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SUPPORTING THE INTEGRATION OF TECHNOLOGY IN THE SECONDARY CLASSROOM

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ABSTRACT

This qualitative research study examined the experiences of secondary teachers when they integrated technology into their classrooms with the support of a technology coach. Teachers and the coach met to plan lessons and determine appropriate resources and technology tools that would enhance student learning. The study was conducted at a suburban high school in Pennsylvania. The teachers in the study taught a range of content areas, including English, science, special education, and English as a Second Language. Their backgrounds and comfort levels with technology varied. The study focused on meeting the current level of each individual teacher and progressing forward.

Analysis of the data found that teachers reported improvement of engagement, motivation, and comprehension with their students when using technology. Teachers also valued the role of the coach for support to brainstorm ideas, co-plan lessons, co-teach lessons, and model technology tools in the classroom. New roles for students, teachers, and coaches emerged: student as expert, resource gatherer, and technical assistant. Effective professional development methods and strategies included hands-on learning and co-planning with teachers.

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the past few months, especially Gerry and my LDBF, Beth. Thank you all for being there for me during my tough times and celebrating my small accomplishments along the way.

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RESEARCHER STANCE

A typical high school classroom, in my experience, consisted of students' desks in rows, one behind the other, with a teacher standing in front of the room lecturing to students about the content they are studying. I would walk into class, sit in my seat, open my book and notebook, and begin taking notes. This was the routine from when the bell rang to begin class until the bell rang to end class. At times, we would ask and answer rote questions and review vocabulary from the lesson. We worked in groups, but the "noise" level had to be at a minimum, which usually meant we were at a whisper while working. A "noisy" classroom ultimately signified that students were not working on their assignments and were involved in off-task activities or discussions.

However, one of my high school classes was different and firmly stood out from the rest. When I would enter my calculus class, the atmosphere for learning was different. Dialogue from the teacher and students was a large part of instruction. My teacher would challenge us to take our skills and apply them to situations outside of the classroom. We were encouraged to work in groups and discuss problems in a normal speaking tone, which provided us the opportunity to be fully engaged in the lesson. My teacher was confident that we were, and we most certainly were, involved in the assignment given to us. Often, the teacher had us go

to the chalkboard for the entire period. He would give us equations and we would work with our peers to figure out the answer. My teacher was in the back of the room for support if needed. We were provided time to grapple with the problems before he stepped in. I looked forward to going to his class. The learning environment was student-centered and designed to be safe for students to ask questions, which enhanced my eagerness about mathematics. This experience was the main reason I became a teacher. I wanted to spark desire and enthusiasm for learning in students as my teacher had done for me. Even to this day, I enjoy computing equations. It was because of my teacher's teaching style that I felt like a part of the group and had ownership in my education

When I first started my professional career, I was a preschool teacher. For me, it was a challenge to work with such young students. I wanted to model what my math teacher had taught me and quickly realized that my natural fit would be with older students. My next position did indeed target an older audience as I became a staff developer. The position consisted of working with thirteen school districts, providing professional development in mathematics to teachers.

During in-service days and after-school sessions, I would teach kindergarten through twelfth grade teachers research-based practices to help the abstract concept of mathematics become concrete. I enjoy my

position as a staff developer. There are many great teachers that are motivated to help students achieve to their fullest potential and whole-heartedly believe in their students, and I am fortunate enough to work with some of them.

A few aspects about being an outside staff developer bother me. On the positive side, working with multiple school districts allowed me to gain insights that I may have never known about. Differences in student populations, contracts, budgets, and administrations created each situation to be unique. I learned from these experiences and was able to share these bona fide strategies and hints that worked to similar school districts. On the other hand, I would conduct my professional development session and leave. Sometimes, I would never return to that school, and so my sessions were “drive-by” professional developments. I often wondered what happened after the professional development ended. Did the teachers implement the strategies learned in the session? If so, did they implement them to fidelity? What questions or support did they still need?

Another drawback for being an outside staff developer was that I never fully knew my audience. I came into the school with a broad description of what the administrator thought the staff needed and created a professional development based on this information alone. The opportunity to directly interact with the teachers to align their needs with

the professional development never occurred. This created a negative connotation for professional development, declaring it was not relevant to the teachers' classroom. This led to another drawback as an outside staff developer; I was unable to establish a trusting relationship with the teachers that I provided professional development for.

During the third year as a staff developer, I was presented with an exciting professional opportunity to help alleviate my concerns. Pennsylvania Department of Education launched an initiative called Classrooms For the Future (CFF). The CFF grant was designed to implement technology into every core content area classroom in secondary schools. The schools received funds for each classroom to purchase an interactive whiteboard, LCD projector, laptop cart. Along with these tools, money was provided to hire an instructional technology coach to work with the teachers. The coach's responsibility was to provide hands-on support and give on-site professional development. I accepted the position as the CFF coach.

CFF aligned to what I have believed to be an effective learning environment and is similar to my beloved high school math class. Students would have opportunities to collaborate in projects, apply content to real-world applications, and teachers act as facilitators to guide

students' learning. Dewey (1997/1938) reiterates what I hoped to accomplish in this position:

> I think that a good deal of the current opposition to the idea of organization is due to the fact that it is so hard to get away from the picture of the studies of the old school. The moment "organization" is mentioned imagination goes almost automatically to the kind of organization that is familiar, and in revolting against that we are led to shrink from the very idea of any organization. (pp. 30-31)

I worked with teachers to make the transition from the traditional "old school" classroom model to a more unconventional 21st century classroom learning environment.

As a CFF coach, I work with one school building. I am able to perform professional development sessions and then follow-up with the teachers. If any questions arose after the instruction, they know how to contact me. I have extensive background knowledge of the school and its teachers, creating the trusting relationship I have sought. Finally, I felt my "drive-by" professional developments were going to be a thing of the past.

