignments in the online mode were more student-centered compared to the note-taking exercises in the face-to-face mode.

STAM portfolio summary (face-to-face) for Joseph (T3).

Overview. The face-to-face mode in the Psychology class focused on parenting styles and a brief overview of child abuse in the context of psychology and child development. The face-to-face mode was dominated by conceptual (11) and transitional (6.5) styles with a few didactic (4.5) teaching styles, as shown in Table 6.

Content. 1B, 1C. The lessons were structured with both descriptive and explanatory content. In some instances, the teacher presented the information using basic facts and recall and at other times, he made connections to the overall conceptual view of

Table 6

Joseph (T3) Summary of STAM Subcategories – Face-to-Face

STAM Major Category	STAM Subcategory Number	A. Didactic	B. Transitional	C. Conceptual	D. Early Con.	E. Exp. Con.	F. Con. Inquiry
Content (1-4)	1		○	○			
	2			■			
	3			■			
	4	■					
Teacher's Actions (5-11)	5	■					
	6		■				
	7	○		○			
	8		■				
	9		■				
	10		■				
	11			■			
Student's Actions (12-16)	12	■					
	13			■			
	14		■				
	15			■			
	16			■			
Resources (17-19)	17			■			
	18			■			
	19			■			
Environ-ment (20-22)	20	■					
	21		■				
	22			■			

Note: The ■ indicates a full score in one area for that category; whereas, a ❍ indicates a half-score in two areas for that category.

the lesson. 2C. The teacher provided real-world examples when making connections to the materials. On many occasions, he related personal stories of real-events to link the psychology components and the parenting styles. He also showed a brief video of a real-world example of a young mother with obsessive compulsive disorder and the effect it had on her parenting style and her child. 3C. The teacher explained the limits and exceptions of the content material to the students while he described the various parenting styles and their definitions and applications. 4A. In the face-to-face mode, the teacher did not present the content information of "how the information is known," rather it was presented as it is known as fact.

Teacher's actions and assessments. 5A. The teacher used teacher-centered instructional methods during the face-to-face mode. The lesson was presented in a lecture-style format with students taking notes while the teacher presented the information at the front of the classroom. 6B. There were two students who gave a presentation during the face-to-face mode; however, it was not connected to the day's lesson. 7A, 7C. Depending on the timeframe of the class session, the teacher-to-student interaction was either non-existent, with the teacher lecturing the information to the whole group or, as in another lesson, the student-to-teacher interaction involved the correctness of students' knowledge regarding parenting styles. 8B. The teacher's questions focused on knowledge as he was teaching the lesson. For example, he asked the class, "What type of parenting do you see in your own realm?" versus "What are your thoughts about the young mother in the video?" 9B, 10B. The teacher checked student knowledge by verbal assessment of question and answer throughout the face-to-face mode. 11C. The teacher asked students for their opinions regarding the subject matter but

corrected their answers if he thought they were incorrect.

Students' actions. 12A. Writing and other means of representing student ideas were not used in the face-to-face mode; students copied down notes. 13C. Students asked the teacher questions clarifying current events. 14B. Student-to-student interactions during the face-to-face mode were minimal; those that occurred were either social or involved procedural questions involving the content. 15C. Students volunteered examples during the face-to-face mode and related them to the lesson material. 16C. Students accepted the role of procedures and rules in the classroom. As the two students gave their presentation to the class, the other students were attentive.

Resources. 17C. There were multiple resources utilized in the face-to-face mode including the Smart Board, Power Point, and a movie with audio. 18C. The resources were related to the content material and some of the students accessed the resources during the face-to-face mode. 19C. The teacher controlled the access to the resources during the face-to-face teaching mode; however, the students who gave the presentation were able to access the resources they needed to show their project.

Environment. 20A. The face-to-face teaching mode is teacher-dominated. The teacher is in control of the classroom and made the classroom decisions without the students' input. 21B. Some of the teaching aids displayed are related to history but are not associated to Psychology. 22C. Student work is displayed throughout the classroom.

STAM portfolio summary (online) for Joseph (T3).

Overview. The online mode in the Psychology course focused on a problem-based activity; specifically, accessing resources including technology to find an alternate solution to problems focused on parenting and child development. The online mode was

dominated by the early constructivist (11) and conceptual (6) teaching styles with a few experienced conceptual (3) teaching styles (6), as shown in Table 7.

Content. 1C. The content was explanatory as the concepts were organized around the main ideas of parenting and child development. 2E. Students made connections to real-world events and main ideas of the content material through previous experience and knowledge as the students discussed the information they gathered and organized for the project. 3D, 4C. The teacher required the students to provide alternative solutions to the answers they wrote and discussed as long as they explained how they had gotten to those conclusions.

Teacher actions and assessments. 5D. There are several technology-based and student-centered teaching methods including hands-on activities, writing, group work, and consensus team-building skills. 6D. Students' ideas were incorporated into the problem-based activities. The teacher had the students pair together for the assignment. 7D. The teacher-to-student interaction was based on the students' understanding of concepts. 8C. The teacher's questions asked for connection to the ideas and problems presented in the group activity in the online mode. For example, the teacher asked, "Do you think all human behavior is learned?" Then he probed, using the follow-up question, "How do you know?" 9B. The teacher used verbal question and answer, group discussion, and written representation of student ideas to check for student knowledge of material. 10D, 11D. The teacher determined how much information and which concepts the students understood before moving on in the lessons and activities; the teacher sought out the students' ideas and knowledge regarding the material and adjusted the plans accordingly.

Table 7

Joseph (T3) Summary of STAM Subcategories – Online

STAM Major Category	STAM Subcategory Number	A. Didactic	B. Transitional	C. Conceptual	D. Early Con.	E. Exp. Con.	F. Con. Inquiry
Content (1-4)	1			■			
	2					■	
	3				■		
	4			■			
Teacher's Actions (5-11)	5				■		
	6				■		
	7				■		
	8			■			
	9		■				
	10				■		
	11				■		
Student's Actions (12-16)	12				■		
	13					■	
	14				■		
	15					■	
	16			■			
Resources (17-19)	17			■			
	18				■		
	19				■		
Environ-ment (20-22)	20				■		
	21		■				
	22			■			

Note: The ■ indicates a full score in one area for that category; whereas, a ❍ indicates a half-score in two areas for that category.

Students' actions. 12D. Students wrote their ideas and opinions of the content during the online mode. In their student-created groups, they had to make connections to the past information they received and prove or disprove myths about parenting and child development. 13E. Students asked questions that connected and applied the content. For example, a student asked the teacher if the parenting styles are generation specific. The teacher then clarified, "Do you mean, are we moving toward a more permissive society as a response to outright disobedience?" 14D. There are some student-to-student interaction during the online mode in which the students applied their knowledge. During the group work, the students had to come to consensus regarding their answers proving or disproving the myths of parenting and their reasons why they chose the answers. 15E. Students not only volunteered examples related to the class activities but they also provided a brief analysis of their answers. 16C. Students followed the rules of the classroom and accessed the technology when asked by the teacher.

Resources. 17C. Multiple resources were used during the online mode including laptop computers, the SmartBoard, textbooks, the Internet, previous class notes, groups members and other auxiliary technology components. 18D. Resources were specifically meant for students' understanding and application of content material. 19D. Access to the resources were guided by the teacher. Students used the resources they needed to complete the assignment.

Environment. 20D. Students and the teacher made some joint decisions on the time and activities during the online mode. Together, they determined how much time was used toward completing the online projects. 21B. Some of the teaching aids displayed are related to history but they are not associated to Psychology. 22C. Student

work is displayed throughout the classroom.

Interview Data

The principal researcher asked the three teacher participants thirteen selected questions from the Teachers' Pedagogical Philosophy Interview (TPPI) (Richardson & Simmons, 1994). From the thirteen questions, eight questions were coded into three categories: teacher's actions (TA); students' actions (SA); and, philosophy of teaching (PT). The thirteen questions and those with corresponding coding category(s) were:

1. How would you describe yourself as a classroom teacher?
2. Describe a well-organized classroom. (TA)
3. How did you form this model of the well-organized classroom?
4. How do you know when you have learned? (PT)
5. How do you decide what to teach and what not to teach? (TA)
6. How do you decide when to move from one concept to another? (TA)
7. What learning in your classroom do you think will be valuable to your students outside the classroom? (PT)
8. In what way do you try to model the best teaching/learning situation in your classroom? (PT)
9. How do you believe students learn best? (SA & PT)
10. How do you know when student learning is occurring or has occurred in your classroom? (SA)
11. In what ways do you manipulate the educational environment to maximize student learning? (TA & SA)
12. What values do you want to develop in your students?

13. How do you define technology?

There were three levels of coding which were completed according to the TPPI protocol. The coding scheme for the TPPI protocol involved a priori coding, which were developed by the Salish Research Collaborative team in 1995.

The first level of coding analysis was presented in a coding map. Most of the TPPI questions each had a coding map. Each map included several statements, which indicated coding categories for data taken from each interview transcript. Each category or statement had a corresponding number and letter, which aligned with the TPPI supercode matrix in the second level of the analysis.

The second level of analysis of the TPPI coding scheme involved further coding of the questions. The six codes of didactic, transitional, conceptual, early constructivist, experienced constructivist, and constructivist inquiry were collapsed into three categories called supercodes. The supercodes were: 1) didactic and transitional teaching styles were combined as the teacher-centered supercode, and called didactic/transitional; 2) conceptual was maintained as the conceptual supercode; and 3) early constructivist, experienced constructivist, and constructivist inquiry were combined as the student-centered supercode. Similar classroom characteristics from the STAM instrument are also used in the TPPI Supercode Matrix to compare the participant's TPPI interview data with the information that emerged from that participant's STAM observation data.

The third level of analysis involved a narrative summary of the TPPI Supercode Matrix, which de-constructed the coding and described the interview data according to the various teaching styles on the continuum from didactic to constructivist inquiry. Each teacher participant's interview transcript was analyzed according to the coding maps,

then coded on the matrix, and summarized into three paragraphs. The first paragraph included information about teacher's actions in the classroom, the second paragraph included students' actions in the classroom, and the third paragraph consisted of the teacher participant's philosophy of teaching. The summary paragraphs also included information regarding the teaching styles according to the TPPI supercode matrix. Included in the summary paragraphs for each teacher participant is a tabular representation of the coded TPPI interview data.

TPPI Participant Summary

Julie (T1) expressed mostly a didactic/transitional style of teaching in the teacher actions portion of the interview; however, she also had some beliefs cross the early constructivist, and experienced constructivist areas in the teacher actions. Julie believed that the mandated curriculum was the starting point of deciding what to teach, reflecting didactic behaviors; however, using a transitional method of teaching, Julie described that she, as the teacher, determines what the students need to learn. She also believed that the classroom should be a place where students are enjoying what they are doing, which is transitional, and yet be actively engaged, on task, and focused on the activities, which is a feature of the early constructivist style. Julie explained that she moves to the next concept when most of the students understand the information, reflecting the experienced constructivist style, but she acted in a transitional manner when manipulating the learning environment. She explained that her main method of maximizing student understanding in the educational environment is through the use of various technology-related activities.

Julie's student actions varied across the didactic/transitional and early constructivist teaching styles in the TPPI interview. She believed that students learn best

in a variety of ways, reflecting several teaching styles: by doing (conceptual); by reading (transitional); by listening (didactic); through social interaction, including playing, singing, and role-playing (early constructivist). Julie also noted that all students learn differently, which also reflects the early constructivist teaching style.

Julie's philosophy of teaching was mainly conceptual. She believed that the most valuable learning her students will use outside of the classroom is the online environment for their future classes as well as a love of the content knowledge – the Spanish language. Julie also noted that she models the best teaching and learning situations by actively learning in front of her students. She explained that she learns her content and the technology along with her students, indicating a transitional style.

Robert (T2) articulated statements that were mainly didactic/transitional but also expressed some beliefs in the early constructivist/experienced constructivist areas for the teaching actions. He wants all of his students engaged in the lesson and interacting with him and with each other, reflecting the early constructivist/experienced constructivist styles. Conversely, in a more teacher-centered manner, Robert further described a well-organized classroom as one in which students use higher order thinking skills while critiquing and accessing the material. Robert explained that he teaches the content based on the school district curriculum and then individually, he decides what will help the students understand the material, which are features of the didactic/transitional teaching styles. Robert moves to the next concept in the curriculum based on student assessment outcomes and when he, as the teacher, feels that it is time to move on, both characteristics of the didactic style.

Robert's student actions were mainly early constructivist. Robert explained that he believes students learn differently and as the teacher, he attempts to "hit all modes of learning" in the classroom and tries to address different student needs. This is an early constructivist teaching style. Robert said he knows when students have learned through a variety of student assessments including those that are based on technology, tests, writing or group collaboration, which are a reflection of the didactic style. He also explained that he monitors learning through class discussions, which is early constructivist. Robert manipulates the educational environment both through the teacher's and the students' actions. He described how he stands in the front of the classroom in the "industrial…model" in the conceptual style as well as having students working together in groups, using technology, which also reflects the early constructivist teaching style.

Robert's philosophy of teaching is both didactic/transitional and conceptual in nature. He explained that he knows that he has learned through personal introspection and looking back at his past practice to look at the things he has done and the students have done; to see what has changed and what things have not changed. This is indicative of the didactic style. He believes that the most valuable learning for his students outside of the classroom includes the concepts being taught in his class as well as how to acquire knowledge and how to use technology meaningfully for the future. These are all areas of conceptual teaching. Robert explained that he models the best teaching/learning situation to his students through his actions by ensuring that he is as self-aware as possible for the situation – this is a feature of the transitional style of teaching.

Joseph (T3) expressed mainly didactic/transitional teaching statements. Joseph describes himself as a teacher-centered educator because he provides the information to

Table 8

TPPI Average Calculations – Julie (T1) Teacher and Student Actions

Category	*Question*	*A=1*	*B=2*	*C=3*	*D=4*	*E=5*	*F=6*	*Score*
Teacher Actions	Describe a well-organized classroom		☒		☒			6
	How do you decide what to teach and what not to teach?	☒	☒ ☒					5
	How do you decide when to move from one concept to another?					☒		5
	In what ways do you manipulate the educational environment to maximize student understanding?		☒					2
					Average TA Interview: 18/7			**2.5**
Student Actions	How do your students learn best?	☒	☒	☒	☒ ☒ ☒			18
	How do you know when learning has occurred in your classroom?				☒			4
	In what ways do you manipulate the educational environment to maximize student understanding?		☒					2
					Average SA Interview: 24/8			**3**

A=Didactic, 1; B=Transitional, 2; C=Conceptual, 3; D=Early Constructivist, 4; E=Experienced Constructivist, 5; F=Constructivist Inquiry

the students more than he facilitates the learning process. He went on to explain further that he likes the classroom to be conversational, but he expects the students' attention to be focused up front on the teacher. His classroom is designed with the desks in straight rows with the students facing the front of the classroom. Joseph teaches the content material based on what the local colleges expect so the students will succeed in that environment, which reflects the transitional teaching style. He believes in moving to the next concept, didactically, when it feels right to him, as the teacher; however, he also wants a certain amount of students to understand the concepts before moving on, a characteristic of the early constructivist style. Joseph knows when it is time to move on through the use of tests, discussions, and other evaluative tools. Joseph manipulates the educational environment through various activities in order to maximize or increase student learning. He described using technology-related activities, skits, hopscotch, and a clay brain project in his classes.

Joseph's student actions were predominantly early constructivist. Joseph believes that students have multiple ways of learning, which is a feature of the early constructivist teaching style. His descriptions of those learning styles reflect a variety of teaching styles: listening (didactic); reading (transitional); making projects (conceptual). He knows that students have learned when he receives their feedback individually and through class discussion. It is evident to him, as the teacher, that the students have learned since they are proud of their knowledge; these are all indicators of the early constructivist teaching style.

Table 9

TPPI Average Calculations – Robert (T2) Teacher and Student Actions

Category	*Question*	*A=1*	*B=2*	*C=3*	*D=4*	*E=5*	*F=6*	*Score*
Teacher Actions	Describe a well-organized classroom		☒		☒ ☒			10
	How do you decide what to teach and what not to teach?	☒	☒					3
	How do you decide when to move from one concept to another?	☒	☒					3
	In what ways do you manipulate the educational environment to maximize student understanding?			☒	☒ ☒			11
					Average TA Interview: 27/10			**2.7**
Student Actions	How do your students learn best?				☒			4
	How do you know when learning has occurred in your classroom?	☒			☒			5
	In what ways do you manipulate the educational environment to maximize student understanding?			☒	☒ ☒			11
					Average SA Interview: 20/6			**3.3**

A=Didactic, 1; B=Transitional, 2; C=Conceptual, 3; D=Early Constructivist, 4; E=Experienced Constructivist, 5; F=Constructivist Inquiry

Joseph's philosophy of teaching represented characteristics of both the didactic/transitional and the early constructivist/experienced constructivist teaching styles. Joseph noted that he knows he has learned not only when he can relay it someone else but also when he can process the information and then explain it to the students, which is reflective of both the early constructivist and experienced constructivist styles. According to Joseph, the most valuable learning for students outside of the classroom, conceptually, is the information they will use to raise their children as well as for their future careers. Joseph models the best teaching/learning situation for students by doing what "feels right." He explained that he would try something if he thinks it will help the students learn, a trait of the transitional teaching style.