I would like to emphasize that I do not believe technology is the cure in promoting student achievement. It is only a tool to aid in instruction. As Delpit and Dowdy (2002) say "it is not the bag of tricks but the general attitude of a teacher that is important" (p. 101).The way

teachers use the technology will impact student achievement. For example, solely showing a video in class does not promote comprehension of the subject matter. The lesson needs to be planned out, including, but not limited to, standards, various teaching strategies, informal assessment, higher order thinking skills and activities, and authenticity.

After carefully considering my experiences as a high school student, staff developer, technology coach, and a believer in collaboration and utilization of technology in the classroom, I designed an action research study to determine the effects technology and instructional coaching will have on teachers. The purpose of this study is to observe findings that occur when teachers work with a coach to utilize technology in their classroom. I formulated my research question to be: What will be the observed and reported experiences when supporting the integration of technology in the secondary education classroom?

LITERATURE REVIEW

Introduction

Prensky (2001a) states, “Our students have changed radically. Today’s students are no longer the people our educational system was designed to teach” (p. 1). Students learn and retain information differently than they had in the previous years. They are accustomed to instant feedback and gratification. They are visual learners and excel at multi-tasking. Traditional education practices are not designed to instruct in this manner. Technology and 21st century skills need to be integrated seamlessly into the classroom curriculum.

Implementing change is never an easy task. Instructional coaches can help alleviate fears and the uncertainties of change that educators may experience. They provide teachers with one-on-one support and practical applications for instructional strategies.

Twenty-First Century Learner

Technology has been interwoven seamlessly into the lives of 20th century learners (Prensky, 2001a). An average student in college has spent less than 5,000 hours reading, yet has played video games for over 10,000 hours. Other forms of technology, such as cell phones, instant messaging, social websites, Internet, and emails consume a large portion of their lives. Prensky refers to these students as *digital natives,* “native

speakers of the digital language of computer, video games, and the Internet" (p. 1). On the other hand, *digital immigrants* are "not born into the digital world, but have, at some later point in . . . [their] lives, become fascinated by and adopted many or most aspects of the new technology" (p. 1-2). Some characteristics of digital natives are: they are social learners, they prefer instant gratification and feedback, they are able to multi-task, they are visual learners, they prefer games over work, and they obtain information instantly. In contrast, digital immigrants learn in a linear fashion, in isolation, and in a slow, serious process.

What does this disconnect mean for education and our students? Prensky (2001a) quoted a high school student saying, "Every time I go to school I have to power down" (p. 3). Hence he suggests that teachers need to rethink their content and pedagogy. First, reconsidering pedagogy is not meant to alter the important information students must know; rather it is to be presented at a faster pace via less bit-by-bit instruction. Secondly, content is broken into two categories: *legacy*, or traditional curriculum, and *future*, i.e., technology, sociology, and ethics. Prensky suggests lessons be adapted to balance both types of content. Ultimately teachers have to determine how they can teach existing content in a new way and how to integrate the new learning of the "future" content.

Not only do digital natives and immigrants learn differently, but their brains are wired differently as well (Prensky, 2001b). Sousa (2006) supports the need for brain research in education, “Teachers try to change the human brain every day. The more they know about how it learns, the more successful they can be” (p. 3). Prensky (2001b) and Sousa (2006) discuss *neuroplasticity,* or the ability of the brain restructuring itself according to its inputs from their environment. In contrast to prior belief that our brain does not change after the age of three, this reorganization occurs continuously throughout life. Brain cells are constantly being replenished and influence our thinking. The way in which we think is a reflection on environmental experiences.

Twenty-First Century Skills

The Partnership for 21st Century Skills (2006) developed a framework for the 21st century classroom. They identified:

> six key elements of 21st century learning: [knowledge of] core subjects; 21st century content including global awareness, civil literacy, financial, economic, business and entrepreneurial literacy, and health and wellness awareness; learning and thinking skills i.e., critical-thinking, communication, collaboration; information and communications technology literacy; life skills i.e., leadership, ethics, people skills; and 21st century assessments. (pp. 10-11)

The Partnership believes that integrating these skills into the curriculum will make lessons more rigorous and better prepare students for the future in their educational careers and employment opportunities. Projects and assignments in the classroom need to involve more collaboration, demonstration of information, conversation, and a creation of a deeper understanding for content that will prepare students for the 21st century workplace; however, presentation-style and information-distributed projects currently in use within many classrooms may prepare students for jobs that follow rote skills (Solomon & Schrum, 2007). These are not the jobs that students will be pursuing.

The elements of 21st century learning mirror what potential employers are looking for in their new entrants. The Conference Board, Partnership for 21st Century Skills, Corporate Voices for Working Families, and Society for Human Resource Management (2006) conducted a report entitled *Are They Really Ready to Work? Employers' Perspectives on the Basic Knowledge and Applied Skills of New Entrants to the 21st Century U.S. Workforce.* The four organizations collaboratively surveyed more than 400 employers to identify the skills new entrants need in order to be successful in the workplace. They found that for students to be considered ready for the workforce, students need more than just basic knowledge in language arts, mathematics, science, and history. "Professionalism/work

ethic, oral and written communications, teamwork/collaboration, and critical thinking/problem solving" (p. 9) were the highest ranked skills employers were seeking. These *applied skills* were in more demand than basic content knowledge. J. Willard Marriot Jr., chairman and CEO of Marriott International, states:

> To succeed in today's workplace, young people need more than basic reading and math skills. They need substantial content knowledge and information technology skills; advanced thinking skills, flexibility to adapt to change; and interpersonal skills to succeed in multi-cultural cross-functional teams. (p. 24)

Unfortunately, too many students are leaving high school without these skills and experiences. Fletcher (2007) conducted interviews with several business people and concluded that problem-based learning is a possible solution. In problem-based learning, students apply content to real-world problems or experiences. Karen Bruett, director of K-12 business development for Dell Computer and one of Fletcher's interview participants, reminds teachers of the importance of effective instruction and cautions that they not use technology for technology's sake. She states, "Don't focus on the technology, focus on instruction and how the tools can be applied to gather and share information with a team trying to solve the problem" (p. 27).

Best Practices to Support Technology in the Classroom

Successful Integration for Teachers

Curriculum Implications: Technology and Constructivism

Education is not enhancing students' cognitive growth by treating them as passive learners (Sing, 1999). Karagiorgi and Symeou (2005) concur that learning and teaching are not synonymous. Teachers can teach well without having students learn. These researchers support a constructivist approach. Constructivism brings the world to the learner. The student imposes meaning to their world instead of "the meaning being imposed on the student" (Karagiorgi & Symeou, 2005, p. 18). Sing encourages an interactive learning environment that challenges the learner's mind by engaging in related, authentic tasks directly to the learner "without lowering the degree of cognitive complexity" (p.137). Students transition from the role of docile learners to critical co-investigators in the classroom (Freire, 2007/1970).

Sherman and Kurshan (2005) note a constructivist approach to learning when incorporating technology that can help students move beyond the "bells and whistles" and add value to student learning (p. 10). The researchers explain that learning is best enhanced when new content is connected to prior knowledge or experiences. They identify the following teaching characteristics of constructivism: using learner-centering and

interesting activities, focusing on real life, socializing, using active learning, providing time to learn, giving frequent feedback, and supporting or scaffolding learning.

Zemelman, Daniels, and Hyde (2005) classified best practice principles for teaching and learning that align with constructivism. The first cluster of best practices is student-centered and is comprised of experiential, holistic, authentic, and challenging activities. They suggest that students' questions should be investigated before learning arbitrary information. The classroom should find a balance between teacher led and student led instruction. Students should be engaged in hands-on activities that relate to their lives outside of the classroom and have meaningful opportunities for choice in their learning. The second cluster of best practices is cognitive and it entails reflective, constructivist, expressive, and developmental characteristics. Students are to construct their knowledge and lessons should be developed to increase higher order thinking skills. The last cluster is social and consists of collaborative and democratic goals. As a result, students may be engaged in small group activities to problem solve and receive feedback from their peers. Students will likely be required to make choices, and a community should be created in which students will have the opportunity to demonstrate and practice good citizenship.

Jensen (2005) identified the value of tapping into prior knowledge to help students retain new information. He states, “the best way to teach is to understand, respect, and build on the students’ prior knowledge” (p.45). If students are to bridge the gap between new information and old information, it is important to identify what their old bridge is. All students come into the classroom with prior knowledge and it influences learning. If their prior knowledge is inaccurate, it may cloud their understanding of new learning. Sousa (2006) also agrees with the value of prior knowledge and its influence on retention. He states, “the probability of storing information varies with the degree of sense and meaning that are present” (p. 49). When students identify the relevance of the content and it fits into what they already know, the information is likely to be stored and easily recalled. Students need to understand that learning does not occur “in isolation” or “water-tight compartment[s]”; in fact everything learned is interwoven (Dewey, 1997/1938).

Newmann, Bryk, and Nagaoka (2001) researched authentic intellectual work and the effects it had on standardized testing. The researchers asked, “What happens to students’ scores on standardized tests of basic skills when urban teachers in disadvantaged schools assign work that demands complex thinking and elaborated communication about issues important in students’ lives?” (p. 10). The three year study was

conducted at 19 Chicago elementary schools and consisted of over 5,000 students in grades three, six, and eight. Two teachers at each grade level and school building were asked to offer assignments that were categorized into two groups, typical and challenging, in the content areas of mathematics and writing. Four typical assignments and two challenging assignments were required for submission per year and more than 2,000 different assignments were collected. The summer following each of the school years, a group of teachers from other public Chicago schools rated the assignments according to the authenticity of the work. A second group of raters was brought in to control potential rater bias.

The researchers compared the students' test results on the Iowa Test of Basic Skills (ITBS), a nationally norm referenced assessment, along with the Illinois Goals Assessment Program (IGAP), a state administered test. The researchers found that students having the opportunity to complete more high-quality authentic intellectual assignments scored higher on these standardized tests than the national average, as estimated from the norming table documented by ITBS. For the ITBS in writing and mathematics, students exposed to high quality assignments had a 20% gain greater than the national average. In classrooms that had low quality assignments, students gained 25% less than the national average in reading and 22% percent less in

mathematics. Students with both high and low prior achievement levels who completed high quality assignments had greater gains on the ITBS than both high and low prior achievement students with low quality assignments. Researchers also found that low achieving students and high achieving students benefit from authentic intellectual work. Low achieving students made gains that were 29% higher in math on the ITBS when exposed to high quality assignments as compared to similar performing students with low-quality assignments. High achieving students who received high-quality assignments made gains that were17% higher on the ITBS than high achieving students who were exposed to lesser quality assignments. In reading on the ITBS, higher achieving students with quality assignments scored 42% above other students and lower achieving students with high quality assignments scored 28% above other students. Hence, the quality of assignments has the potential to make a significant difference in student achievement (Newmann et al., 2001).

Lunenburg (1998) provides additional evidence to suggest that a constructivist approach and effective use of technology also enhance student achievement. Students collaborate to create and develop their own meaning of new knowledge. Technology tools provide avenues for students to build upon this learning and make vital new connections.

Technology takes the constructivist classroom and provides opportunities for collaboration, communication and critical thinking to occur.