Data Analysis

Research Question 1: What are the teachers' pedagogical characteristics in the secondary blended classroom setting when teaching in the face-to-face mode versus the online mode with the same group of students?

STAM Comparison Data

Data from the Secondary Teaching Analysis Matrix (STAM) observation instrument compared both teaching methods among the three teacher participants in the five categories: content, teacher actions, students' actions, resources, and environment. The simple numerical averages for each area were tabulated according to the STAM protocol and used for comparison purposes. Scores that fell between teaching styles were indicated with a slash between the numerical values. The didactic style was assigned the ordinal number 1; transitional was assigned 2; conceptual was assigned 3; constructivist

was assigned 4; experienced constructivist was assigned 5; and, constructivist inquiry was assigned 6.

The three teacher participants were selected to take part in the study since they were full-time educators in the high school and taught in the blended classroom environment. The three teachers had varied levels of experience in both the face-to-face and blended teaching modes as well as an assortment of teaching certifications and formal education degrees. The three teacher participants also received various levels of training related to online teaching methods provided through their school district. In some cases, the training involved 30 or more hours of professional development directly related to either online or blended teaching methods for the secondary classroom. Demographic data from the three participants along with the comparison data from the STAM teacher's action and students' actions areas from both the face-to-face and online teaching modes are represented in a tabular format in Tables 11 and 12.

The STAM observation data from both the face-to-face and online methods appears to indicate differences between the scores. The face-to-face scores are lower than the online scores. This indicates that the face-to-face scores are more teacher-centered or didactic/transitional compared to the online scores. The online scores are indicative of student-centered teaching or early/experienced constructivist based on the higher numbers.

The qualitative data gathered through the field notes on the STAM for the teacher participants enhances the quantitative data comparisons presented in Tables 11 and 12. Among the three teacher participants, the use of real-world examples from the face-to-face mode to the online mode became more student-centered when the use of technology

Table 10

TPPI Average Calculations – Joseph (T3) Teacher and Student Actions

Category	*Question*	*A=1*	*B=2*	*C=3*	*D=4*	*E=5*	*F=6*	*Score*
Teacher Actions	Describe a well-organized classroom		☒		☒ ☒			10
	How do you decide what to teach and what not to teach?		☒					2
	How do you decide when to move from one concept to another?	☒	☒			☒		8
	In what ways do you manipulate the educational environment to maximize student understanding?		☒					2
					Average TA Interview: 22/8			**2.7**
Student Actions	How do your students learn best?	☒	☒		☒			7
	How do you know when learning has occurred in your classroom?				☒ ☒ ☒			12
	In what ways do you manipulate the educational environment to maximize student understanding?		☒					2
					Average SA Interview: 21/7			**3**

A=Didactic, 1; B=Transitional, 2; C=Conceptual, 3; D=Early Constructivist, 4; E=Experienced Constructivist, 5; F=Constructivist Inquiry

was introduced into the classroom pedagogy. The teaching method also changed for the three teacher participants from one or two teacher-centered methods from the face-to-face mode to the online mode. The use of student-centered methods increased and included group work, discussions, and varied technology-based and project-based activities.

Hands-on activities and demonstrations either were rare or did not occur in the face-to-face mode for all participants, whereas in the online mode, they were the predominant method of instruction. When teaching in the online mode, teachers were student-focused using specific hands-on activities, although all three teacher participants developed the activities themselves. The level of teacher-to-student interaction increased from the face-to-face mode to the online mode for two of the three participants (T1 and T3). The field notes for participant T2 reflected scores that stayed the same in both teaching modes for the teacher-to-student interaction.

The types of teacher questions became more student-centered from the face-to-face mode to the online mode for two of the three participants (T1 and T3). Participant T2 did not ask any student questions when teaching in the online mode. Generally, the student assessments became more student-centered for all of the participants from the face-to-face to the online mode. Two of the three participants (T1 and T2) administered online quizzes or tests during the online teaching sessions. There were frequent checks for student knowledge and understanding; during the online teaching sessions, all of the participants used student feedback to adjust activities.

Table 11

Participant STAM Codes for Face-to-Face Mode

Teacher Number	Teacher Name*	Years of F2F Exp	STAM Content	STAM Teacher Action	STAM Student Action	STAM Resources	STAM Environment
T1	Julie	10	2/3	1/2	2/3	2/3	2/3
T2	Robert	14	3/4	2/3	2/3	1/2	2/3
T3	Joseph	7	2/3	2	2/3	3	2

Note: *Pseudonyms replace teacher participants' actual names. The number values with a slash mark signify that the participant's STAM score for that area wobbles within the range of the numbers indicated.

Students had more opportunities to express themselves in writing and other ways to represent their ideas in the online mode. When teaching in the face-to-face mode, students copied notes during the lectures, compared to the online teaching mode where students wrote essays, blogs, recorded podcasts, and performed other types of student-centered activities.

Student-to-student interaction also increased from the face-to-face teaching mode to the online teaching mode. For two of the three participants (T1 and T3), there was little to no student-to-student interaction when they taught in the face-to-face mode. In

Table 12

Participant STAM Codes for Online Mode

Teacher Number	Teacher Name*	Years of Blended Exp	STAM Content	STAM Teacher Action	STAM Student Action	STAM Resources	STAM Environment
T1	Julie	5	4	4	4	5	¾
T2	Robert	4	4/5	4	4/5	5	2/3
T3	Joseph	5	3/4	3/4	4/5	¾	3

Note: *Pseudonyms replace teacher participants' actual names. The number values with a slash mark signify that the participant's STAM score for that area wobbles within the range of the numbers indicated.

comparison, student-to-student interaction in the online mode was high since the students had to interact with each other in order to complete the tasks; they collaborated either in person or virtually.

The types of resources available became more student-centered for two of the three participants from the face-to-face to the online teaching method (T1 and T2). All of the participants used a Smart Board with audio when teaching using the face-to-face mode; however, they controlled the access to the resources. While the teacher used the online mode, students physically took control of not only the resources but also the classroom. In all three classrooms, students moved the furniture, chose where to sit, and selected which technology and print-based resources to use. Students also used and accessed what they needed to accomplish the task. The teacher took the supporting role when using the online teaching method and the students became self-reliant.

Research Question 2: To what extent, if any, do teachers' pedagogical beliefs influence teaching practices in the secondary blended classroom setting when teaching in the face-to-face mode versus the online mode with the same group of students?

TPPI Comparison Data

A simple numerical average was calculated from the TPPI data for the teacher's actions and student's actions. To calculate the simple numerical average, an ordinal number from one to six was assigned to each of the following styles: didactic was 1; transitional was 2; conceptual was 3; early constructivist was 4; experienced constructivist was 5; and constructivist inquiry was 6. An average was determined from the TPPI for each participant's teacher and student's actions. The term, "wobble," indicated a score between the ordinal values (Brown, 2002). A number between 1 and 2

was reported as 1/2; a number between 2 and 3 was reported as 2/3, and a number between 3 and 4 was reported as 3/4. Value 1/2 meant a teacher participant's score wobbling between the didactic and transitional style; the value 2/3 signified the teacher participant's score wobbling between transitional and conceptual; the value 3/4 signified the teacher participant's score wobbling between conceptual and early constructivist; while, the value 4/5 indicated the teacher participant's score wobbling between the early constructivist and experienced constructivist. By using TPPI data from Tables 8-10, a numerical average for teacher's actions (TA) and student's actions (SA) was determined. Each participant's TPPI averaged value for TA and SA is provided in Table 13.

The score range for the TPPI interview data in the teacher actions area for all three participants indicates similar pedagogical beliefs (Table 13). The value 2/3 signifies scores wobbling between the transitional/conceptual teaching styles. The scores listed in the students' actions area for each teacher participant each increased in number and consequently, became more student-centered.

STAM & TPPI Comparison Data for the Teacher Participants

The data from the Teachers Pedagogical Philosophy Interview (TPPI) and the Secondary Teaching Analysis Matrix (STAM) were used to compare the areas of teacher action and student action. As shown in Table 1, seven STAM subcategories (5-11) code teacher's actions and five STAM subcategories (12-16) code the students' actions in the classroom settings. Seven of the thirteen TPPI questions generated teacher actions (TA) and student actions (SA) outcomes. The TPPI and STAM instruments code for teachers' and students' actions using a continuum of teaching styles from the didactic to

constructivist inquiry. Averages from the TPPI and STAM instruments were calculated to compare the data gathered from the teacher participants.

Table 13

Teacher Participant TPPI Codes

Teacher Number	*Teacher Name**	*TPPI Teacher's Actions*	*TPPI Students' Actions*
T1	Julie	2/3	3
T2	Robert	2/3	3/4
T3	Joseph	2/3	3

Note: *Pseudonyms replace teacher participants' actual names. The number values with a slash mark signify that the participant's STAM score for that area wobbles within the range of the numbers indicated.

The comparison of the TPPI and STAM data analysis answers the second research question: To what extent, if any, do teachers' pedagogical beliefs influence teaching practices in the secondary blended classroom setting when teaching in the face-to-face mode versus the online mode with the same group of students? Figures 1 and 2 illustrate the teacher participants' TPPI and STAM data when using both the face-to-face and online teaching methods.

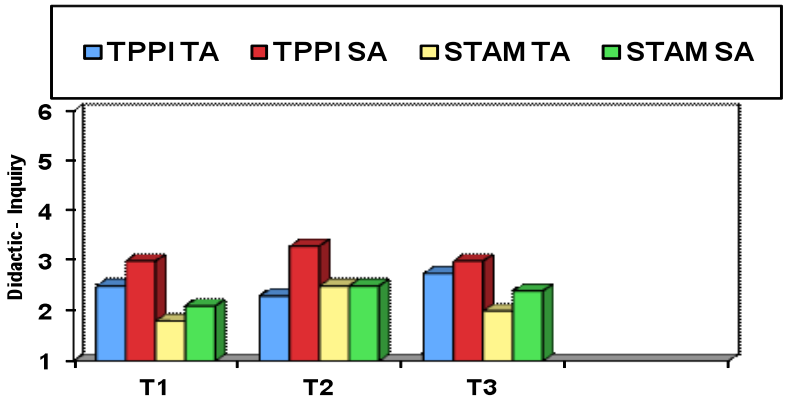

Figure 1. Comparisons of the face-to-face STAM and TPPI data collected from teacher participants.

According to the TPPI and STAM comparison data using the face-to-face teaching methods (Figure 1), two of the three teacher participants (T1 and T3) perceived themselves as more student-centered in the teacher action areas than the researcher observed. Robert (T2) had a slightly more teacher-centered view of himself as a teacher than was observed and analyzed by the researcher in the blended classroom during the face-to-face teaching delivery mode. Regarding the student action areas, all of the teacher participants had a more student-centered view of themselves as teachers in the face-to-face mode compared to the observations made during this teaching mode.

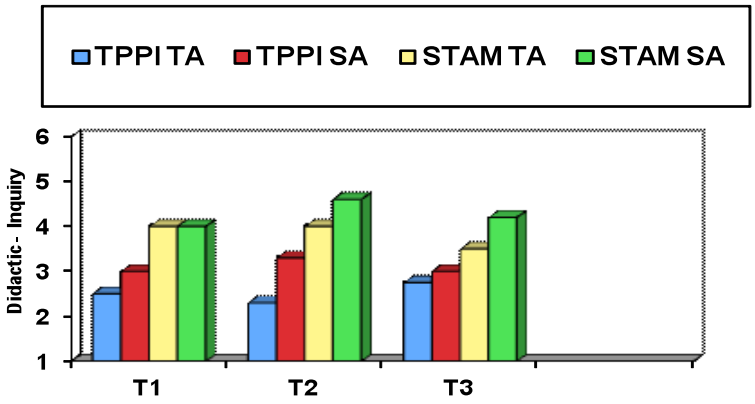

Figure 2. Comparisons of the online STAM and TPPI data collected from teacher participants.

The TPPI and STAM comparison data using the online teaching methods (Figure 2) illustrates that all of the teacher participants had a more teacher-centered view of themselves compared to the observations in blended classroom during the online teaching delivery mode. This occurred in both the teacher action and student action areas.

The TPPI interview data resulted in reported teaching styles for both the teacher action and student action areas for each participant just as the STAM observation data reported teaching styles for each participant for each distinctive teaching method. The TPPI data results for Julie (T1) showed teaching styles wobbling between transitional and conceptual. The STAM observation data from the face-to-face mode showed teaching styles of didactic and transitional, which is more teacher-centered. Julie's STAM observation data from the online mode signified a teaching style of early constructivist, which is more student-centered than her interview data.

The TPPI interview data for Robert (T2) showed teaching styles that wobbled between transitional/conceptual in the teacher action areas and teacher styles that wobbled between conceptual/early constructivist in the student action areas. Robert's STAM observation data from the face-to-face mode showed teaching styles that wobbled between transitional/conceptual in both the teacher action and student action areas. The observation data using the face-to-face teaching mode was more teacher-centered compared to his self-reported interview data. Robert's STAM observation using the online mode showed a teaching style of early constructivist in the teacher action areas and teacher styles that wobbled between early constructivist/experienced constructivist in the student action areas, which were more student-centered than his interview data.

The TPPI interview data for Joseph (T3) showed teaching styles that wobbled between transitional/conceptual in the teacher action areas and a teacher style of conceptual in the student action areas. Joseph's STAM observation data using the face-to-face mode showed a teaching style of transitional in the teacher action areas and teacher styles that wobbled between transitional/conceptual in the student action areas. The observation data using the face-to-face teaching mode was slightly more teacher-centered compared to Joseph's self-reported interview data. Joseph's STAM observation data using the online mode showed teaching styles that wobbled between conceptual/early constructivist in the teacher action areas and teacher styles that wobbled between early constructivist/experienced constructivist in the student action areas, which were more student-centered than his interview data.

All three participants exhibited a similar pattern of scores between the TPPI and STAM data in both the face-to-face and online teaching modes. The self-reported

pedagogical beliefs and classroom practices represented teaching styles, which were more student-centered using the face-to-face mode but more teacher-centered in the online mode. Compared to the TPPI scores, the scores on the STAM observation rubric were more student-centered for each participant who taught using the online delivery method; therefore, the online STAM scores were higher for each participant compared to their interview data.

Confidence Interval

Confidence intervals were calculated for the means of the STAM scores for the participants using the face-to-face and the online teaching methods. The confidence intervals were used to determine with 95% probability the range of values within which the true population values fall for each teaching method. In order to calculate the confidence intervals, the standard deviations of the means were calculated. The standard deviation is the measure of variability of the mean. In Table 14, the STAM mean scores for the face-to-face teaching method are lower than the STAM mean scores for the online teaching method. The mean scores correspond to the ordinal numbers assigned to the teaching styles on the STAM observation rubric; the lower the score, the more teacher-centered the delivery mode.

Small standard deviations, meaning those closer to zero, indicate that the data are close to the mean scores (Field, 2005). The standard deviation for the face-to-face mean score is .08 and the standard deviation for the online mean score is .28; both calculations indicate data points close to the mean, illustrating a precise representation of the data.

The confidence interval for the face-to-face scores and the confidence interval for the online scores do not overlap, indicating that there is a difference between these two

methods. The confidence interval for the face-to-face mode is 2.15 to 2.55, whereas the confidence interval for the online mode is 3.22 to 4.63. Because the sample size for the study was small, the confidence interval for each teaching method is wider than may be expected from a larger sample.

Table 14

Summary Statistics for Face-to-Face and Online Teaching Modes

Variable	*N*	*Mean*	*Standard Deviation*	*95% CI for Mean*
Face-to-Face Score	3	2.35	0.08	(2.15, 2.55)
Online Score	3	3.92	0.28	(3.22, 4.63)

Chapter Summary

The data analysis revealed patterns and trends among the teacher participants who taught using two distinctive teaching methods. Two out of the three teachers (T2 and T3) interviewed described themselves as "teacher-centered" and their Teachers Pedagogical Philosophy Interview (TPPI) interview data resulted in transitional/conceptual and/or the conceptual teaching styles. The third teacher participant (T1) described herself as "student-centered," although both her TPPI data and her face-to-face Secondary Teaching Analysis Matrix (STAM) data reflected "teacher-centered" pedagogy.

The STAM observation data did not always reflect the teachers' pedagogical beliefs. In the face-to-face mode, the teachers' pedagogical beliefs were aligned more closely with their teaching pedagogy than in the online teaching mode. The teachers'

pedagogical styles in the online mode were more student-centered than their TPPI data results. The course documents from the participants' classroom sessions provided supplemental information and data related to the teaching styles from both the face-to-face and online teaching methods. The documents, which included lesson plans and student assessments, reflected the teaching styles observed in the respective modes.

Confidence intervals were calculated for the means of the STAM scores for each teaching method. The confidence intervals were used to determine with 95% probability the range of values for the true population. The confidence intervals for the scores do not overlap, indicating that there was a difference between the face-to-face mode and the online mode. The values in the face-to-face mode were lower than those in the online mode, signifying that that the face-to-face teaching method is a more teacher-centered environment. Chapter five addresses and discusses the findings, the implications of the study, as well as recommendations for further research.