MPC/Gateway (2008) notes that integrating technology into the classroom may create a shift in current teaching practices, which may not always be welcomed by classroom teachers. Change can cause an awkward transition into new teaching strategies as well as the fear of the unknown. Bransford, Brown, and Cocking (2000) point out that putting a computer into the classroom will not automatically improve test scores. In fact, inappropriate use of technology, i.e., spending hours on font colors and styles, may indeed hinder learning. Technology should therefore be interwoven into students' daily activities to support collaboration and higher order thinking tasks (Niederhauser & Lindstrom, 2006).

Roles in a Technology Driven Classroom

McGhee and Kozma (2003) synthesized twelve case studies about the changing teacher and student roles in technology-enhanced classrooms. Many of the schools reported in this study "used technology to support project-based or inquiry-based learning" (p. 3). The researchers answered their question by examining interviews and observational data collected from six case study sites. Three new student roles were identified: *self-learner, team member, and knowledge manager*. In the role of "self-learner", students decided on their projects and found

solutions. They were responsible for organization and progression on their assignments. Time management and providing aid to peers in learning is an extension of this role. In the “team member” role, students were actively involved in their projects as a group to complete tasks. In some instances, the role was a specialized task a student needed to complete before moving onto the next step. The last role and most prevalent was “knowledge manager”. Students were required to formulate questions, research the information, analyze the data, and construct a product to demonstrate understanding. Most of the information they needed to gather related to a real world problem.

The second part of McGhee and Kozma’s (2003) research question is more complex. Teachers in the study maintained some of the traditional teaching roles (e.g. *class leader, lecturer, discussion leader*), and added six new roles: *instructional designer, trainer, collaborator, team coordinator, advisor*, and *monitoring and assessment specialist*. The *instructional designer* role, the most common, takes into account all the resources when designing, planning, and organizing lessons to differentiate to meet the needs of their students. The *trainer* models how to utilize technology and provides support to students when they try it. As a *collaborator*, teachers share strategies and lessons with colleagues or engage in team teaching. Some schools had department meetings to

collaborate on designing lessons. *Team coordinator* creates opportunities for students to work in heterogeneous pairs or groups and support them. The *enabling advisor* gives “assistance, advice, suggestions, or poses questions in a way that enable students to make sound decisions and find the information they need to complete a particular task” (p. 7). This role is synonymous with facilitator. As a *monitoring and assessment specialist*, teachers use assessment to adapt and guide instruction. They also provide feedback to the student on what needs to be improved. Researchers conclude that technology is changing classroom instruction.

Successful Integration for Coaches

Characteristics of an Effective Coaching Program

In order to have students achieve at a higher level, teachers must perform at a higher level (Killion & Harrison, 2005). The only way to ensure this happens is to have ongoing, high-quality professional development. An instructional coach fulfills this model. It is the coach’s responsibility to help teachers learn and apply new instructional strategies in the classroom and to be present in the teacher’s classrooms for a majority of the coach’s day. Killion and Harrison identify the following nine roles of coaching: “catalyst for change, classroom supporter, curriculum specialist, data coach, instructional specialist, learning facilitator, mentor, resources provider, and school leader” (p. 2).

Deussen, Coskie, Robinson, and Autio (2007) recognize that there is a significant “difference between being a coach and doing coaching” (p. 5). While there are many aspects of effective teacher coaching, working directly with teachers is the most likely facet to increase changes in teachers’ instructional practice (Steiner & Kowal, 2007). The less time spent in the classroom, the less impact coaches are likely to make.

Since coaching is a relatively new initiative, few studies have been done linking coaching and student achievement (Steiner & Kowal, 2007). The research on an effective professional development program provides guidelines to implement coaching. Research suggests that professional development be “focused on subject-manner content, aligned with other reform efforts, focused on how students learn academic content, and ongoing, rather than short-term, with opportunities for feedback and reflection” (p.3). Instructional coaches should be involved in school reform to align their strategies with the climate of the school. This will ensure that coaching is not seen as another thing to do, rather it supports the vision and mission of the school and district.

For administrators to implement a successful coaching program, they must acknowledge the need for coaching and believe in its effectiveness on professional development and its impact on teachers (Brown, Reumann-Moore, Hugh, Christman, Riffer, du Plessis, & Maluk,

2007). They also need to make resources available and sustain an organizational structure. Steiner and Kowal (2007) suggestions are to simplify the coaches' role, provide time in the day for reflection and discussion, and support the initiative. Administrators need to determine the goal of the school and how the coach will assist with the goal. The goal(s) should be consistent and include coaches' responsibilities and limitations. There needs to be a plan to schedule time for coaching. Observing teachers in the classroom is not a difficult task, but finding enough time to meet and reflect with teachers may be more challenging. A suggestion for time is to alter the school day with late arrivals or early dismissals. Teachers may be uneasy with being observed and judged. An administrator who offers clear support and demonstrates this support through words and actions provides teachers with encouragement and reassurance that coaching is imperative for success.

Characteristics of an Effective Coach

Knight (2004) referenced a four year study where researchers and staff developers from Kansas University Center for Research on Learning (KU-CRL) used an approach to staff development called The Pathways to Success project, which placed instructional coaches in six middle schools and three high schools in Topeka, Kansas. Knight (2004) calls an instructional coach, "an on-site professional developer" (p. 33) who is in

the classroom on a daily basis. He reminds us that there is more to coaching then applying research-based strategies into instruction; coaches are also “part anthropologist, advising teachers on how to contend with the challenges and opportunities they face while recognizing each school's unique culture” (p. 33).