CHAPTER 5

CONCLUSIONS, SUMMARY & RECOMMENDATIONS

Summary

This study described the pedagogical characteristics of the secondary blended classroom when teachers used the face-to-face teaching method and the online teaching method with the same group of students. Furthermore, the study examined teachers' pedagogical beliefs and the influence they had, if any, on the teachers' classroom practices.

Data were gathered from three sources including classroom observations, teacher interviews, and a review of lesson plans and student assignments and assessments. Three teachers were purposively selected based on their instructional status in a high school providing full time blended learning to their full time district students. The students were indirectly observed as part of the instructional process in the classroom.

It is important to note that the researcher began the participant selection process to include only teachers who taught in separate face-to-face and online classroom settings with the same student learning outcomes. However, due to encountering various barriers to the selection process, including participant lack of interest and low number of student enrollments in the online courses, it was deemed necessary to include teacher participants who instruct in the blended learning format in the sample population. Since blended learning environments utilize both the face-to-face as well as the online teaching methods in the secondary school environment, it was determined that these teacher participants met the criteria of the study. These difficulties contributed to the smaller population sample found in this study.

Discussion of Findings

Pedagogical Characteristics

This study focused on classroom pedagogy, specifically didactic teaching methods and constructivist teaching methods using classroom observations of the teacher participants. The Secondary Teacher Analysis Matrix (STAM) was the observation measurement tool used to describe and score the teachers' pedagogical teaching styles. The review of the lesson plans, student assignments and student assessments for the teacher participants reflected the pedagogical teaching styles for each teacher participant.

When comparing the pedagogical characteristics in the face-to-face mode and the online mode, the results were very dichotomous. Meaning, all of the teacher participants displayed teacher-centered pedagogical characteristics in the face-to-face teaching mode in the blended classroom setting, regardless of content area, earned certification, education level, or experience level. The pedagogical characteristics were based on five categories including content, teacher actions, student actions, resources, and environment. Conversely, in the online mode, all of the teacher participants displayed student-centered pedagogical characteristics in all five categories.

When the researcher observed the teachers in the face-to-face teaching mode, in two out of the three instances, the desks were aligned in rows, the students listened passively to lecture-based lessons and the teacher was physically in the front of the room. Although the desks in the other classroom were not arranged in rows but in various groupings, the teaching style remained the same. Student actions in the face-to-face mode tended to involve mainly note-taking during the lecture or working on worksheets during guided practice. Student questions were usually procedural rather than conceptual.

Teacher questions in this teaching mode for all participants tended to focus on correct answers only rather than allowing students to independently process the information. The resources used during the face-to-face mode were teacher-controlled in all classrooms and in most cases, the students were passive recipients of the resources and/or technology used in the classroom.

Unlike the face-to-face mode, the online teaching mode was student-dominated. The students, in every classroom, re-arranged the desks and other furniture to accommodate their learning needs; students also accessed the various technology and other resources they needed to accomplish their tasks. They were more self-reliant and they asked the teacher for guidance in a supporting role for resources and technology. Student-to-student interaction also increased in the online mode. The content that was delivered in the online mode to the students was done via podcast and video streaming; and, the teachers in all cases physically moved themselves into the classrooms rather than staying at the physical front of the classroom.

Although the study results clearly delineated teacher-centered teaching styles in the face-to-face mode and the student-centered teaching styles in the online mode, the research states that there should be a balance between the two teaching styles regardless of educational context and teachers should have the ability to transfer their pedagogy from one setting to another (Moss, 2005). Pedagogical practices for instructional design should not be viewed as either teacher-centered or student-centered. To simplify the classroom setting to a dichotomous learning environment and ignore how various teaching methods can be effectively utilized together diminishes the teacher's role (Moss, 2005). The dynamic context of a classroom allows teachers to choose the appropriate

instructional activities for the learning outcomes based on student learning needs rather than on the location of the instruction or on the medium of the delivery.

Other research has questioned whether teachers have the ability to transfer student-centered constructivist pedagogy from the online setting to the face-to-face setting (Lowes, 2010). Lowes' (2010) study described the teacher participants as "migrants" as they traveled between the face-to-face classroom and the online classroom setting. Her study suggested that teachers do transfer practices from the online to the face-to-face setting but in subtle ways. However, it is important to note that Lowes' study had strong connotations that teachers should adopt constructivist pedagogical strategies from the online environment and re-design their face-to-face classes using only these strategies.

Conflicting research suggested that teachers using online methods not only learn new pedagogical techniques but they also learn new roles compared to those used in the face-to-face learning environment (Spector & de la Teja, 2001; Berge, 1995; Scagnoli, Buki, & Johnson, 2009). However, Scagnoli et al. (2009) concluded in their study that teachers' knowledge of online pedagogy and technology skills do not translate to the transfer of this knowledge to the face-to-face environment. There were several other factors contributing to the lack of pedagogical transference from the online to the face-to-face setting. They included the individuals' teaching style and preference, the teacher's perception of online and face-to-face teaching and learning, the teachers' technical proficiency in online software applications, the teachers' previous experience and training using pedagogical practices similar to those used in the online environment, and the teachers' perceived classroom constraints including time and work assignments.

The three teacher participants in this research study who taught in the secondary blended classroom had a variety of years of teaching experience in both the face-to-face and online teaching methods as well as a multitude of teaching certifications. The participants indicated that in order for them to access the online technology, namely the Smart Boards, the laptop cart, online materials and any auxiliary technology including audio equipment, they attended a district mandated 30-hour professional development training course and in one participant's case, attended university–level coursework for online and blended learning. The school district required the teachers to participate in the professional development course prior to the installation and implementation of the technology in their classrooms. The course included not only technology training but also professional development for online and blended learning pedagogical practices.

This research study's results regarding the teachers' pedagogical characteristics in the distinctive teaching modes did not support the Lowes' (2010) hypothesis that teachers' online pedagogical techniques are transferable to the face-to-face setting. Rather, the STAM results showing the bifurcated teaching styles in the face-to-face mode versus the online mode strengthened the conclusions from the Scagnoli et al. (2009) study that stated teachers' online pedagogical knowledge and skills do not automatically transfer to the face-to-face context. Furthermore, it is imperative to reiterate Moss's (2005) theory, which states that there should not be a dichotomy of either/or regarding teacher-centered teaching methods and student-centered teaching methods when discussing distinctive learning contexts. Rather, the teaching methods should be balanced and selected based on the students' learning needs instead of on the location of the learning or the medium of the learning.

Teacher Beliefs and Classroom Practices

This study also examined the teacher participants' pedagogical beliefs and their possible influence on classroom practices. The Teacher Pedagogical Philosophy Interview (TPPI) instrument was used as the measurement tool to determine each teacher participant's pedagogical style based on their beliefs. The TPPI data were scored in the two categories of teacher actions and student actions. The scores indicated a similar range for all of the teacher participants (see Table 13). In the teacher actions category, all of the teacher participants scored in the 2/3 range, which signifies a score wobbling between the transitional and conceptual teaching styles. These are considered to be in the teacher-centered range of the teaching styles on the continuum between didactic and conceptual. The scores calculated for the student actions category for all of the teacher participants increased in number to the 3 or 3/4 range, which signified scores in the conceptual to the early constructivist teaching styles. These scores in the student actions area showed an increase in number, which moved toward student-centered teaching beliefs on the continuum in this category.

The teachers' pedagogical beliefs were then compared to their pedagogical characteristics from both the face-to-face mode and the online mode in the blended learning classroom observations. The participants displayed inconsistencies between their pedagogical beliefs and their classroom pedagogical practices in both the face-to-face and the online teaching modes in the blended classroom. In the face-to-face mode, for T1 and T3, the self-reported pedagogical beliefs recorded through the interviews, were more student-centered in the teacher actions compared to the classroom practices recorded through the observations. For participant T2, the self-reported pedagogical beliefs, were

more teacher-centered in the teacher actions compared to the classroom practices recorded through the observations. All participants indicated more student-centered pedagogical beliefs in the student actions compared to the observed pedagogical practices in the face-to-face classroom. Regarding the online mode, the observed classroom practices were more student-centered compared to all of the teacher participants' self-reported pedagogical beliefs as indicated through their interviews.

Two of the three teacher participants described themselves as more teacher-centered teachers during the interviews. The way in which they answered some of the other questions in the interview, however, did not always align with teacher-centered methods or philosophy. For example, Robert (T2) explained that he monitors student learning through class discussions and that as a teacher, he attempts to "hit all modes of learning" in the classroom since all students learn differently; these descriptions are student-centered teaching styles. In the same regard, Joseph (T3) described himself as providing information to students more than facilitating the learning process. However, he continued to explain that, although he moves to the next concept when it feels right to him, as the teacher, he also manipulates the learning environment in various ways to increase student learning. These descriptions are also student-centered teaching styles.

When observing Robert and Joseph in the face-to-face teaching mode, they both used the Smart Board as a tool for projecting notes and video for students to passively receive. In one instance in Joseph's classroom, students used the Smart Board for a brief student presentation. General student questions to the teacher are conceptual, however there are no student-to-student interactions occurring in the face-to-face mode in either teacher's classroom. In the online mode, both teacher participants used various classroom

resources, including laptops and mobile learning devices for problem-based activities, group assignments, and student-accessed online resources. Student-to-student interactions were omnipresent and necessary to the online teaching mode in both classrooms.

Only one teacher participant described herself as student-centered. The other questions she answered during the interview, however, crossed several belief areas of the teacher-centered and student-centered philosophies. In one instance she described that she, as the teacher, determines what the students need to learn, whereas in another section of the interview, she explained that she moves to the next concept when students understand the information.

When observing this participant in the face-to-face teaching mode, the teacher led the class in reading questions from a worksheet and answering correct answers with set limitations and exceptions. The students were passive recipients of the classroom resources in the face-to-face mode. For example, they listened to language exercises as a whole group and wrote their responses on a worksheet. There was no student-to-student interaction during the face-to-face mode in this classroom and the student questions were mainly procedural. When observing this teacher in the online mode, however, students worked together in both physical and online collaborative groups. The teacher became a facilitator as students accessed the resources they needed to complete the assignments. Student-to-student interaction was a necessity as they completed the group assignments and problem-based activities in this teaching mode. Student questions were less procedural and more concept-based as they worked on higher-level thinking activities in the online mode.

This study's results regarding the discrepancy between the participants' pedagogical beliefs and their classroom practices are consistent with the results reported by Kynigos and Argyris (2004). Their study focused on teachers' pedagogical beliefs and classroom practices, which emerged while using a new computer-based math course. The researchers concluded that although the beliefs and practices were inconsistent, there were contextual factors in the school and classroom environment that contributed to the discrepancies.

The two main contextual school factors noted in the Kynigos and Argyris (2004) study included the school mandated curriculum and national (Greek) educational standards that dominated the teachers' lessons and activities regardless of their individual pedagogical beliefs. The researchers delineated specific teachers' pedagogical beliefs regarding mathematics and presented evidence that they all designed similar lessons and projects based on teaching style. Furthermore, the researchers argued that the school culture also incorporated certain aspects of student-centered learning based on scheduling mandates. During one particular hour every week, students were required to work collaboratively to explore a certain topic. Both students and teachers came to expect the type of teaching and learning that occurred during this time period due to this "enculturation" of teaching and learning styles.

Other researchers have also found that teachers' pedagogical beliefs and their practices are inconsistent due to contextual factors within the classroom (Duffy and Anderson, 1984; Ajzen, 2002). Although teachers communicate their beliefs regarding teaching practices, the complexities of the classroom shape their daily instructional decisions. Teachers will determine how they implement lessons including which topics to

teach, which assessments to use, and which projects to assign based on classroom management, student learning and emotional needs, classroom resources, time available, and course content.

Implications of the Study

This study's results indicate that the three teacher participants may have gained technological pedagogical content knowledge, abbreviated as TPACK, as they completed the professional development requirements associated with the online and blended learning pedagogy. TPACK has been defined as the intersection of teachers' knowledge of their content area, general pedagogy and the appropriate integration of educational technology. It is not simply adding a technology component within the classroom; it is the pedagogical knowledge and instructional skill of using technology within a specific content area to increase student learning (Koehler and Mishra, 2005), .

The teachers displayed TPACK knowledge through the use of problem-based activities, collaborative online group assignments, as well as accessing online course content during the online mode. The teachers used learning goals as the focus of their online activities rather than using the technology as the focus of their project goals. Each subject area was unique with each teacher using varying projects in different ways to accommodate the course content and the student learning needs in the classrooms. However, it appeared through the study's results that the constructivist pedagogy utilized through the TPACK was not transferred from the online teaching mode to the face-to-face teaching mode. There are several implications that can be postulated from this information.

Lack Knowledge to Transfer Pedagogy

The first implication is that teachers may not know how to transfer the pedagogical techniques from one mode to another. It has been shown that teachers acquire new skills and take on new roles when they teach in new contexts, namely the online learning environment. It is still not clear whether teachers are able to transfer the pedagogical knowledge and skills back to another learning context. Since the teachers performed skills which showed evidence of aligning to TPACK, it appears that they should have the ability to do the same in the face-to-face mode. The issue remains in transferring the TPACK skills and knowledge from the online mode to the face-to-face mode.

Not all of the three teacher participants from the blended study agreed that the professional development program provided by the school district correlated positively with more student-centered teaching in the online mode; however, they could not explain why. One of the participants (T3) thought it did not encourage a change in teaching methodology and believed that through personal "trial and error," he made meaningful changes in the classroom. Another participant (T2) shared that the mandatory professional development course was not very beneficial since he felt he "developed well beyond what was covered in the trainings." The last participant (T1) felt that the professional development course was an important part of her overall experience as a teacher along with her master's degree training and her classroom experience as a teacher.

This researcher believes that the professional development program influenced the online pedagogy to some extent in each of these observed classrooms. It is possible

that other factors have occurred to enhance the teachers' pedagogical strategies; however, they all had the same 30-hour foundational training in online pedagogy provided by the school district. Furthermore, the participants may believe that if it is professional development, then it must be substandard - being hindered with the proverbial educational myth of professional development, even when it is a positive experience.

Some research has presumed that if teachers instruct successfully in the online classroom setting, they will automatically transfer specific student-centered teaching styles to the face-to-face classroom setting (Lowes, 2010). Other in-depth research revealed that although some skills may transfer, they are dependent on many variables (Scagnoli et al. 2009). The transfer is more likely to happen when teachers have had a pleasant experience in the online environment, and when the content is similar between online and face-to-face courses. The study further stated, however, that the teachers' technology proficiency and knowledge of distance education theory are not sufficient for the transfer of online pedagogy to the face-to-face learning environment.

Contextual School Factors

Another implication identified in this study is the potential influences of the school context. Ernest (1989) suggested that the powerful social context of the school environment was one reason why teachers' beliefs did not correspond with their practices. According to Ernest (1989), the socialization of the context was so powerful that that even though teachers may have differing sets of beliefs regarding pedagogy, teachers in the same school adopted similar classroom practices. Therefore, viewing teachers' beliefs separately from the larger context is "ill advised and probably unproductive" (Pajares, 1992, p.326).

This researcher believes that there may be potential contextual school factors contributing to the differences between the pedagogy observed in the face-to-face mode and the online mode in this study. First, the teacher participants were involved in the mandated blended learning professional development program and/or the university-level coursework, which provided not only technical training but also online pedagogical instruction. This may have affected their planning and implementation of the coursework in the online environment. The district's expectation of utilizing specific online pedagogy may be established through the professional development curriculum.

The expectations of others may also influence the teachers' classroom practices. Expectations fall within the social context of the school and include what students, parents, other teachers, and administrators believe should be occurring in the classroom context. The administrators' expectations for teachers to use the mandated curriculum and state standards was verified when the researcher analyzed the lesson plans and interview transcripts. The teachers each had their own method of lesson planning but explained that their main method of constructing course planning always began with the district's mandated curriculum, which is linked with the state academic standards. These two school contextual factors are those also found in the Kynigos and Arygyris (2004) study.

Regardless of the teachers' individual pedagogical beliefs and learning goals, it appeared that the teaching and learning activities in the online mode were analogous to each other. It was also clear that the teachers observed in this study did not plan their lessons together nor did they have other commonalities among each other beyond their school setting and their professional development requirements.

It is important to recognize that there is extant research that has reported that teachers' beliefs should not be studied outside the context and culture of their environment (Fang, 1996). In fact, contextual factors may assist in shaping certain educational beliefs and Pajares (1992) suggests that to study pedagogical beliefs and social context separately is not beneficial.

Other external "stressors" defined by other researchers that may affect teachers' classroom pedagogical practices include excess workload, time restrictions, student behavior, lack of available resources, peer relationships and the physical difficulties of teaching (Borg, 2001). A study of time restrictions and its relationship to teacher instruction reported that teachers tend to lecture and stress rote memorization as the main teaching style (Blasé, 1986). This study further concluded that time is a larger contextual factor on pedagogy than student discipline, student absences, student apathy, large class sizes, and inappropriate scheduling.

One of the teacher participants involved in this study of blended learning, shared that if he had "unlimited [classroom] time and a liberally designed curriculum," he would have the ability to use more pedagogical strategies than he currently does. He further stated that he would use more student-centered strategies if these two critical factors were not as restricted in the school environment.