A coach’s day is hardly ever the same as the day before (Deussen, Coskie, Robinson, and Autio, 2007; Knight, 2004). Knight (2004) offers seven procedures of what can make up a coach’s day. They are as follows: “meet with departments or teams, meet one-on-one with interested teachers, work on real content, model lessons in each teacher’s classroom, pay for teachers’ time, make it as easy as possible, and respond quickly to teacher requests” (p. 33-34). When the coach meets with the department, he or she explains the role of the coach and how coaches will help teachers implement research-based strategies. Teachers can offer feedback by identifying their personal interests. In the one-on-one meetings, the conversation is likely to be more focused with the discussion centering on how the teacher’s interests can be incorporated into the classroom and where it fits with the school’s initiatives already in place. The coach and the teacher can meet once or twice a week to then work on classroom relevant content. Here, discussions center on the application of the research. Lessons, units, and

assessments are developed for use in the classroom as soon as possible. Modeling lessons can help the teacher understand what researched-based practices look like in action. Teachers in the Topeka, Kansas project were offered payment for their participation, but Knight reports that most of them turned it down explaining that they felt appreciated knowing that their time was recognized as valuable. Knight discovered that the easier and more useful each teacher considered an intervention to be, the more likely teachers would implement it. Knight suggests that coaches provide materials needed for the lesson and assist in the transformation from research to practice, noting that teachers are likely to feel bogged down with many responsibilities. Coaches also need to provide immediate feedback and support for a smooth implementation of the new materials.

Over the four years of the study, Knight (2004) documented four important lessons that his team learned. The first is “to go slow to go fast” (p. 36). He suggests that coaches work to create meaningful relationships with teachers rather than worrying immediately about the end product and reaching all teachers. He notes that interventions are complex and once successes are made, word travels fast. Second, he suggests “focus on relationships” (p. 36). Build relationships with everyone in the school. Understand the teacher’s viewpoint and work load and when the right opportunity appears, offer suggestions. Coaches should not overwhelm

the teachers. Rapport and trust are the foundation of coaching (Learning Point Associates, 2004). The teacher and coach need a strong professional relationship to create a safe learning environment to take risks and make mistakes.

“Have a partnership mind-set” (p. 36) is the third lesson (Knight, 2004). The coach should see himself or herself as an equal to the teacher and gain as much information collaborating with teacher as the teacher gains from the coach. A coach that acts as an expert may hinder the experience. Lastly, “offer teacher choices” (p. 36). When teachers are given choices to implement something new, they are more likely to have ownership and fidelity.

Brown, Reumann-Moore, Hugh, Christman, Riffer, du Plessis, and Maluk (2007) analyzed research findings from the Pennsylvania High School Coaching Initiative (PAHSCI). PAHSCI is a three year coaching initiative through Research for Action. Its mission is to improve student success rates in high schools throughout Pennsylvania by improving teacher’s literacy skills across all content areas. PAHSCI’s design “relies on instructional coaching, professional development, and mentoring, and the Penn Literacy Network’s (PLN) framework to yield both intermediate and, over time, long term positive outcomes” (p. 5).

Brown, et al. (2007) reported on the first two years findings of PAHSCI and found four indicators leading teacher's implementation of PLN's researched-based instructional strategies. The first was teacher's attendance at a PLN professional development with follow-up support and encouragement from the instructional coach. This enhances teacher's understanding of the professional development and ensures fidelity. When challenges occurred in first time implementing the strategy, the coach was there to get past the initial hurdles and customize the strategy to suite the teacher's needs. These benefits led into the second indicator, working one-on-one with the instructional coach.

The third indicator in teacher's implementation of PLN's researched-based instructional strategies was when the coach had a clear understanding of their role and had a strong professional identity. The last indicator was the use of the "before-during-after consultation cycle" (Brown et al., 2007, p. 25). The 'before' part of this cycle is when the coach meets with the teacher to plan the lesson. 'During' phase involves the coach visiting the classroom and observing lessons, learning environment, students, and, if needed, co-teach. In the 'after' phase, the coach will meet with the teacher to debrief on the lesson and reflect.

Conclusion

The expectations of students to continue successfully after high school have changed. Higher education and employers demand students to not only know their basic reading, writing, and mathematics skills, but also have the capabilities to collaborate, problem-solve, and communicate efficiently. The pedagogy of K-12 teaching needs to be reexamined. The constructivist approach and integrating technology tools are imperative ingredients to enhance student achievement. Coaches act as a change agents in the classroom to accomplish these goals.

METHODOLOGY

Introduction

Higher education institutions and the workplace are demanding more from students than simply content area knowledge. Technology and 21st century skills, for example, collaborating, critical thinking, and problem-solving, need to be interwoven into lessons. My role as a coach was to work with teachers to integrate technology and 21st century skills into their classroom.

Setting

My study was conducted at a suburban high school in eastern Pennsylvania. There are 1500 students throughout grades 10 through 12. The demographics of the students are 15% Latino, 70% White, 20% Black, 5% Asian, and 0.2% Native American. The school has an Individual Education Program subgroup and Economically Disadvantaged subgroup. During the study, the school was undergoing renovations. To accommodate the large population during the renovation, five modulars, with two classrooms in each, were located outside the square brick building. Each class period is 42 minutes long; the school year is broken into four semesters.

Shortly before my study began, the school received a technology grant from the Pennsylvania Department of Education. This technology

grant provided funds for an interactive whiteboard, LCD projector, and a laptop cart to be placed in each core content area classroom. Along with equipment, money was provided to the school to hire a technology coach. Teachers were also required to complete an online course about incorporating technology in the classroom that related to their content area. The teachers and their respective classrooms that were involved in my study were part of this grant.