Maxion (1996) argued that when contextual factors balance teachers' pedagogical beliefs, classroom practices and teacher beliefs are consistent; however, when the school contextual factors conflict with the teachers' pedagogical beliefs, the classroom practices and the teachers' beliefs are inconsistent. This researcher believes that there are several school contextual factors influencing the teachers' pedagogical practices in the

classroom. The factors are both positive and negative, however, due to the discrepancies between the teachers' pedagogical beliefs and their classroom practices, there are conflicts between the contextual factors and the teachers' educational beliefs. The contextual factors in this study may include: the administration's expectation of online pedagogy and TPACK with the online teaching mode in the blended classrooms; the use of district mandated curriculum and state standards when planning and implementing lessons and activities; the high school block schedule; and, the expectations of the student population, including learning and emotional needs.

Medium Used to Deliver Course Content

Another implication in this study may be the medium teachers used to deliver the lesson content affected the teaching style. Since laptops and mobile learning devices were used during the online mode and not used during the face-to-face mode, they may have affected the teaching styles. Although the teachers all used Smart Boards and other technology in the face-to-face mode, these educational technology components were used in a passive manner with the students. Meaning, students were not the active users of the technology, rather they were the recipients of the information.

The teaching style changed in the online mode. Students took an active role and became users of the technology during the activities, rather than watchers of the technology. In the online mode, students manipulated software, recorded themselves and others, watched tutorials, repeated podcast lectures, read scripts of the podcast lectures, made their own presentations, blogged about their assignments to each other and the teacher, and researched solutions to the problems.

In the face-to-face mode, teachers used technology to present material to the whole group. The teachers used video, audio, pictures, and power point presentations in the face-to-face mode. Only the teacher accessed and controlled the technology. If students missed the video or audio, they only had one opportunity to see or hear it due to the whole group instruction, regardless of content area. Students were not actively engaged with this medium in this mode. This researcher does not believe that the medium is the cause of this; it is due to the planning practices and implementation practices of the teacher.

Technology advocates have proposed that in order to actively engage students in the learning process and increase their learning retention, use of technology in the classroom can achieve this goal (Kim & Bonk, 2006). This researcher believes that regardless of technology or other teaching media, effective teaching pedagogy and effective lesson planning are based on student needs and curricular goals; the technology or lack thereof did not effect the pedagogical style. Only one of the teacher participants from the blended learning study believed that the technology was the tool that created effective teaching practice. Furthermore, they believed that they had the same instructional delivery regardless of the mode, with the technology enhancing their teaching abilities. The other participants stated that the online mode can make it easier to develop constructivist lessons, however it depends on the content and the assignments.

Teachers' Lack of Content Knowledge

An implication of the study based on the results may be related to a study by Borg (2001), which stated that teachers who have strong content and subject matter knowledge also have the ability to choose appropriate instructional tasks. Furthermore, teachers who

are confident in their content knowledge have a broad scope of teaching strategies to correspond with the various learning styles of the students. Conversely, teachers who are less sure of their content matter use more direct teacher-centered teaching methods to convey the material. In this way, teachers tend to avoid student questions and cover the material quicker (Shulman, 1987).

This researcher does not believe that the teachers observed in the face-to-face mode were less sure of their content matter. Based on the study data and analysis, they were prepared, confident in their delivery, and asked the students questions. The observation data, lesson plans, and interviews suggest that the teachers were well-versed in their subject matter. Although they utilized more teacher-centered teaching methods in this mode, they still provided the content material using knowledge and application beyond simple recall and they interacted with the students in a variety of ways. Their actual performance in the classroom, however, was more didactic than constructivist in this mode.

Espoused Beliefs vs. Beliefs-in-Use

Based on the study's data, it is a possibility that the teacher participants shared their espoused beliefs in the interviews while the researcher observed their true pedagogical beliefs during their classroom performances in both teaching modes. Teachers espouse what they think they believe or what they assume is true about teaching and learning. Their true pedagogical beliefs only manifest when they are practicing in the classroom (Argyris & Schon, 1974).

This theory of espoused beliefs and theory-in-use may explain why there are conflicts between the interview results of the teachers' self-reported beliefs and the

observed pedagogical classroom practices. Depending on how the teachers responded to the questions in the interview, they may have intentionally or unintentionally provided their "espoused" beliefs rather than their true beliefs.

The teacher participants in this study all had varying definitions of teacher-centered versus student-centered classrooms. This is a critical component to the study since it can change not only the teachers' pedagogical beliefs but also their classroom practices. One of the teacher participants explained that teacher-centered classrooms are "old-fashioned and …much like a high school of the 80s;" whereas, he described student-centered classrooms as teacher-facilitated with students working on their own on projects. Another participant explained that the main difference between teacher-centered and student-centered classrooms is in the depth of student learning.

As Moss (2005) theorized, the "best practice" debate between teacher-centered versus student-centered practices has directed some educators to discard pedagogical approaches that may be appropriate in certain situations. Determining the usage of both approaches should be dependent on the students' learning needs and the course outcomes, not on educational trends (Moss, 2005).

Teachers' Preference to Pedagogical Style

Another possible implication to the study's results is the teachers' personal preference and emotional ties to a particular teaching style, regardless of their formal teacher training and knowledge. Teachers' pedagogical beliefs have a strong affective component compared to their pedagogical knowledge (Nespor, 1987). The research suggests that teachers instruct courses based on significance they place on the content and the lesson activities. Nespor (1987) described an individual's emotional experience and

its result on her later classroom practices. Ms. Skylark experienced a traumatic event as a student; due to this occurrence, she attempted to create the type of learning environment she had visualized as a child. Because her dream or visualization of the perfect classroom was inconsistent with effective classroom practices, she regularly had unfinished lessons and frequent interruptions. Although Ms. Skylark had appropriate formal teacher training and pedagogical knowledge, her strong emotional pedagogical beliefs affected her classroom practices.

Nespor (1987) further explained that a "crucial experience or some particularly influential teacher produces a richly-detailed episodic memory which later serves the student as an inspiration and a template for his or her own teaching practices" (p.320). Memories can be derived from former teachers, literature, and the media.

Calderhead and Robson (1991) reported from their study of preservice teachers that their distinctive memories of the classroom from their experiences as students, may influence their classroom practices and play a role in how they interpret their training and pedagogical knowledge.

This researcher believes that the teacher participants in this study may have demonstrated pedagogical styles in the face-to-face mode based on their personal preferences. These preferences originate with the teachers' pedagogical beliefs. Since beliefs are thought to have emotional characteristics, it is an implication that can have far-reaching effects on classroom practices regardless of teacher preparation programs. It may require performance-based professional development training to change teachers pedagogical beliefs to ultimately change their beliefs and balance classroom practices.

Implications for Practice

Professional development programming related to pedagogy practiced in both the online and face-to-face modes must be explored based on the results of this study. As the results showed, the participants' pedagogy in the online mode was much more student-centered compared to their pedagogical beliefs. It is a possibility that the professional development they received regarding instruction related to online pedagogy ultimately affected their observed classroom pedagogy. If this is a valid observation, quality focused professional development programs could affect pedagogy in various teaching contexts.

It is important to design professional development programs including pedagogy related to the online mode or classroom setting and the face-to-face mode or classroom setting. As the research indicated, professional development programs should include ways in which the teachers can make their beliefs explicit, challenge their beliefs, and assimilate new beliefs into their classroom pedagogy (Nespor, 1987).

The other implication for practice involves teacher preparation programs, since the research indicates that teachers' pedagogical beliefs may originate in their experiences as a student. Since these emotionally connected experiences and memories can affect their teaching practices in later years, addressing the pedagogical belief systems of preservice teachers along with pedagogical knowledge may assist in creating consistency between pedagogical beliefs and practices.

Recommendations for Further Research

Further research related to pedagogical practices in the K-12 blended learning environment need to continue. The lack of extant studies in this area is persistent. The first recommendation for further research in this area is a replication of this study using

the Salish I Research instruments in both the face-to-face and online classroom environments. Since this is the first study to utilize these instruments in the blended classroom setting with both the face-to-face and online teaching modes, a replication should be completed for validation purposes.

A second recommendation for further research involves teachers' pedagogical beliefs and their association with their classroom practices. Due to the conflicting results in the literature, continued research must be completed to determine if teacher beliefs are an indicator of their behaviors. Since there are such unique characteristics of both learning contexts in both the face-to-face and online classrooms, teacher beliefs must be studied much more in depth to determine what influence they may have on the classroom context.

A third recommendation is to study which contextual factors influence teachers' pedagogical beliefs; and, secondly, to what extent the contextual factors influence their classroom practices. Due to the degree of inconsistency between the teachers' pedagogical beliefs and their classroom practices found in the extant research, it is important to determine where the belief structures stem from. Most of the research indicates that educational beliefs are not context-free (Fang, 1996; Pajares, 1992), therefore, it is essential to determine the contextual factors that have influenced particular beliefs.

Another area for research is to determine how online teaching knowledge and experience influence face-to-face classroom teaching practice at the secondary level. There is a large gap in the literature in this area, especially at the secondary level, in

which no studies have examined teachers' online pedagogy and its impact on their current or future face-to-face pedagogical practices.

A fifth recommendation for further research is to study student engagement and its relation to the online teaching method versus the face-to-face teaching method. It is important to determine students' level of engagement and their levels of learning retention dependent on the mode of teaching as well as the type of teaching style used with the level of engagement and retention.

A sixth area for further research is to examine students' perspective on their interest, learning needs, and/or their satisfaction regarding the online versus the face-to-face teaching mode in a blended learning classroom. Since this study focused on the teachers' pedagogical practices in both learning environments and their pedagogical beliefs and the influence they had on the learning environment, there was no potential to determine the students' needs or satisfaction with either of the teaching modes.

A seventh recommendation for further research is to study professional development courses and their applicability to pedagogy in both the online and face-to-face teaching modes. The study should examine the teachers' technological pedagogical content knowledge and determine its influence on the teachers' pedagogical beliefs and their classroom practices.

A final recommendation for further research is to study student achievement levels and their possible relationship to the teaching methods employed in the blended learning classroom. A variety of student achievement outcomes should be utilized along with in-depth interviews of the subjects to determine the meaning of the data. Student

achievement outcomes should include not only test scores but also student attendance, discipline records, and assignment grades from both learning contexts.

Conclusions

The significant increase in K-12 online learning opportunities in the last decade has shown a parallel growth in K-12 online enrollments (Picciano and Seaman, 2009). Due to this rapid growth in such a unique format of learning in the K-12 educational setting, the need to determine not only the appropriate pedagogical techniques for the online and blended contexts is critical but also the teachers' pedagogical beliefs and their classroom practices.

Four broad implications have emerged from this study. Contextual school factors may influence teachers' classroom practices, teachers' personal preferences related to teaching style may affect their pedagogy, teachers may have the inability to transfer pedagogical knowledge and skill from one instructional environment to another, and teachers may espouse one set of beliefs while practicing another.

The social, cultural, and emotional aspects of the instructional process should be included in the research context, especially when studying the complex factors of teacher beliefs and their teaching styles. If we are to expect to make improvements to the instructional process in both the face-to-face and online teaching modes, teachers, students and administrators should be involved in the various levels of planning and support needed for classroom change.

Although the findings of this study indicated that the pedagogy in the face-to-face mode and online mode were dichotomous, the research postulates that there should be a balance created between teacher-centered and student-centered teaching styles regardless

of the educational context. Separating teaching methods into two distinct categories oversimplifies the complex and dynamic classroom environment. Effective teaching is not a matter of having to choose between dichotomous teaching strategies, but instead it is knowing how to balance the teaching strategies to achieve learning.

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Appendix A

Sample Consent Letters

SUPERINTENDENT – PERMISSION TO CONDUCT RESEARCH

Dear Superintendent:

This letter is being written to request your permission for me to conduct research at your institution.

I am conducting a research study entitled, " A Descriptive Study of Pedagogical Characteristics in Online and Face-to-Face Secondary Classrooms." The purpose of the study is to describe the pedagogical characteristics of online and face-to-face secondary classrooms in a blended learning environment. Your school will be the only school participating in the study pending your approval. The study is being conducted with secondary level faculty who teach face-to-face and online classes in the blended learning environment at the high school. Students will also be indirectly observed as part of the instructional process.

This study is being done in partial fulfillment of a doctoral degree in Administration and Leadership offered by Indiana University of Pennsylvania in collaboration with East Stroudsburg University. By granting me permission to observe and interview the secondary level teachers selected in the purposive sampling process, you will be contributing to the body of knowledge of K-12 online pedagogy. The findings of this study may be instrumental in determining effective teaching strategies in multiple learning contexts. Your agreement to permit your teachers and students to participate in the study is voluntary.

There is no compensation for your institution's participation in the study.

The researcher will be working with the Online Director and the secondary-level teachers of three face-to-face classes and three online classes in the high school. The researcher will indicate to the teachers, parents, and students that their participation is voluntary. The Online Director has agreed to work with the researcher in identifying the potential teacher participants and scheduling the day, time, and location for the classroom observations.

The classroom observations will occur within a one-week time frame. The observations will occur for two sessions per course in both the face-to-face and online educational settings. Each observation session will be approximately 60 minutes in length; for a total of 120 minutes per teacher or two class sessions.

The interview sessions will last approximately 45 minutes each. The interviews will be conducted on the telephone and will be audio-taped and transcribed using an Internet service. The teachers will be provided a toll-free telephone number to call at a prescribed date and time in order for the recording and transcription service to commence. The teachers' willingness to be interviewed is strictly voluntary.

Any information collected in relationship to this study will be kept confidential. The research records will be kept private and will be stored in a locked filing cabinet in the researcher's office. Only the researcher will have access to the research records.

In order for me to move forward in this process, the East Stroudsburg University IRB is requesting receipt of a signed consent form on your institution's letterhead. The original letter should be sent to: Kerri Ruck, 1198 Chipperfield Drive, Stroudsburg, PA, 18360.

My ability to conduct and complete this study is dependent on the cooperation of individuals such as you. I want to thank you in advance for your sincere consideration of my request.

Sincerely,

Kerri Ann Ruck

INFORMED CONSENT - TEACHER
For a Research Study entitled
"A Descriptive Study of Pedagogical Characteristics in Online and Face-to-Face Secondary Classrooms"

You are invited to participate in a research study being conducted by Kerri Ruck, a doctoral student in the Administration and Leadership program offered by Indiana University of Pennsylvania in collaboration with East Stroudsburg University. The intent of the study is to describe the pedagogical characteristics of online and face-to-face secondary classrooms that share identical student learning outcomes. You were selected as a possible participant because you are a teacher in the East Stroudsburg High School and/or the East Stroudsburg Virtual Academy located in East Stroudsburg, Pennsylvania.

If you decide to participate in this research study, you will be observed in either the face-to-face or the online classroom environment, you will participate in an interview, and you will provide classroom documents or artifacts. The classroom observations will occur within a one-week time frame. The observations will occur for two sessions per course in both the face-to-face and online educational settings. Each observation session will be approximately 60 minutes in length; for a total of 120 minutes per teacher or two class sessions.

The interview session will last approximately 45 minutes. The interviews will be conducted on the telephone and will be audio-taped and transcribed using an Internet service. You will be provided a toll-free telephone number to call at a prescribed date and time in order for the recording and transcription service to commence. At a later date you will be given an opportunity to review the transcript record for accuracy.

During the interview session, you will be asked questions about your pedagogical philosophy or beliefs. I do not anticipate the risks associated with answering the questions to be greater than any risks you encounter on a day-to-day basis. Your participation will be instrumental in determining effective teaching strategies in multiple learning contexts and add to the literature of K-12 online pedagogy.

There is no compensation for your participation in the study.

Any information you provide as part of your participation in this study will be kept confidential. The research records will be kept private and will be stored in a locked cabinet in the researcher's office. Only the researcher will have access to the research records.

Your participation in this study is completely voluntary. Your decision as to whether or not you participate will not affect your future relations with your school, principal, or students. If you decide to participate, you are free to withdraw at any time.

This project has been approved by the East Stroudsburg University of Pennsylvania Institutional Review Board for the Protection of Human Subjects. If you have any questions about the study, please ask them now or contact Kerri Ruck by phone 484-866-5279 or by e-mail at kar9538@live.esu.edu. You may also contact her faculty advisor, Dr. Lare by e-mail at dlare@po-box.esu.edu. If you have any questions or concerns regarding your rights as a participant in this study, you may contact the East Stroudsburg University Institutional Review Board (IRB) by phone 570-422-3336 or e-mail at sdavis@esu.edu.

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER OR NOT YOU WISH TO PARTICIPATE IN THIS RESEARCH STUDY. YOUR SIGNATURE INDICATES YOUR WILLINGNESS TO PARTICIPATE.

Participant Signature _____Date _____

Participant Name (printed) _____

Principal Investigator Signature _____ Date_____

Principal Investigator Name (printed) _____

INFORMED CONSENT - STUDENT
For a Research Study entitled
"A Descriptive Study of Pedagogical Characteristics in Online and Face-to-Face Secondary Classrooms"

You are invited to participate in a research study being conducted by Kerri Ruck, a doctoral student in the Administration and Leadership program offered by Indiana University of Pennsylvania in collaboration with East Stroudsburg University. The intent of the study is to describe the pedagogical characteristics of online and face-to-face secondary classrooms that share identical student learning outcomes. One of your classes was selected as a possible study location in the East Stroudsburg High School and/or the East Stroudsburg Virtual Academy located in East Stroudsburg, Pennsylvania.

If you decide to participate in this research study, you will be observed in either the face-to-face or the online classroom environment. The classroom observations will occur within a one-week time frame. The observations will occur for two sessions per course in both the face-to-face and online educational settings. Each observation session will be approximately 60 minutes in length; for a total of 120 minutes or two class sessions.

I do not anticipate any risks associated with being observed in either classroom environment. Your participation will assist in determining effective teaching strategies in multiple learning contexts and add to the literature of K-12 online pedagogy.

There is no compensation for your participation in the study.

Any student information recorded as part of the classroom observations will be anonymous. At no time will student names or student sub populations be recorded as part of the research study. The research records will be private and will be stored in a locked cabinet in the researcher's office. Only the researcher will have access to the research records.

Your participation in this study is voluntary. Your decision as to whether or not you will participate will not affect your future relations with your school, teacher, or fellow classmates. If you decide to participate, you are free to withdraw at any time.

This project has been approved by the East Stroudsburg University of Pennsylvania Institutional Review Board for the Protection of Human Subjects. If you have any questions about the study, please ask them now or contact Kerri Ruck by phone 484-866-5279 or by e-mail at kar9538@live.esu.edu. You may also contact her faculty advisor, Dr. Lare by e-mail at dlare@po-box.esu.edu. If you have any questions or concerns regarding your rights as a participant in this study, you may contact the East Stroudsburg University Institutional Review Board (IRB) by phone 570-422-3336 or e-mail at sdavis@esu.edu.

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER OR NOT YOU WISH TO PARTICIPATE IN THIS RESEARCH STUDY. YOUR SIGNATURE INDICATES YOUR WILLINGNESS TO PARTICIPATE.

Participant Signature _____Date _____

Participant Name (printed) _____

Principal Investigator Signature _____ Date_____

Principal Investigator Name (printed) _____

INFORMED CONSENT - PARENT
For a Research Study entitled
"A Descriptive Study of Pedagogical Characteristics in Online and Face-to-Face Secondary Classrooms"

Your child is invited to participate in a research study being conducted by Kerri Ruck, a doctoral student in the Administration and Leadership program offered by Indiana University of Pennsylvania in collaboration with East Stroudsburg University. The intent of the study is to describe the pedagogical characteristics of online and face-to-face secondary classrooms that share identical student learning outcomes. One of your child's classes was selected as a possible study location in the East Stroudsburg High School and/or the East Stroudsburg Virtual Academy located in East Stroudsburg, Pennsylvania.

If you decide to allow your child to participate in this research study, they will be observed in either the face-to-face or the online classroom environment. The classroom observations will occur within a one-week time frame. The observations will occur for two sessions per course in both the face-to-face and online educational settings. Each observation session will be approximately 60 minutes in length; for a total of 120 minutes or two class sessions.

I do not anticipate any risks associated with being observed in either classroom environment. Your child's participation will assist in determining effective teaching strategies in multiple learning contexts and add to the literature of K-12 online pedagogy.

There is no compensation for your child's participation in the study.

Any student information recorded as part of the classroom observations will be anonymous. At no time will student names or student sub populations be recorded as part of the research study. The research records will be private and will be stored in a locked cabinet in the researcher's office. Only the researcher will have access to the research records.

Your child's participation in this study is voluntary. Your decision as to whether or not you will allow your child to participate will not affect their future relations with their school, teacher, or fellow classmates. If you decide to allow your child to participate, your child is also free to withdraw at any time.

This project has been approved by the East Stroudsburg University of Pennsylvania Institutional Review Board for the Protection of Human Subjects. If you have any questions about the study, please ask them now or contact Kerri Ruck by phone 484-866-5279 or by e-mail at kar9538@live.esu.edu. You may also contact her faculty advisor, Dr. Lare by e-mail at dlare@po-box.esu.edu. If you have any questions or concerns regarding your child's rights as a participant in this study, you may contact the East Stroudsburg University Institutional Review Board (IRB) by phone 570-422-3336 or e-mail at sdavis@esu.edu.

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER OR NOT YOU WISH TO HAVE YOUR CHILD PARTICIPATE IN THIS RESEARCH STUDY. YOUR SIGNATURE INDICATES YOUR WILLINGNESS TO HAVE YOUR CHILD PARTICIPATE.

Participant Signature (Parent) _____Date _____

Participant Name (Parent) (printed) _____

Principal Investigator Signature _____ Date_____

Principal Investigator Name (printed) _____

Appendix B

TPPI Questions and Coding Scheme

Selected Questions from Salish I Research Project Teachers' Pedagogical Philosophy Interview

The following protocol will be used for the teacher interview:

Date:
Time:
Place:
Interviewer:

The following statement will be read to each interviewee:

This interview is being conducted for the purpose of research. Information obtained during this interview will be analyzed and included in the findings of this study. Do you consent to the recording of this interview?

Please state your name and position. I will ask you a series of questions. Please feel free to make additional comments if you feel they will enhance the answers to the questions. Do you have any questions before we begin?

Interview Questions:

1. How would you describe yourself as a classroom teacher?
3. Describe a well organized classroom. When you have your classroom running the way you want it, what is it like? (TA)
4. How did you form this model of the well-organized classroom?
8. How do you know when you have learned? (PT)
11.How do you decide what to teach and what not to teach? (TA)
12. How do you decide when to move from one concept to another? (TA)
13. What learning in your classroom do you think will be valuable to your students outside the classroom environment? (PT)
15. In what way do you try to model that best teaching/learning situation in your classroom? (PT)
19. How do you believe your students learn best? (SA & PT)
21. How do you know when student learning is occurring or has occurred in your classroom? (SA)
22. In what ways do you manipulate the educational environment to maximize student understanding? (SA)
25. What values do you want to develop in your students?
46. How do you define technology?

Thank you for your participation. Do you have any questions or comments before the taping ends?

Questions developed by Lon Richardson and Patricia Simmons (1994)

CODING SCHEME FOR TPPI

Format of the Coding Scheme

The following information provides an a priori coding scheme for categorizing data from TPPI interview transcripts produced for each year of data collected[11] . A teacher is the unit of analysis for this coding scheme. The codes emerged as a product of iterative discussions among Salish team members as they analyzed many interviews over two years. Three levels of analysis were built into the final scheme to code answers to the questions from the TPPI.

Level One Analysis

The first level of analysis is presented in the form of maps. Each TPPI question has a map of its own. Each statement on a map is a category for data extracted from an interview transcript. Each category has a code number and letter near it (see Figure 1).

Figure 1

A sample TPPI coding map

Level Two Analysis

The second level of analysis of the TPPI coding scheme is in the form of a matrix. The matrix for the second level of analysis shows which codes from the first level of analysis fit into which \ columns and rows on the matrix (see Figure 2). The categories (codes) from the first level of analysis were collapsed into categories called super codes and placed on the matrix. A super code is a row by columm code. It consists of a column heading indicating teacher style combined with a row heading labeling an aspect of what is happening in the classroom. The parameters for each super code category in the second level of analysis are the categories of the STAM. The categories

[11] (This coding scheme does not address question 5, or questions 45 and higher on either form of the TPPT. These items were not part of the final analysis for Salish I.

used as labels for columns are didactic, transitional, conceptual, early constructivist, experienced constructivist, and inquiry.

Figure 2

Excerpt from TPPI supercode scheme

	Teacher Styles Level 1 categories TEACHER CENTERED		CONCEPTUAL	STUDENT CENTERED		
Aspects of Classroom	Level 2 STAM categories DIDACTIC	TRANSITIONAL	CONCEPTUAL	EARLY CONSTRUCTIVIS	EXPERIENCE CONST.	INQUIRY
	Supercodes					
TEACHER/ CONTENT	TCDIDA	TCTRAN	TCCONC	TCEARL	TCEXPE	
	Level 1 TPPI codes					
	12a-d,g,i-m			12e,f,h,n-q		
	14a, b, h-j,o,p	14c-f, k-m				

The categories used as labels for rows represent what is going on in the classroom. Some Some categories were added beyond those of the STAM The labels are "teacher/content, self as teacher, student actions, environment, context, diversity, philosophy of teaching." The latter labels are called "aspects" herein. Each row heading actually contains several horizontal "rows". The boundary for each label is designated by darkened lines above and below the label. A teacher's style for a particular aspect is determined by combining the various TPPI response codes in each column between the dark horizontal lines for each aspect. The distribution of the codes across the columns determines the teacher's style for an aspect.

This first set of super codes enables the researcher to relate the self report data in categories that emerged from the TPPI interviews to categories in video taped classroom observation data analyzed with the STAM instrument. There were TPPI questions that corresponded to all the aspects. However, codes were not developed to correspond to all of the teacher styles in STAM.

Level Three Analysis

The third level of analysis of the TPPI coding scheme is also in the form of a matrix. The categories from the second level of analysis were collapsed into another set of super code categories. Didactic and transitional codes were combined in the teacher centered column, conceptual codes were placed in conceptual column, and early constructivist, experienced constructivist, and inquiry super codes from level two were combined into the student centered column for level three.

Getting Oriented to the Coding Scheme

Step 1. Read responses to a specific question on several transcripts to get an idea of the types of statements respondents made to that question.

Step 2. Read the descriptors of each category on the map that matches the question you just read. Determine your interpretation of the category (thus the interpretation of the code).

Coding an Interview Transcript

Level One Coding

Read the answer to the question in one transcript. Highlight text that appears to be relevant to one or more of the categories on the maps. Place the information into categories from the related map. Record the code numbers and letters of the category, or categories, related to a highlighted segment in the margin of the transcript. Where you have more than one code for a block of text, be sure to make it clear with lines or arrows which word or phrase stimulated you to place a particular code in that margin.

(Why would you highlight more than just the specific word, phrase, or sentence that fits into a category? The reason one may be highlighting more than just a phrase or a sentence in a specific paragraph is to preserve the context from which you are inferring a particular meaning and assigning the code. This is important when several people are coding the same material, because it helps researchers compare the types of statements they each used to assign data to a category (code) and reach consensus on codes. When highlighted/coded information gets separated from the original transcript, as it does when one uses a computer program to assist in coding and analysis, it makes the documentation for your interpretations and quotations visible.

Level Two Coding

Make a copy of the entire super code matrix for level two analysis found in this section of the instrument package for each teacher in your sample. Review one teacher's transcript at a time. Copy the code in the margin next to the highlighted portion of the text into the matching cell in the matrix. Proceed one question at a time.

When you have completed the matrix for a teacher, translate the codes in the cells into written paragraphs. This paragraph will reflect the distribution of the codes across columns. Construct each paragraph using the language describing the categories for level one the codes used earlier. In essence, you are decoding the matrix for a reader. Construct one paragraph for each aspect measured by the TPPI (e.g., teacher/content, self as teacher, student actions, etc.). One paragraph should describe the data across rows thus describing one aspect. Consider the distribution of codes across columns and choose from the following labels "didactic, transitional, conceptual, early constructivist, experience construtivist, and inquiry". There may be an array of responses in which case select the various labels that describe the data for each. Repeat this process for each set of TPPI super codes related to each aspect. Three examples of "paragraphs" appear at the end of this description of the TPPI coding scheme.

The extent to which teachers' responses on their TPPI's correspond with the TPPI codes that are identified in the column below each super code, you would decide which super code(s) describes the teacher in regard to that aspect. For example, codes of 12a, 14a, 15c, and 35a would receive the super code TCDIDA which indicates this teacher's responses related to teacher/content on the TPPI could be labeled didactic in a level two analysis.

A teacher's results may fall into more than one column indicating that the teacher's style varies. This makes it difficult to assign as single label and a researcher must make judgement calls based on self determined weighting of responses, being aware that the existance of the variety may have significant meaning.

Coding Level Three

For level 3 analysis, review each teacher's completed level two matrix in your sample, one at a time. Attend to the columns and heading created by the degrees of gray shading on the matrix. Write one paragraph for each aspect measured by the TPPI. Select from the labels "teacher centered, conceptual, and student centered" to orient each paragraph describing the teacher's self perception of what he/she thinks and does. Include data from the row for one aspect. For teacher centered, include all the cells shaded in medium gray. For conceptual, use the cells in the middle column of the matrix that are slightly shaded. For student centered, use all the cells shaded in the darker gray. These paragraphs will be entered into another matrix, the "Teacher Data Matrix", when data from various instruments are triangulated later in the study.

Next Step
In order to discuss a specific group of teachers related to a single aspect measured by the TPPI, or related to a specific program feature, a next step might be to lay one matrix over the other to summarize the number of teachers who answered a particular question in a particular way. Also, these paragraphs will become part of the Teacher Data Matrix that is used for comparing data about a teacher across several teacher data measures (instructions for creating this matrix are at the end of this teacher maesures section).

Examples of ways to write the paragraphs for level two describing aspects of the TPPI
(Summary of TPPI)

Method 1

Teacher Actions
IUP109 exhibits actions across DIDACTIC, TRANSITIONAL and CONCEPTUAL styles of teaching. This teacher indicated class size and time as the CLASSROOM CONSTRAINTS which indicate DIDACTIC in nature. However, this teacher's handling of these CONSTRAINTS suggests that this teacher tends to be CONCEPTUAL in nature. She indicated that she overcomes the constraints by ALTERING her INSTRUCTION.

IUP109 makes DECISIONS about curriculum in a DIDACTIC fashion by following mandated CURRICULUM. This teacher's CLASSROOM ORGANIZATION skills tends to indicate her nature to be both DIDACTIC and TRANSITIONAL. She believed that an organized classroom should not be messy or dangerous to the kids, which reflects her DIDACTIC NATURE. On the other hand, TRANSITIONAL nature reflects through her description of the organized classroom in terms of planning.

IUP109 moves to the NEXT CONCEPT when students do well on the tests which reflects TRANSITIONAL styles of teaching. The teacher acts in a TRANSITIONAL method when it comes to manipulating EDUCATIONAL
ENVIRONMENT to maximize students understanding. She executes TRANSITIONAL methods by doing a variety of classroom activities such as taking kids outside.

Appendix C

STAM Standard Operating Procedures

Secondary Science Teaching Analysis Matrix
J. Gallagher & J. Parker
May 1995 Revised August 1995

CONTENT

A Didactic	B Transitional	C Conceptual	D Early Constructivist	E Experienced Constr.	F Constructivist Inquiry
1. Factual content, *factoid.*	• Content tends to be *descriptive* with concepts and factoids given equal emphasis.	• Content tends to be *explanatory* with conceptual content organized around key ideas.	• Teacher and students negotiate understanding of *key ideas* with teacher's content emphasized.	• Teacher and students negotiate understanding of *key ideas* based in students' ideas & content.	• *Investigations* dominate content. Conceptual content and connections embedded into design, implementation, analysis, and report of investigation.
2. No examples or interconnections to: a) real world events b) related ideas c) key ides of the subject	• Real world examples and/or related ideas separate from other places of content.	• Examples and connections made by teacher to: a) real world events b) related ideas c) key ideas of the subject	• Teacher leads students in using examples and constructing connections to: a) real world events b) related ideas c) key ideas of concept	• Connections constructed by students with teacher's guidance to: a) real world b) related ideas c) key ideas of concept	• Connections constructed by students are related to investigation, data analysis, and concept building.
3. Over simplified so that the limits or exceptions within content are not presented. Many statements are absolutes without qualifiers.	• Some limits, exceptions, and alternate interpretations included, but are not integrated with other content.	• Limits, exceptions, and alternate interpretations are presented as part of the content.	• Teacher leads students to identify limits and exceptions that may generate alternate ways of representing or interpreting observations and events.	• Teacher and students *identify* limits and exceptions that my generate alternate ways of representing or interpreting observations and events.	• Teacher and students identify limits, exceptions, and alternate interpretations by applying knowledge to part of problem solving.
4. No explicit mention of how we know. Scientific method is presented separately as role procedure.	• No explicit mention of how we know. Processes of science (observation, inference, experiment, etc.) are not integrated with content.	• "How we know" included in content. Together integrated processes of science with concepts.	• Teacher Leads students to reconstruct how evidence has been used to formulate scientific ideas and to use scientific processes to formulate and evaluate ideas.	• Students, with teacher's guidance, reconstruct how evidence has been used to formulate scientific ideas and to use scientific processes to formulate and evaluate ideas.	• Processes of science applied to design of project investigation, data collection, data analysis, and conceptual building.