Participants

My study had participants with different levels of involvement. There are two participants that fully engaged in all aspects of my study. They were two Caucasian female teachers in their late 40s. They volunteered to be in the study and both teach English. One is a Special Education teacher and the other is a general education teacher. Their years of teaching experience are 15 and 22. They both have obtained Master's degrees; one teacher is currently taking graduate classes to pursue certification to teach English Language Learners. They participate in activities beyond the school day, for example, the after-school Pennsylvania System of State Assessment (PSSA) program, which is designed to provide support for students who did not score well on the PSSA. These teachers provide remediation for these students in their reading and writing. Many students that score proficient on the PSSA

come to the after school program because they enjoy working with these two teachers.

These two teachers were involved in the third year of the technology grant. Their levels of technology expertise vary. One teacher is very comfortable with integrating technology and the other is not as tech-savvy. I had worked with both of these teachers prior to the study.

Another participant in my study was the director of technology and computer sciences. He is a white Caucasian male in his late 50s. He has been in education over 30 years and achieved his doctorate in education.

The other participants that were involved in my study, but did not fully complete the study were four white Caucasian females and two Caucasian males. The content areas they teach are math, English, science, and English as a Second Language. Four out of six of these teachers have obtained their Master's degree or Master's Equivalency. Their teaching experience ranges from 6 to 25 years and ages range from mid 20s to late 50s. Five of the teachers were involved in the technology grant for three years and the other teacher has been involved for two years.

Design of Research

The most challenging part of the study was to find participants. I was an outside person and did not have a relationship with some of the

teachers. The year I conducted my study was when I became a full-time coach. In the previous year, I had worked with the district two days a week from December to June. I met and asked teachers that I worked with the year prior if they wanted to be in the study. Two of them accepted.

In the rest of the document, I will be referencing meetings and conversations with the teachers. It is important to note that no time outside the school day was utilized for these meetings and discussions. All of them occurred either immediately after the lesson or during the teacher's 42 minute planning period.

To introduce the study, I met individually with each teacher. During this initial meeting, I informed them that the study was approved by the Human Subjects Internal Review Board (Appendix A) and by the principal (Appendix B). I wanted them to know that the principal agreed with the conduct of the study in case they needed to talk to him about it. We discussed in detail the procedures that they would be encountering and the roles each of us would be involved in. They each signed a participant consent form (Appendix C). This is the first time the teachers were given the opportunity to work with an instructional coach and this was my first time as a full-time coach. They completed a pre-survey (Appendix D) about their teaching and technology experiences.

In the next meeting, we talked about lessons that these two teachers would like to integrate with technology. Goals and objectives had to be identified before we would start planning. I did not want to lose sight of those important pieces of the lesson. We then began planning how to implement technology. The teachers were the content experts and I acted as the technology facilitator. I made sure the websites that we used were unblocked, and that the projects were aligned to our Acceptable Use Policy, had administrative approval, and provided support and professional development.

When it came time to implement the lesson, the teacher would instruct the students on the content and I would show them how to use the technology. It was a co-teaching experience. The teacher and I interacted with the students as a team. Afterwards, we debriefed about the lesson and any adjustments we would need to make for the next day. These conversations took place during the four-minute transition time students had in order to get to their next class. If we found we still needed time to reflect, we would meet during the teacher's planning period.

Data Collection

In order to triangulate my data, I utilized many different forms of data. Data were comprised of surveys, meetings, checklists, interviews,

coach log, and field log. Each component awarded me more insight into pieces of the puzzle in answering my research question.

Pre and Post Survey

During the first meeting, each teacher completed the pre-survey (Appendix D). They had to answer questions that required them to reflect upon their current classroom practice. They rated themselves on a five-point scale. Below each statement, they listed the kinds of technology in their classroom and how each is used. This gave me an indication of the teacher's teaching strategies and their level of technology use. This information acted as my baseline data. I gave them the same survey (Appendix D) at the end of the study to see if their teaching practice and/or technology implementation had changed.

Teacher Meetings

Meeting with teachers became a large component of my study. As stated earlier, some meetings occurred after the lesson for four minutes or they were during the teacher's 42-minute planning period; no time outside the regular school day was used. The meetings served the purpose to reflect upon the lesson that was taught that day. We used this information to plan accordingly for the following day. Typically, the meetings were daily occurrences.

Lesson Observation Checklist

During the lesson, I completed a lesson observation checklist (Appendix E). This form was used to align classroom practice toward the constructivist model and effective integration of technology. I marked either a zero or one depending if the criteria were met. I recorded specific observations or notes that I saw demonstrated in the classroom. The teacher and I discussed this form during a teacher meeting, along with the completed teacher lesson reflection form.

Teacher Lesson Reflection Form

The teacher also completed a teacher lesson reflection form (Appendix F) reflecting on the lesson. The teacher lesson reflection form served as a way for the teacher to assess if their classroom was constructive and how technology was used. There were questions regarding: the most valuable part of the lesson and what, if anything, they would improve, and how the technology and constructivist approach has affected their students. We met to compare both of our forms to debrief upon the experience.

Interviews

At the end of the study, I interviewed each teacher about the integration of technology in their classroom and the coaching process. Instead of using questions, I gave the teachers prompts (Appendix G) that

they had to respond to. The prompts provided the teachers with the ability to expand upon their answers as opposed to answering “yes” or “no”. The interview gave them an opportunity to express the experiences in their words. It allowed me to fully gain an understanding of what they liked, why they liked it, and what could be improved upon. This information guided me on how to efficiently continue coaching.

Coach Log

A requirement of the technology grant was coaches were required to maintain a daily web-based log. It is designed for coaches to track their data and self reflect on their coaching practice. Every day, I documented my activities and interactions with the teachers. Periodically, Pennsylvania Department of Education would log on to gather data on how schools are utilizing their coaches. I received an email thanking me for keeping my coach’s log up to date.