Secondary Science Teaching Analysis Matrix
J. Gallagher & J. Parker
May 1995 Revised August 1995

TEACHER'S ACTIONS AND ASSESSMENT

	A Didactic	B Transitional	C Conceptual	D Early Constructivist	E Experienced Constr.	F Constructivist Inquiry
5)	1 or 2 teaching teacher-centered methods predominate	• 3 or 4 teacher-centered teaching methods, including some hands-on.	• Rich repertoire of teacher-centered teaching methods, including hands-on.	• Some use of student-centered methods such as group work, student writing, discussion, and concept mapping.	• Extensive use of student-centered methods.	• Project method with teacher and students selecting methods of inquiry and analysis, guided by questions being investigated.
6)	Demonstrations, labs, and hands-on activities are rare.	• Some demonstrations, labs, or hands-on activities which are either overly directed (cookbook) or undirected (e.g. exploration without follow up).	• Many demonstrations, labs, or hands-on activities that are conceptually focused. "Answers" generally known ahead of time.	• Investigations, demonstrations, and hands-on activities lead by teacher and incorporate some students' ideas.	• Investigations, demonstrations, and hands-on activities are constructed by teacher and students and build on students' ideas.	• Demonstrations and hands-on activities are part of longer term investigations. Students have a high degree of input in generating question and planning investigation.
7)	Little teacher-student interaction about subject matter (chalk and talk).	• Teacher-student interaction about correctness of students' ideas about unconnected facts.	• Teacher-student interaction about correctness of students' knowledge of conceptual content.	• Teacher-student interaction about clarification and usefulness of students' ideas and understanding is teacher-directed.	• Students & teacher have input into the clarification and usefulness of students' ideas and understandings.	• Teacher-student interaction focused on investigations with topics and goals of inquiries often determined by students.
8)	Teacher's questions call for factual recall.	• Teacher's questions directed towards scientific ideas, not towards connections or applications. They do not build on students' responses.	• Teacher's questions are directed towards knowledge of scientific concepts and their connections and applications. They do not build on students' responses.	• Teacher's questions are goal-oriented and occasionally emerge from students' responses. They are used to clarify students' ideas.	• Teacher's questions are goal-oriented and frequently emerge from students' responses. They are used to clarify students' ideas.	• Teacher's questions are goal oriented, emerge from students responses, and are used to guide investigations.
9)	Tests and quizzes only	Occasional checking, in addition to tests & quizzes, of students' knowledge.	• Frequent checking, in addition to tests & quizzes, of students' knowledge.	• Multiple forms. Some assess students' knowledge. Some assess students' understanding.	• Multiple forms. Most assess students' understanding.	• Multiple forms arising from investigations and presentations.
10)	None	• Checking students' knowledge.	• Checking students' knowledge and preplanning.	• To guide teacher in adjusting activities.	• To guide teacher and students in adjusting and carrying out activities.	• To guide teacher and students in making adjustments in investigations and analysis.
11)	Teacher disregards students ideas about subject matter.	• Teacher may accept all students' ideas. Teacher views students' unscientific ideas as oddities.	• Teacher investigates students' ideas about subject matter and works to alter "unscientific" ideas.	• Teacher occasionally seeks students' ideas and considers them in instructional decision making this information some of the time in designing activities.	• Teacher actively seeks student's ideas. Assessment drives instructional decision making.	• Treats students as self-directed learners and interacts as co-investigator.

Secondary Science Teaching Analysis Matrix
J. Gallagher & J. Parker
May 1995 Revised August 1995

STUDENTS' ACTIONS

A Didactic	B Transitional	C Conceptual	D Early Constructivist	E Experienced Constr.	F Constructivist inquiry
12) Writing and other representations of ideas not used. Short answers predominate.	• Writing and other representations of ideas rarely used. Most are reconfigurations of information provided.	• Several forms of writing and other representation of ideas are used. Most are reconfigurations of information provided.	• Students occasionally use writing and other representations of ideas as part of developing their understanding and constructing meaning. Much is reconfiguring information provided.	• Students frequently use writing and other representations of ideas as part of developing their understanding and constructing meaning.	• Students choose from a variety of forms of writing and other representations of ideas as part of developing their understanding and constructing meaning.
13) Few student questions.	• Student questions clarifying procedures dominate. Some questions ask clarification of terminology or repeat of information.	• Student questions focus on clarification of meaning related to specific concepts or procedure.	• Some student questions focus on clarification of meaning related to specific concepts. Some address key ideas, their connections and applications. Few are procedural.	• Student questions address key ideas, their connections and applications.	• Student questions address key ideas, their connections and applications in the context of a long-range, investigative framework.
14) Student-student interaction is rare.	• Some student-student interaction, mostly about procedure.	• Some student-student interaction about procedure. Some about articulating scientific ideas correctly.	• Some student-student interaction directed toward understanding and applying scientific ideas. Some about procedure.	• Student-student interaction directed toward understanding and applying scientific ideas. Students are self-reliant.	• Student-student interaction is frequent and is directed toward understanding and planning. Students are very self-reliant
15) Students rarely volunteer examples or analysis.	• Students volunteer a few examples, but connections to class activities may be weak.	• Students volunteer some examples related to class activities.	• Students volunteer analysis as well as examples. Some are related to class activities. Others are weakly related.	• Students volunteer analysis as well as examples. Most are pertinent to class activities.	• Students volunteer analysis and examples that are used in setting the direction of the class.
16) Students are passive or ignore teacher's procedures.	• Students show confusion over procedures.	• Students accept procedures and role.	• Students demonstrate some frustrations with role. For example, "Why doesn't the teacher just tell me the answer?"	• Students do some negotiating with teacher of procedures and role.	• Students help define their role in the investigation.

Secondary Science Teaching Analysis Matrix
J. Gallagher & J. Parker
May 1995 Revised August 1995

RESOURCES

A Didactic	B Transitional	C Conceptual	D Early Constructivist	E Experienced Constr.	F Constructivist inquiry
17) Little beyond single text or format.	• Text and small number of other resources, including some hands-on.	• Multiple resources, i.e. visual aids, videos, manipulatives, laboratory materials, technology, or people.	• Multiple resource i.e. visual aids, videos, manipulatives, laboratory materials, technology, or people.	• Multiple resources i.e. visual aids, videos, manipulatives, laboratory materials, technology, or people.	• Multiple resources i.e. visual aids, videos, manipulatives, laboratory materials, technology, or people.
18) Students look at, but do not actively use resources. Resources may not be related to content.	• Resources are not related to content.	• Resources are related to content and illustrate ideas.	• Some resources are used to aid students' understanding and application of ideas.	• Many resources are used to aid students' understanding and application of ideas.	• Resources are integrated into and arise from investigation.
19) Access to resources controlled by teacher.	• Access to resources controlled by teacher.	• Access to resources controlled by teacher, but there is some discussion of access with students.	• Access to resources is guided by teacher with some discussion of access with students.	• Access to resources is based on teacher/student negotiation.	• Access to resources is guided by the investigation question.

ENVIRONMENT

A Didactic	B Transitional	C Conceptual	D Early Constructivist	E Experienced Constr.	F Constructivist Inquiry
20) Teacher-dominated.	• Teacher-controlled. Little sharing of decision making with students.	• Teacher-controlled. Some sharing of decision making with students about use of time.	• Students & teacher make some joint decisions about time and activities.	• Students & teacher make many joint decisions about time and activities.	• Students & teacher make joint decisions about nature of and procedures for investigation.
21) Few teaching aids displayed. May not be integrated with content.	• Some teaching aids displayed. May not be related to content.	• Many teaching aids displayed related to content.	• Many teaching aids displayed related to content.	• Many teaching aids displayed related to content. Some are made by students.	• Many teaching aids displayed derived from investigation.
22) Few examples of students' work displayed.	• Students' work displayed is typically similar for all students (i.e. worksheets or identical models).	• Some variation in students' work displayed.	• Students' work displayed, includes some student creations (i.e. original posters, stories, or demos).	• Students' work displayed, includes many student creations (i. e. original posters, stories, or demos).	• Students' work displayed, includes student creations derived from investigation.

Secondary Science Teacher Analysis Matrix ©
J. Gallagher and J. Parker

Revised, August 1995
Michigan State University

Directions for Salish Project Use

ANALYSIS OF TEACHERS' JOURNALS

Analyze the Teacher's Journal first. Code each group of responses that pertain to one concept on a SSTAM Analysis Record. Enter a "J" in a particular color ink to distinguish this from video analysis. Do not forget the back of the form.

ANALYSIS OF VIDEOS

While reviewing a teacher's video tapes, you will complete three records:

- Record of Activities
- SSTAM Analysis Record - found inside of this folder
- Summary

Record of Activities

The Record of Activities is a catalogue of the classroom activities and transitions seen in the video. It should include the tape number, the date the tape was made, A or T designating activity or transition, the beginning time of the activity or transition, and a brief description of each activity or transition. A sample entry follows.

Date	Tape #	A or T	Start time	Description
2/8/95	1	A1	0:00	T explaining "Create a Baby" act.
		T1	0:13	Transition to groups
		A2	0:16	Group work creating baby's genes

This signifies that this first tape was made on 2/8/95 and the major activities were the teacher explaining to the class how they will "Create a Baby" which starts at the beginning of the class and group work following it in which students created a fictitious baby's genetic make-up.

The Record of Activities will be used in two ways: (1) as a reference for the SSTAM Analysis Record and (2) as a reference for further analysis of the videos. For the example given above, the Activity 2 could be cited as 1.A2 on the SSTAM Analysis Sheet. That would mean Tape 1, Activity A2.

SSTAM Analysis Record

We suggest that analysis be done by two, or even three people watching the tape together, especially as you learn to use this Matrix. Become familiar with the full matrix first. If an entry on the Analysis record seems unclear, refer to the full matrix. You may wish to make notes on the Analysis Record as you watch the tape.

- Use one SSTAM Analysis Record for the three tapes. Use a different color for each class session.
- After you have watched an entire class session, stop the tape. Code each activity and transition on the SSTAM Analysis Record as completely as possible. To designate an impression that comes from the entire class session instead of from a particular activity, use 1X, 2X, etc. where the number identifies the class session.

Summary

The summary consists of six paragraphs: an initial paragraph describing the teacher's overall teaching style with whatever qualifiers seem necessary; one paragraph for each of the five areas in the matrix. These five paragraphs should include at least one sentence for each of the 22 dimension of the matrix. At the end of each sentence enter the three cell designations that best describe what you saw on each of the three tapes. Example: 14. Student-student interaction dealt with procedures and correctness of homework answers. D1: 14BC, D2: 14C, D3: 14B

STAM Analysis Record – Mathematics Version

Secondary Teacher Analysis Matrix – Mathematics Version
J. Gallagher & J. Parker
May, 1995 Revised October, 1995

	TEACHING STYLE	A. DIDACTIC	B. TRANSITION	C. CONCEPTUAL
Content	*1. Structure of content*	factoids	descriptive	explanatory
	2. Examples & Connections	non	not integrated	made by T
	3. Limits, exceptions, & multiple interpretations	not present	some included not integrated	part of content
	4. Processes & history of mathematics	static/algorithmic approach	some connections, not integrated	teacher integrates history and process
Teacher's Actions	*5. Methods*	1 or 2 T-centered	3 or 4 T-centered	many T-centered
	6. Labs, hands-on, calculators, computers	rare	cookbook or undirected	conceptually focused
	7. T-S interactions about subject matter	little	about unconnected ideas	about conceptual content
	8. T's questions focused on…	factual recall	unconnected issues	concepts & connections
	9. Kinds of assessment	tests & quizzes only	occasionally others	frequently others
	10. Uses of assessment in addition to grading	none	checking Ss' knowledge	checking Ss' knowledge & preplanning
	11. T's responses to Ss' Ideas about Subj. matter	disregards	accepts all ideas	seeks to change unscientific ideas
Student's Actions	*12. Writing & other representative of ideas*	short answers	different reconfigurations of info. provided rare	several
	13. Students' questions	few	procedural	procedural & conceptual
	14. S/S interactions about subject matter	rare	about procedure	about correctness
	15. Student-initiated activity	Ss volunteer examples rare	few	some
	16. Ss' understanding of teacher's expectations	Ss passive or ignore procedures	confusion over procedure	expectancies accepted
Resources	*17. Richness of Resources*	little beyond single format	small number, some hands-on	multiple
	18. Uses of Resources	Located at only,	not related	related to ideas
	19. Access to Resources	T- Controlled Some related		
	20. Decision making	T-dominated	T-controlled some discussion of time use	
Environ.	*21. Teaching aids*	few	Some	Many, related to content
		May not be integrated with content		
	22. Students' work displayed	Similar from all Ss Few	Some	Many

Date of Analysis:

Teacher:

Analyst:

D. EARLY CONSTR.	E. EXPERIENCED CONSTR.	F. INQUIRY	
T & Ss	negotiate understanding	Investigations dominate	1
T's content	based in content & Ss' ideas		
Lead by T	Constructed by T & Ss	Constructed by Ss	2
Identification	& use	As part of problem solving	3
Lead by T	Constructed by T & Ss		
Use of process to	formulate ideas	Applied to investigations	4
Lead by T	Constructed by T & Ss		
S-centered		Question dependent	5
Some	Extensive		
Build on Ss' ideas			6
Lead by T	Constructed by T & Ss	Guided by question	
Clarification &	usefulness of Ss' ideas	S input into goals	7
T-directed	T & Ss have input		
Emerge from Ss' ideas & instr. Goals			8
Occasionally	Frequently	Guiding investigation	
	Multiple forms of assessment		9
Of knowledge & understanding	Mainly of understanding	Arise from investigation	
Adjusting	activities		10
By T	By T & Ss	T & Ss designing investigation	
Considers in instr. decisions	Assessment drives T's decisions	T is co-investigator w/ self-directed Ss	11
Ss use to construct meaning			12
Occasionally/some reconfig.	Frequently	Ss choose form	
Some conceptual, some procedural	Mainly conceptual	Conceptual, applied to investigation	13
Some about procedure	About understanding	About understanding & planning	14
Some about understanding			
Ss contribute examples and analysis			15
May be weakly connected	Pertinent	Guide class direction	
Frustrations with role	Role & procedures negotiated w/ Ss	Ss define role	16
Multiple resources			17
Aid understanding	& application	Integrated into investigation	18
Some	Many		
T-guided	Negotiated by T & Ss	Guided by question	19
Joint decision making			20
Some	Much	Applied to investigation	
Made by Ss			21
Some	Many	Derived from investigation	
Ss' creations			22
Some	Many	Derived from investigation	

Content Teacher's Actions Student's Actions Resources Environ.

Appendix D

Participant STAM Records

Summary of Classroom Observations – Field Notes

Teacher: #1 (Pseudonym: Julie) – Face-to-Face #1

DATE	*A OR T*	*DESCRIPTION*	*STAM Codes*
4/11/12 **F2F**	T1 (10 mins)	(Teacher passes out the At the Bell (ATB) for the day as students walk in the door). START UP: Before the teacher begins the class for the day, a student approaches her and asks to get a laptop from the laptop cart. She pauses and then says, "Absolutely! Today you will need your laptops." (Students then begin to get up from their desks before the class begins and retrieve their laptops.) Teacher then begins talking about activities for the day. Tells the class to sign in on their laptops. Explains that there is a podcast they will be working on today and a wiki that they will be working on as well. She adds that they have 5 outstanding assignments and they will all be working in several locations online at the same time so it will work well.	**19C** **13B** **5A** **12B** **18C**
F2F	A1 (8 mins)	Students are working on today's ATB. Students ask questions about the assignment. SQ: "What does "en punto" mean? TA: It means "on the dot" or "sharp" as in time. Teacher reminds students that they will review yesterday's ATB. She hands that back graded and gives them a chance to fix the ones they had gotten wrong for a grade change. Another SQ regarding the singular or plural of mi familia.	**12B** **13B** **1B** **9C** **11B** **13B**
F2F	T2 (1 min)	Teacher has students put away today's ATB and take out yesterday's ATB for review.	**9C**
F2F	A2 (7 mins)	Teacher has the students read the questions aloud in Spanish from the ATB with the correct answers. When a student answers incorrectly, she asks another student for the answer and the teacher provides the reason why that was the correct answer (ex. Necesitas NOT nesesitan because of the word tu). Another student reads the next question correctly. The teacher repeats, "Si, compran – because we have 2 people!" (The ATB content is conceptual in nature; however, the pedagogical style appears to be didactic. It is teacher-dominated, with students answering	**8B** **7B** **1B** **1B** **7B** **20B** **3C**

		teacher-provided questions. The information explained is presented with set limitations and exceptions according to the Spanish language.	**11B**
F2F	T3 (3 mins)	Teacher then tells the class to log into the class blackboard page. She repeats that today the class will be working on a wiki. She asks the class if anyone has ever worked on a wiki before. No student raises their hand. She then asks if anyone knows what "wiki" means. A student shouts out "Wikipedia" twice. No other student says anything. The teacher tells them that in Hawaii, it means "quick quick" or some people think it stands for "What I Know Is."	**5A** **14A** **10B** **15B** **11B**
F2F	A3 (10 mins)	Teacher guides the class through the announcements posted online. She explains that students will be writing a newspaper article: what it's like to attend school in another country. They have to "post 5 solid questions in Spanish of what it's like to attend school in another country." The teacher has assigned her ESL students from Ecuador, El Salvador, and Puerto Rico to answer the questions by Friday. The students in this class will then turn the q/a into a paragraph. Teacher provided them with an example of Chinese students who attend school until 9pm at night. One student volunteered information about a student they knew who went to school from the afternoon until the evening. Teacher explained to the class that they might want to find out when the students attend school, the courses they took, and so on.	**17B** **18C** **2C** **3C** **15B**
Transition to the Online Class Session	T4 (3 mins)	Teacher encourages students to work physically apart from each other as they collaborate online. Some students begin to move with their laptops to other areas of the classroom. One group of students chooses not to move apart from each other and collaborates aloud instead.	**5E**
	A4 (3 mins)	Some students ask questions before they begin the work. Procedural question: "Should we write our questions first and then go on the Wiki? Teacher answers, "No, go right onto the Wiki. Only one student can edit the wiki at a time." Students regularly sign themselves out for bathroom use during the class time.	**13B**

Teacher: #1 (Pseudonym: Julie) – ONLINE #1

DATE	*A OR T*	*DESCRIPTION*	*STAM Codes*
	T1	Students transition into the online work	**19E**

4/11/12 **ONLINE**	(4 mins)	environment although they are still in the physical classroom. Teacher provides assignments for students to complete: wiki, podcast, video comparisons, listening exercises. Some students have headphones on, some students are recording their voices on the computer in the hallway for the podcast, some students are watching the video and/or listening to the language exercises and answering questions in a paper packet.	**6D** **16E** **5E** **19E/F**
ONLINE	A1 (17 mins)	Some students are working in online collaborative groups (working physically separate but together in the same wiki space); some students are working together in the same physical grouping of tables with the laptops. Students are concerned about the headphones and mics for the podcasts. The teacher sends a student to another area to return with a basket-ful of headphones and convertors. Teacher walks around the classroom to the different tables as students work. A few students ask the teacher specific questions related to the Spanish language (-ar conjugation).	**14E** **17E** **16E** **13C/D** **7C**
ONLINE	T2 (3 min)	Teacher encourages students to work on the procedural components of the online assignments without teacher assistance to simulate the online environment outside the classroom. She assists them with technical difficulties (ex. Headphones not working) and with language questions.	**2D** **10D**
ONLINE	A2 (17 mins)	As students continue to work, the teacher reminds students about the differences in the Spanish translation for "school" – escuela vs. collejeo (?) when they write their questions in the wiki. A student asks the teacher a question related to verb conjugation; the teacher relates the answer back to the ATB. It appears to the researcher that the students must manage their time during this class period to complete the assignments. Teacher acts specifically as a facilitator – answers questions, finds resources for students, and solves the technical problems that may occur. Students who do not know how to create the podcast in Garage Band are directed by the teacher to watch the You Tube video on how to create one. (The video was posted and available in their blackboard class page for this purpose). One group of students works together and speaks out loud with the questions for the wiki. They then post the questions online when they are finished talking. That group does not borrow headphones (for recording the podcast or for	**3D** **8D** **12E** **18E** **11D** **5E**

		listening to the language exercises). The teacher checks on students in the hallway as they work on their podcasts (there were 4 – 5 students who started the podcast).	**18E** **19E/F**
ONLINE	T3 (4 mins)	With about 4 minutes left to the class period, the students began to collect their materials, hand in their ATBs, and return their laptops to the cart. Not much prompting needed from the teacher. An announcement was made on the loudspeaker from the Main Office before the final bell rang. Students dismissed.	**20E**

Teacher: #1 (Pseudonym: Julie) – Face-to-Face #2

DATE	*A OR T*	*DESCRIPTION*	*STAM Codes*
4/12/12 **F2F**	T1 (3 mins)	START UP: Teacher passes out the ATB for the day. Students begin working on it (-ar conjugation worksheet). A student asks if he'll be able to work on his podcast today. Teacher says, "If you have time after the quiz." Students act shocked that there is a quiz today. Teacher tells them that it is on the conjugation of –ar verbs.	**12B** **13B** **18C**
F2F	A1 (7 mins)	Students continue working on today's ATB. Two students ask what the word "acariciar" means? (it's on the ATB worksheet). The teacher says she's not sure; she meant to look it up before class started. The class starts getting loud at this point. They are all talking at once. The teacher raises her voice and says, "OK. Now it's my turn." A student walks up to the teacher and tells her that he has a doctor's appointment and will be leaving at 10 am. She tells him to take a laptop toward the back of the room and get the quiz completed. Teacher reminds the rest of the class that the first page of the packet should be done; if it's not, that's what they should be working on while she sets up the speakers for the next activity.	**13B** **5A** **20B** **10B** **20B**
F2F	T2 (4 mins)	Teacher sets up the computer and speakers for the next activity while students are working at their seats – some are still working on the ATBs, some are working on the packet page, and a few are talking.	**16C**
	A2 (10 mins)	Right before the listening activity begins, a student asks a question not related to the class (SQ: "Are teachers allowed to take your picture in school?" Teacher answers his question related to the context of the policy regarding the 'do not photo list.' "	**15B**

F2F		ACTIVITY BEGINS: A language speaker says a sentence in Spanish on the computer and the class repeats it together with the teacher leading the group. Teacher walks around the classroom to the students as they repeat the sentences. The second listening activity from the speakers also involves the whole class listening to the speaker – this time they listen to the explanation in Spanish and choose the correct illustration they are describing on their page in their packet. The third listening activity is a multiple choice exercise where the speaker says a sentence and they have to choose the correct answer in their packets. During all of the listening activities, the teacher continues to walk around the classroom. The student who was taking the online quiz finishes, puts his laptop away and joins the class activity. There are some students who appear confused and "lost" during the listening exercises. One student stands up and gets a tissue, two others are quietly talking, two others are sharing/comparing answers in their packet.	**14A** **16C** **12B** **8A** **5A** **1B** **7B** **16C** **14A** **12B** **19C** **16A/B**
F2F	T3 (2 mins)	Teacher turns off the speakers and tells the class to complete page 30 in their packets. They have 5 minutes to complete the task. They "can do it alone, with notes, with a partner – just get it done quickly."	**20B** **17A**
F2F	A3 (8 mins)	Students work in the packet. Most are working in a group of three. There are two groups of two, and one student working alone. One student gets up from her original group she was working with and moves to another group to complete this assignment. One of the members of this new group is from Puerto Rico and is a native Spanish speaker.	**14B** **12B** **5B**
F2F	T4 (5 secs)	Teacher transitions into reviewing page 30 by calling on a student to read the question aloud in Spanish since the groups still are not completed with the assignment.	**15A**
F2F	A4 (4 mins)	Students read the questions aloud in Spanish from the packet (pg. 30). Students who don't know the answer or who take too long to answer are passed over. The teacher leads/guides the students how to answer the questions based on the English translation. Teacher reminds students to review –ar verbs. Teacher collects packets to ensure students are	**11A** **20B**

		"on track/keeping up" with the work.	
F2F	T5 (1 min)	Teacher passes out a logic puzzle for the class to work on. Teacher explains the directions: true-false-possible.	**9C** **5A**
F2F	A5 (9 mins)	Teacher reads the directions from the puzzle in Spanish. She asks the class if they understand it. They generally all nod their heads yes. She then has different students translate the information into English since it is important for them to answer the questions. Teacher then reads the first question in Spanish and then immediately translates it into English. She then reads each question in Spanish. It appears this may be done to keep the students on task. Teacher then reviews each question with the whole class to see if there is a general consensus with the correct answer (true-false-possible). There is consensus with only the first question. The rest of the class appears confused with the information; some students get the right answers; some appear to guess at the answers. The entire class hands in their logic puzzles for a grade after the class has reviewed it together.	**8B** **10B** **5A** **10B** **16B**

Teacher: #1 (Pseudonym: Julie) – ONLINE #2

DATE	*A OR T*	*DESCRIPTION*	*STAM Codes*
4/12/12 **ONLINE**	T1 (5 mins)	Students transition into the online work environment although they are still in the physical classroom. Students go to the cart at the front of the classroom to retrieve their laptops. They individually log into Blackboard page for the class. Teacher tells the class that they have 20 minutes to complete the online quiz. The quiz is made up of matching and multiple choice; it is based on conjugating –ar verbs. She tells the class to look them over before opening the quiz. She also reminds them to put away all materials before they start the quiz. (Students stay in their groups to take the online quiz.) Teacher explains how to navigate to the quiz –	**19E** **18E** **20E** **10C** **9D** **1D** **5E** **17E**

		announcements and then the link to the quiz. She tells them that when they finish, they have assignments left from yesterday – podcast, wiki, and listening exercises. Teacher warns students that the online quiz immediately grades them – spelling counts – be careful!	**9D** **2D** **1D**
ONLINE	A1 (14 mins)	Only a few students look at their –ar verbs before opening the quiz. Some still leave out materials after opening the quiz. The teacher walks around the classroom and turns over several papers for different students. All of the students have the quiz open within 3-4 minutes of the transition. Some students ask the teacher questions about the quiz as they are taking it – specific language questions, not related to the computer. (During the quiz, two students from another class come in and make an announcement about a basketball tournament and hand out flyers to interested students.) As students are still taking the quiz, the teacher explains to students that the test is a word bank unto itself – the first couple of questions could help answer the other questions later.	**16C** **16C** **14C/D** **13C** **7C**
ONLINE	T2 (5 min)	Teacher checks on students as they finish the quiz. She reminds the class again that they have assignments from yesterday that they need to complete. She also makes an announcement about another activity that is due tomorrow that they can start on today. She shows the class where it is located on their Blackboard page. It is an assignment involving any 2 games involving verbs and vocabulary. When they are done playing the games, they have to take a screen shot and upload it into the drop box for that activity. It is a participation grade worth 10 points.	**6D** **5E** **18E** **2D** **3D**
ONLINE	A2 (13 mins)	As students are finishing the quiz, most are choosing one of the assignments to work on from the online Blackboard page. Most students begin work immediately, whereas two are not working at all and are instead flipping through the Emergency Planning Manual for the classroom. Teacher has to go to them and get them back on task. The one student is having technical difficulties with headphones/connections to the computer. She warns them that if they cannot get to work, she will separate them. There are several groups that are helping each other with questions about the assignments,	**19E** **18E** **16E** **16A** **14D**

ONLINE		navigating the site, and questions about the language. The same student is still working alone. Two students are sitting together but appear to be working on separate assignments. One student's laptop crashed/froze and was waiting for it to re-boot. The classroom is fairly quiet as they are working on their different tasks simultaneously.	**16E** **12E** **15C**
ONLINE	T3 (5 mins)	With about 5 minutes left to the class period, the teacher reminds students to completely log off their computers, not just close the lids. She reminds them to submit the games tomorrow! Lastly, she reminds them to had in their ATBs and logic puzzles. Students begin returning their laptops to the cart.	**20E**

Summary of Classroom Observations – Field Notes

Teacher: #2 (Pseudonym: Robert) – Blended (Face-to-Face and Online) #1

DATE	*A OR T*	*DESCRIPTION*	*STAM Codes*
5/07/12	A1 (5 mins)	Students are already reading quietly at their individual desks when the researcher enters the classroom (class began about 1 minute prior).	
F2F		The teacher explains to the whole class as they are reading: when you are done answering the questions, give it back to the person who created it. If you get any wrong, make sure the person tells you why and this is why I think my answer is better than yours. (On Friday, the students were responsible to create several test questions to prepare for today's test. They then exchanged them with another student. They answered each other's questions and then corrected the answers to their questions. They also provided feedback to each other before today's test.)	**3D** **10C** **9C**
		Some students partner together to talk about their questions and answers. They give each other feedback about the content. There are some discussions occurring throughout the classroom.	**14C** **16C**
		As the students share their answers, the teacher asks the group, "Did you find that writing these questions on Friday helped for the test on Monday?" One student answers – "yes, it would have been better, though, on Thursday."	**11D**
	T1 (8 mins)	The teacher tells the students to get their laptops when they're done with the activity and login. A student asks the teacher, "What happens when we're done getting them [Q/A papers] back from our partners?" The	**13C**

F2F		teacher answers, "You're going to give them back to me." There is some social discussion between the students as they get their laptops from the cart (i.e. what they did over the weekend). There is also some discussion about reading the chapter over the weekend to study for the test. As the students are getting logged into the class' Moodle page, the teacher tells the whole group, "I will grade your DBQs as you're taking the test." The whole class cheers! A student asks the teacher, "Do we have to use Firefox?" Teacher: "Yes. Now go down to Chapter fourteen." He provides the password for them to take the test online. The teacher makes a few jokes with the students but gets serious when the tests are opened.	**14C** **9C** **10C** **13C**
ONLINE	A2 (40 mins) – dependent on the students	Students begin the online test using the moodle platform. The teacher watches their progress from the back of the classroom. As the students work, the teacher answers some individual questions of students quietly. He becomes a facilitator within the classroom. He answers specific questions related to the test questions, not the technology or other logistical questions or issues. The test consisted of multiple choice, true/false and short answer questions. (Although the desks are aligned in rows and student screens are facing the other students behind them, the teacher has randomized the questions and the answers within the questions to minimize the chance of students' cheating).	**9E** **7C** **13C** **12F**
ONLINE	T2 (3 mins)	Teacher transitions into the next activity for the students who have completed the test. They are to go to "Lecture #12 from Yale University" and listen to the whole lecture. They must go to the back of the classroom to do this, though, to minimize distractions for the rest of the students who are still taking the test.	**18E** **19E** **20E**
ONLINE	A3 (25 mins) – dependent on students	One of the students uses his headphones and sits in a desk in the back of the classroom; five other students sit on the floor on opposites sides of the classroom and try to listen to the lecture on their laptops without using headphones. One of the students gets frustrated and goes into the hallway to the listen to the lecture instead. One of the students calls the teacher over and tells him that the lecture is hard to understand since it sounds muffled with the sound down low. The teacher tells all	**16E** **5D** **17E** **19E**

		of the students who are currently listening to the lecture that there is a transcript available of the lecture that the students can listen to either instead of listening to the lecture or reading in conjunction with the lecture. The teacher constantly rotates throughout the classroom to check on students and their work progress on the online test and/or the online lecture assignment. As students are finishing their tests, they receive immediate feedback through the online system of what they had gotten correct and incorrect and why. They also receive a raw score.	**18E** **17E**
ONLINE	T3 (2 mins)	All of the students except for one have completed the online test. The teacher briefly explains the grading procedure to the class due to the issue of short answer questions on an online exam. He explains to the students that their score is actually out of 110 points, not 130, since he has to go back into the system and manually grade their essays/short answers. The computer cannot do that.	**16C** **9E**
ONLINE	A4 (5 mins)	The teacher then assigns random numbers (1-6) to each student in the classroom. He then tells them to go and sit with their number groups and watch or re-watch their number section of the Yale lecture. The teacher explains to the students that each group will give a creative presentation to the class of the information they have been assigned from their section of the Yale lecture. They can use technology or not. He says, "Do not stand up in front and lecture." He explains that they will present first thing on Wednesday (two days from today). They will be given 25 minutes tomorrow to "get it together." He provides tips to Group 1 to listen to the professor's previous lecture as an introduction to their presentation and to Group 6 to listen to the following lecture as a conclusion to their presentation.	**20B** **5D** **6D** **20B** **3D**
ONLINE	T4 (2 mins)	The teacher asks a few individual students what they thought of the Yale professor's lecture? The students responded by saying that the lecturer kept talking and talking; another said that they were so bored they couldn't keep up; another said the transcript was better to read than to listen to him. Students put the laptops away at the end of the class.	**11D** **16E** **19E**

Teacher: #2 (Pseudonym: Robert) - Blended (Face-to-Face and Online) #2

DATE	*A OR T*	*DESCRIPTION*	*STAM Codes*
5/08/12 **ONLINE**	T1 (1 min)	START UP: The teacher explains to the students that they are to get in their groups and create something innovative and exciting for their section [that they started were assigned yesterday]. The teacher says,	**3D** **9E**

		"123, Go! You must be finished when the hand on the clock is on the 11. (app. 25 minutes)	
ONLINE	A1 (25 mins)	Students work in groups and get their laptops; they work on the sections that they were given yesterday in class. Some of the groups are talking about making a movie. The teacher comes over to the group and asks them what they plan on doing for the presentation. The students explain that they want to do an XtraNormal movie on the Internet to present the information. The teacher asks them why they don't make a movie of themselves instead. He offers use of a flip phone, flip camera, etc. The students laugh and say, "No. We need to work with what we have. We don't have a lot of time to do this." Another group is working on the assignment/activity and asks the teacher about the content of their section that they have to present, including information pertaining to the "Guns of August." The teacher explains the historical reference for them and adds that it is valuable information. He further recommends that they read the book in the future. Another student asks the teacher if she can print the transcript from the Yale lecture. "Can I take this to the library to print it? I can't read this without it being printed. I need to highlight it!" The teacher speaks to her and explains, "You don't have time to print it right now and you can still highlight it on your computer. You read stuff all the time! You can also make it larger [on your computer screen]…" Four of the six groups are planning to present their information tomorrow using XtraNormal, while the other two groups are planning to use Prezi. (Although the students were not required to use technology to present, all of the student groups chose to use technology to do so.)	**5D** **14E** **12F** **19E** **18E** **13E** **7D** **1D** **13C** **16E** **17E** **18E** **19E**
ONLINE		As the student groups work on this activity, there is student-to-student interaction between the members of the groups. They are intent on getting the information from the Yale lecture for their section and getting an idea started for the presentation. They are required to finish the presentation outside of class and to collaborate online/on the phone, etc. They will be presenting as soon as they walk into the classroom tomorrow morning. The teacher-to-student interaction includes conceptual content and application of ideas; the teacher spoke at length and in depth with the one student group about the applicability of the lecturer and the "Guns of August."	**14E** **2E** **7D**