Field Log

During the entire study, I kept a field log. In the field log, I recorded observations that I saw in the classroom, dialogue during teacher meetings, and informal conversations with the teachers. The field log enabled me to accurately record and debrief on the experiences during the study. In order to distinguish between observations and my thoughts, I

broke down my log into two columns. In the left column, I wrote the observations, and in the right, I listed my comments.

Trustworthiness Statement

In order to fully ensure trustworthiness of my study, a few guidelines had to be met. First, my study proposal was approved by The Moravian College Human Subjects Internal Review Board. Next, the principal of the school building and teacher participants received a consent form. Hendricks (2006) outlined the essential components that comprised a consent form. The consent form explained the need for the study, that participation in the study would occur during school hours, that confidentiality would be maintained, and that participation was completely voluntary. Any teacher who wished to withdraw from the study may do so without any penalty.

The data that were recorded was kept and coded in a password protected computer and a locked filing cabinet. I was the only one who had access to these materials. All recordings used pseudonyms to protect the participants' identity, and they were stored in a password protected computer. The key for the pseudonyms was also kept in the password protected computer. At the end of the study, all data was properly destroyed.

To be certain my study was credible, triangulation was applied (Hendricks, 2006). Triangulation ensures the credibility of research by gathering “multiple forms of data to answer your research questions” (p. 73). I collected data from observations, interview questions, lesson checklist, teacher surveys, and teacher reflections. I kept a daily log that recorded observations and thoughts I had.

MacLean and Mohr (1999) recognized the importance to acknowledge biases and keep them in mind while conducting the study. During my study, I realized I had three biases that I needed to address. The first is that I believe in professional development and its impact on learning. Collaborating with teachers provides an opportunity to expand knowledge and brainstorm effective teaching strategies. I had to understand that not everyone would appreciate the value of collaboration. I respected their choices and did not pressure participants to join in these activities.

The second bias stems from my pedagogy. I am a constructivist teacher at heart. An ideal classroom for me has collaboration amongst students and application of content to real-world experiences. Technology is a great tool to connect learning to life outside the classroom. This leads me to my third bias, technology. I believe that students need to be engage in activities related to technology at least once a week. As teachers, we

are responsible for teaching students to be prepared for the day they leave high school. Higher education institutions and employers are demanding students to have, at minimum, basic working knowledge of technology. Our students need to be equipped with these skills to compete in society. I recorded my feelings on professional development, constructivism, and technology in a separate column of my log. I did this to make sure I kept factual information from my beliefs and opinions.

Weekly, I met with my professor and teacher researcher support group to allow me to debrief on my findings. They encouraged me and offered suggestions about my study.

Summary

In order to ensure a credible research study, I have adhered to the following recommended guidelines. The first is I obtained approval from Moravian College's HSIRB. After I thoroughly explained the study to the participants, they and the principal signed a consent form. During the study, triangulation was in place. I collected data from surveys, checklists, interviews, meeting, and field log. All of the data were coded and kept in a safe locked place to which I only had access. I identified my biases and kept my beliefs in a separate column of my field log. My teacher research support group helped me with suggestions to my study and made sure everything I was doing was ethical.

THIS YEAR'S STORY

Rocky Start

The start of this school year was going to be a whole new experience for me. Last year, I was a part-time staff developer at an Intermediate Unit and a part-time CFF instructional technology coach at a high school. Needless to say, my schedule was very busy. I felt that juggling these two positions was greatly affecting the teachers that I coached. I did not have a set schedule so they never knew when I would be in the district and could not depend on me to be there every step of the way when they implemented technology. This would sometimes hinder their enthusiasm to try integrating technology. After meeting with administration and learning that grant money was renewed, I was assigned to work at the high school as a full time CFF instructional technology coach for the 2008-2009 school year.

I was very eager to coach at the high school full time. I would be able to devote all of my time to the teachers to incorporate technology. The first few days of coming back from summer break were very slow for me. I expected this as teachers would be welcoming their students back and getting to know them. During this time, my main purpose was to ensure that the teachers' interactive whiteboard and computer were hooked up properly. Few teachers were calling to integrate technology.

After two weeks, I passed Melissa, a math teacher and department head, in the hallway. She and I worked together last year by showing her how to use her interactive whiteboard with the math curriculum. When I asked her if she wanted to collaborate together to integrate more technology into the classroom, like using podcasts, her response was “Heather, I would love to do that. I only have forty-two minutes with these students. I have to cover this entire curriculum in that short amount of time.” The term coverage did not sit well with me. Freire (2007/1970) warns us of the danger of coverage by stating “it turns them [students] into ‘containers’, into ‘receptacles’, to be filled by the teacher. The more completely she fills the receptacles, the better a teacher she is” (p. 72). I was concerned that this was how other teachers felt. Coverage and comprehension are not synonymous with each other.

September continued with some more technical questions about the equipment in the teachers’ classrooms. Renee, an English teacher, had emailed me about incorporating a video into her Power Point. I had never worked with Renee before and was excited to have this opportunity. During her planning period, I took her through the steps to add the video. After we finished, I probed about her lesson that she was teaching to the students. She said it was about *The Crucible*. I showed her some other videos and lesson ideas that she could use with her students. I said, “I can

work with you one-on-one and we can brainstorm some more ideas when you have time." Her response was "I'm ok for now." The response, "I'm ok for now", came up in quite a few more conversations I had with different teachers. What were the reasons behind this statement? Was it time? Standardized testing? Fear of technology? Are they accustomed to working alone and felt like they would burden me? I was beginning to hear the phrase "I'm ok for now" in my sleep.

Readjustment

My year was not going exactly how I thought it was going to be. I imagined this year collaborating with teachers to plan lessons. I did not want to pressure the teachers into something they were not ready to do. The purpose of my study was to observe findings that occurred when teachers work with a coach to utilize technology in their classroom. My study was designed to meet the teachers at their comfort level with technology and progress forward. I had to tweak my study to adjust to the teachers' comfort levels, interests, and motivation.