		The teacher asks students in another group as they were finishing up, what they thought of the Yale lecturer. One of the students answered that he learned more from listening to himself repeat some of the information back to the teacher than he did from the professor in the video. The teacher asked another student what he thought about the activity. The student answered that he felt he could do more if he had more time, like acting it out, but he plans to just do an XtraNormal presentation instead. Since the activity must be completed at home, beyond the extension of the classroom, one of the students is logging into his XtraNormal account using his Smart Phone. The groups will have to contribute and collaborate with him online.	**11D** **10D** **5D** **6D**
F2F	T2 (4 mins)	The teacher tells the students to close up their computers. He says, "Let's take some notes!" Students put their laptops away in the laptop cart while the teacher turns the Smart Board on and the projector for the lesson to begin.	
F2F	A2 (20 mins)	On the Smart Board is the title, "Chapter 15: The Crucible of War: 1861-1865" The teacher is now physically in the front of the classroom and the students are seated in their desks with their notebooks out. As the teacher changes the slides, there are various pictures representing the people or the theme of what he is discussing. (ex. Abraham Lincoln, Jefferson Davis, book covers depicting the Civil War, etc.) As the teacher speaks, students write notes from the slides. The teacher's content material draws connections between Lincoln and Buchanan (differences); he also speaks about real-world events – the Civil War and the events preceding the War. Students are willing to volunteer information throughout the lecture: a student shares that her family visits/lives on Okinawa, another student reads a Lincoln quote aloud in a "Lincoln voice." The teacher also gave them another real-world example of the soldiers from the South and the soldiers from the North exchanging goods and playing cards at night and the next morning, going into battle against each other.	**20B** **16C** **6A** **17C** **1C** **2C** **12A** **15C** **2C**
F2F	T3 (1 min)	Teacher transitions into the next activity; he plays a section of the documentary, "The Civil War," by Ken Burns.	**19A**
	A3 (20 mins)	The teacher plays a section of the movie called, "4:30 a.m. April 12, 1861" about the beginning of the Civil	**18A**

		War. Since the Smart Board is a little difficult to see for some students due to the classroom lighting, the teacher also turns on a secondary source of video (TV screen). Although it is smaller than the Smart Board, it provides better contrast.	**19A**
F2F		The teacher makes a few comments for the students' benefit regarding the amount of pay received by Ulysses S. Grant at his job at the Post Office and to also make a brief comment about Sherman to ensure that the students recognized his name.	**5A** **10C**
		The teacher pauses the movie at one point to emphasize the person pictured on the screen. He asked the class if they knew who he was. It was Nathan Bedford Forrest – the person Forrest Gump was named after and the Confederate general who was the founder of the KKK.	**10C** **7C**
		As the movie continues, the voice-over presenter talks about the speed of the trains during the Civil War; the teacher pauses the movie once again and emphasizes this point. He tries to connect their knowledge of speed with the perspective of someone in the 1800s. He used the comparison of riding a horse to riding a train going 30 mph and how fast that would seem – "like a crazy train!"	**7C** **2C**
F2F		A student asked the teacher if the movie included any more information or references to West Point because his brother went there and he went to visit him there. (There were some earlier references to some soldiers who graduated from West Point before joining the War effort.) The teacher said no, but asked if he was interested in West Point. The student explained that at West Point there was information there about the Civil War – how the graduates at the time were allowed to choose their sides.	**13B** **15B**
	A4 (10 mins)	[There was no transition back to the notes] Teacher says, "Okay. We're back to the slides. We've drawn the sides now."	
		He draws connections to the training in today's military to the training that occurred then in the Civil War. He spoke about the length of time involved as well as the specific formations and/or sequences with arms and ammunition the military had to train for.	**1C** **2C**
		He then showed a map of the U.S. after Fort Sumter. A student asks a question: "The slave states that were loyal to the Union, will they release the slaves or not after Fort Sumter?" The teacher says, "No." He provides an explanation of Lincoln's viewpoint of wanting to bring the Union back together however it is	**17C** **13C**
F2F		possible – even by allowing those states deemed loyal to maintain slavery. He also explained that the	**7C/D**

F2F		Emancipation Proclamation did not free the slaves in those loyal states. It only freed slaves in the seceded southern states, who would not have released them anyway. Another student asks, "Did that cause conflict with the states that were loyal?" (Delaware, Maryland, and Missouri) The teacher answered, "Yes. In those three states as well as in the free states." Another student asked a question about the Western territories. The teacher briefly explained that settlers in those territories fought very minor skirmishes but nothing of note. The teacher finished the lecture with two guiding thoughts: What the South fought for and What the North fought for. He briefly spoke about the idea of the War being a "poor man's fight in a rich man's war," meaning the majority of people in the South who owned slaves were the rich but the soldiers who were fighting to maintain the right to own slaves were the poor. They fought to maintain their social hierarchy that was built in the South rather than the potential idea of ever owning a slave themselves. The teacher also used the comparison of religion and values to try to connect for the students why people would go to War. The Northerners trying to push their ideals on the Southerners, etc. A last student question was "Does Great Britain still basically run the world at this time [in history]?" The teacher answered, "Yes. We'll talk more about that as we go on."	**13C** **7C** **11C** **8C** **7D** **11C** **13C**
F2F	T4 (1 min)	The teacher asks the groups one more time of what they plan on using as a presentation tool. The majority say XtraNormal, the other groups say Prezi. He reminds the class that they must work on the assignment outside of class and they will present as soon as they come in tomorrow morning.	

Summary of Classroom Observations – Field Notes

Teacher: #3 (Pseudonym: Joseph) - Blended (Face-to-Face and Online) #1

DATE	*A OR T*	*DESCRIPTION*	*STAM Codes*
5/10/12 **F2F**	T1 (5 mins)	The teacher begins by explaining the days activities: we'll watch a video if the technology works… it deals with particular types of parenting and then we'll discuss it. Tomorrow we'll have a child abuse presentation. The teacher starts the video/movie using the Smart Board technology with audio.	 **19A**
F2F	A1 (5 mins)	The movie title: "OCD: A Young Mother's Story." The movie begins – the teacher tells the class, "Pay attention to this! I'm going to try not to stop this – I'll yell over the movie when I want you to pay attention to something." A student talks to another student (quietly), as she watches the video, and comments, "Why are white people always afraid of people kidnapping their babies? Why do white people keep their babies on leashes?" The other student looks at her and just smiles. The teacher brings to the attention to the class the OCD tendencies of the mother walking her baby – moving the stroller over the cracks sideways, avoiding the cigarette butts on the ground with the wheels of the stroller, etc. The teacher says aloud, "God bless her – she's insane." A student volunteers information to the teacher about the fact that her sister has OCD – she washes her hands too many times; she takes up to 20 showers a day. The video ends with the young mother's husband speaking about the OCD tendencies getting worse after she gave birth to their young son.	**17C** **14B** **7A** **5A** **20A** **15C** **1B**
F2F	T2 (1 min)	The teacher explains to the students, "We don't know the connection to women's pregnancy and OCD tendencies – but we can guess!" This, though, is extreme…"	**5A**
F2F	A2 (8 mins)	Teacher transitions into the lesson… So, what are some of your thoughts about this young mother? Student #1 asks, "How does she change a diaper?" Student #2 says, "Maybe she has her husband do it!" Student #3 asks, "How long does it take her to take a walk?" As the class briefly discusses the mother taking a walk with the child in the stroller, they continue to talk about the issues of her and the cigarette butts on the ground. The teacher tells the class, we know that this type of behavior is not acceptable for society and for us here in the classroom but… think about the baby in the cart.	**11C** **13C** **7C** **1C** **2C** **7C**

F2F		What kind of effect, do you think, the mother's behavior has on him? Remember, we talked about modeling and bonds between parent and child… The teacher helps make connections between the content on the video and information they have already received. The students answer that the child may become like her because he is imitating her behavior. The teacher continues – he briefly explains the full version of the video he had seen of this mother taking the child on the walk where she is avoiding the cracks. The teacher asks the students if they remember the nursery rhyme, "Step on a crack and you'll break your mother's back…" The students say yes… The teacher explains that this mother was humming it to herself as she avoided all of the cracks with the stroller except she sang, "Step on a crack and you'll break the baby's back." He further explains and connects for the students that this mother seems to have been predisposed to this behavior based on her husband's interview and some of the information he provided.	**7C** **1B** **2C**
F2F	T3 (3 mins)	The teacher then tells a personal story of his son and his wife to make a connection and use a real-world example to key ideas for parenting styles and some possibilities of predisposition… he told them of a brief conversation his wife had with his son before his son (who is 18 years old) went to work – she reminded him to be careful so he didn't slip on a spoon and hurt himself. The point of his story was that having one parent who is an extremist and one who is a little more relaxed and reasonable, can lead to a better balanced child rather than just having one parent who has extremist tendencies like the parent in the video.	**2C** **3C**
F2F	A3 (25 mins)	The next part of the lesson content begins: Teacher asks the class, "What type of parenting do you see in your own realm?" A student answers, "Strict – Marine for a father and old-school religious Puerto-Rican mother." Another student answers, "Like your friends – want to be your friend; but it's okay. I like it. My mom is mad cool." The teacher gave an example of a friend's father who is "strict" but the kids like to hang around with him because he does interesting things. He transitions back to the type of parenting styles and tells the class that they are correct: there are the strict ones, the ones who want to be friends, but there are also the neglectful ones and the ones who are just plain old mom and dad. He flips to the slide with the four Baumrind's Parenting Styles on the Smart Board. (Authoritarian, Authoritative, Permissive, and Neglective). The teacher explains each of	**11C** **8B** **15C** **2C** **1B** **1B** **2C** **3C**

		the styles in depth with examples of each: families he had known in his childhood. He also briefly related each parenting style to the generations and the generational styles and differences. A student volunteers information related to the topic: "my dad freaks out if I'm one minute late…" The teacher then gives an example (explanatory – making connections and applying the content): he gives a "grace period" of five minutes to his son. The lesson continues: Authoritarian parenting – Authoritative Parenting – Permissive parenting. The teacher talks about the effects each parenting style has on the child(ren). He then provides some tips/suggestions on how to be an authoritative parent.	**12A** **15C** **2C** **1B** **1B**
F2F	T4 (1 min)	The teacher talks about the student presentations. He figures out which students still have to present and when they will do so.	**20A**
F2F	A4 (5 mins)	Two students give a brief presentation to the class about phonemes/language/semantics. They use the Smart Board and Power Point. Within the Power Point presentation, there are pictures and words for them to discuss their topic. They are the ones who have accessed the technology for the presentation, although it is at the front of the classroom. They are the only students to present this class session. Other students listen while they present.	**6B** **19C** **16C**
ONLINE	T5 (1 min)	The teacher tells the class to pair up with a classmate. He reminds them that he asked them to bring a textbook with them to class today. He suggests that they use the amount of texts available to them – share and use the ones that are always available in the classroom. The teacher also tells the students to use whatever available resources are there for them to complete the assignment he is giving to them: the Internet, Moodle page, computers, textbook, notes, each other, etc. Students get the laptops from the cart to begin the assignment and the teacher distributes "Myths about Infant Development." He further explains that they have to be in common agreement with each other (partners) before they can move on from question to question.	**5D** **17C** **18D** **19D** **17C** **19D** **20D**
ONLINE	A5 (30 mins)	The students pair up together and they all retrieve a laptop computer and access the Internet for Google searches as well as the class Moodle page. Some pairs also use the textbook and a majority of students also use their notes to answer the questions. There is a variety of student to student interaction occurring among the students. They mainly discuss the	**19D** **17C** **5D** **14D** **16C**

		content information on the sheet. One student is also looking up her current grades from another class and is telling her partner about them. The students are coming to consensus before moving on the to the next question. The content of the sheet is explanatory with the concepts central to the main ideas. Students write down their answers to the myths and explain why they believe the myth is true, false or a mix of both. As the students are working, the teacher checks their progress to determine if they have enough time to complete the assignment.	**2E** **1C** **2E** **5D**
ONLINE	T6 (1 min)	The teacher tells them to finish up and put away the computers. He offers to answer any emails if they have questions on the assignment tonight and reminds them to work on this at home if they don't finish it.	**10D**

Teacher: #3 (Pseudonym: Joseph) - Blended (Face-to-Face and Online) #2

DATE	***A OR T***	***DESCRIPTION***	***STAM Codes***
5/11/12 **Transition**	T1 (6 mins)	START UP: The teacher begins by explaining the rest of the school year and the remaining days. He reminds them that if they're seniors, they only have 12 days of school left and progress reports go in the mail on Monday (today is Friday). Juniors will only have a few more days. I've paced the work for you but still – it's overwhelming! The teacher transitions into the students groups that were formed yesterday. He tells the students to find their partners to review their answers.	
ONLINE	A1 (5 mins)	The students pair up again and take out their laptops and other resources from yesterday. They discuss their answers with one another to ensure they have consensus as well as the explanations to their answers.	**6D** **5D** **14D**
ONLINE	T2 (1 min)	The teacher briefly reviews which student presentations still have to be given.	
ONLINE	A2 (25 mins)	Teacher transitions into the activity: The class begins to review the worksheet together that they worked on in groups using the technology both in and out of the classroom. The teacher asks the students why they think the question, "All behavior in humans is learned" is false? A student answers, "What if someone is born with autism." The teacher says, "Good. What else?" Another student answers, "Nature versus nurture." A student answers another question using his own experiences; another student remembers a video the teacher showed them and relates/makes a connection to that previous knowledge.	**12D** **15E** **7D** **8C** **2E**

ONLINE		Another question: a group answered that they used the Internet to look it up because they couldn't find the answer: the fact that infants understand addition and subtraction in a very basic way. Another group used their own ideas and knowledge base to answer the same question. The teacher requires the class to provide alternative solutions to the answers as long as they explain how they had gotten to the answers and that they make logical sense. The teacher begins to close the section on parenting styles and students provide their own opinions on what they would prefer to be: authoritative, authoritarian, permissive and why. One student explains that it is better to be "middle of the road," rather than to any extreme; another student says that it is better to teach kids from their mistakes and not hide anything from them and/or do anything behind their backs. A student asks the teacher if the parenting styles are simply generation-specific. He asks, "Do you think we are moving more towards a more permissive society as a direct response to authoritarian parenting? The teacher and the class discuss this topic. The class then got into a discussion about generational differences regarding parenting styles: authoritarian vs. permissive as the two extremes and authoritative as the "middle of the road."	**11D** **3D** **4C** **15E** **15E** **13E** **7D** **9B**
F2F	T3 (5 mins)	The teacher transitions into the lesson for the day: Child Abuse. He explains his previous experiences before teaching with MH/MR (Mental Health/Mental Retardation) and as an investigator who followed cases of elder abuse for the state. He explained that due to the sensitive nature of the subject, today's presentation is going to be given in a Power Point presentation rather than by using a movie. A student asks a question as the teacher sets up the Smart Board regarding the current event around December of last year involving the judge who was brought up on charges of physically abusing his daughter with a belt while being a judge who tried child abuse cases.	**20A** **13C**
F2F	A3 (40 mins)	The lesson content begins: Teacher discusses Child Protective Laws in PA including the two protected classes: senior citizens and those under 18 years old. A student volunteers information of the number of child abuse cases reported in PA as being lower than they actually are because the child protective laws are not very solid. He explains that he did a project on it for another	**1B** **15C**

		class. The teacher continues: there are three types of abuse: physical, emotional, and sexual. The teacher provides the class an example of when his son was about 6 years old and was playing the game, Mousetrap. He fell on the game pieces and poked his eye – his wife ran to the emergency room with his son and the police were called to interview his son and his wife separately to determine if it was a case of abuse or if he was really just playing the board game. He continues: definitions are provided of alleged perpetrator, victim, and caretaker. The teacher provides the ages of each. He also explains what physical abuse is: burns, bruises, shaken baby syndrome (there are some pictures shown from the Dept. of Welfare training sessions). The teacher provided an example to the class of when a student came to school with bruises on her ankles of fingertips; she was a cheerleader who was on the top of the pyramid in the formation – that is where the bruises came from – not an abusive situation. He also showed pictures of accidental burn and inflicted burn flows on a victim. The teacher also discussed symptoms of shaken baby syndrome: lethargy, difficulty breathing, seizures, etc. He further described Child Neglect: medical neglect, failure to thrive, living conditions, supervisory neglect, drug and alcohol abuse. He showed pictures of homes in the local area where children and animals were removed due to unsafe and unsanitary living conditions. Lastly, the teacher spoke to the class about mandated reporters: who they were, what they were responsible for and why they would be mandated reporters: for example: the funeral director, the coroner, an optometrist, teachers, etc. He shared resources with the class including the guidance counselors' names and information.	**1A** **2C** **1B** **1C** **2C** **18C** **17C** **18C** **3C** **1B** **18C** **10B** **9B** **9B**
F2F	T4 (1 min)	The teacher reminds students to hand in the papers they had reviewed and to return any computers to the cart.	**20A** **19C**