I decided I would work with teachers who wanted help. I felt that if I worked closely with a handful of teachers and gained their trust, word would spread encouraging other teachers to work with me.

Professional Development

Co-Planning

I was informed by administration I would be conducting their professional development in mid-October. In the morning, I would be working with the English department and the afternoon I would be with the math department. The topic was on how to use the interactive whiteboard in their respective content area. I remembered Delpit and Dowdy (2002) saying, “The journals, teaching magazines, workshops, institutes, and conferences all provide resources for ‘what’ to teach. The major stumbling block is how to make use of those resources in local, specific classroom contexts” (p. 119), and I decided I wanted to meet with the head of each department. Teachers can read broad ideas about new instructional strategies and technology applications, but it is most helpful when these strategies and resources directly relate to their current teaching situation. The department heads would be able to provide me with this essential background information.

Melissa was the math department head. When I showed her my agenda, she stated, “We are more advanced than this. Maybe we can have a question and answer session?” I agreed and felt very happy that I had this opportunity to meet with Melissa. She provided such great feedback that if I would have presented the professional development the

way I planned, the teachers would have been bored. I would provide the math department with a staff development that fits their needs.

Jim was the head of the English department. We met and discussed the comfort level his department had with regard to the interactive whiteboard. He stated, “They are going to need a lot of hands-on work. Some people’s abilities with the whiteboard are low and others are in the middle. If you can gear it towards that, then the teachers will gain the most.” I liked the idea of hands-on learning. I called the main office to schedule rooms that had an interactive whiteboard so teachers would be able to work together. With the valuable information provided by both department heads, I felt confident that I would be providing staff development relevant to the teachers.

A Nice Surprise

The next day, I was feeling relieved after meeting with the department heads. I began planning the professional development with their tips in mind. As I was planning, Martha, a special education teacher, stopped in the library. We had collaborated together on a few projects in the past. She was going to school for her certification in instructional technology. She had said that she enjoys “picking my brain” about technology applications and what she was learning. Today, she said something that caught me off guard. She said, “I was just thinking the

other day that I am really glad you are here full time. I feel safe trying things knowing that you are right in the library if anything goes wrong." I was very shocked by this and completely honored that she shared this with me. The first step to an effective coach is developing a trusting, respectful relationship. Martha and I had created this type of relationship. I was hoping to move all teachers in this direction. I was happy taking it slow and moving teachers one by one. Word travels quickly in schools.

Presentation Day

It was the middle of October and time to present the professional development I had planned with input from the department heads. In the morning session, I met with the English department. I decided to break the two and a half hour session into 20 minutes of direct instruction and 10 minutes to "play" with the board and try the tools I taught them. Vygotsky (1978) reminds us about the importance of play. Play is not an "activity without purpose" (p. 103). In this instance, play was a synonym for explore. I was providing teachers with time, something they have so little of, to explore the tool and become more familiar and confident with using it.

For me this was a great experience. Before I became the instructional technology coach, I was a staff developer. I had provided staff development for 13 school districts ranging in grades kindergarten to

twelfth. This was the first time that I fully knew the teachers in my audience. I knew which ones would be the resisters and which ones are willing to try. I knew the content they were teaching and the initiatives they were involved in. I knew what the principal had expected from them and the climate of the school. On the flip side, the teachers knew me. They knew who I was and the capabilities I had. Most importantly, they knew I knew them. We seemed to have built a trusting relationship, which Knight (2007) believes is critical for coaching to be successful. They would ask me questions and I would respond by using their names. I also knew the questions I needed to ask to really target their problem. They knew that if they needed follow-up with the professional development that I would be in the library to help them. The true sign that told me the session was going well was that no teacher was grading papers. Everyone was focused on learning.

As I was instructing the teachers on the interactive whiteboard, they were asking me questions. Twenty minutes had gone by and it was time to split up into groups for the teachers to work together with the board. As I circulated around the rooms, I saw Renee in one of the groups. I asked her if she had an opportunity to look at some of *The Crucible* resources that I showed her in September. She replied, “I would like to do more of what you showed me, but there is no time to explore. But today is

excellent. It is very helpful to have the booklet you provided and then practice on our own. This is what we should be doing in professional development. I feel that I will go back to my classroom and use some of this stuff." This was not exactly what I wanted to hear about *The Crucible* resources. I began to wonder how in a month's time she was unable to find a half-hour to go over the resources.

The comments Renee made toward the professional development was the general consensus of the day. The teachers found the experience working together at the board extremely beneficial as they were able to brainstorm with other teachers teaching the same content and also able to learn how other teachers were using the board in their classrooms. They felt the professional development was geared directly to them and their time was useful.

The math session went as smoothly as the English session. The math teachers were more confident with the board so they did not need the time to "play". They came to the professional development with questions ready to ask me. "How can the board insert objects?" "Can the board do this?" It was completely different then what I had planned so I was pleased to have the opportunity to meet with the teachers to co-plan. It was one of the first sessions that I immediately knew was what the teachers wanted.

Two Teachers

Ann's Journey

How exciting! My room is full with all this new technology! I have a laptop for each of my students to do research and a Promethean board to interact with my students. I wonder what else I can do with this equipment. I love learning technology and use it frequently at home and as much as I can in school. I am sure there is a good deal more I can learn. We have a technology coach available in the school building every day. I'm sure I can learn a lot from her.

Figure 1. Ann's Vignette

Our first meeting. Ann's journey began in the beginning of October. Teachers were wrapping up their first round of 4sight testing. I went to visit Ann, an English teacher that I had not worked with, but knew enjoyed using technology in her lessons through conversations she and I had in the hallway. I explained my study to her. She agreed to be part of the study and signed the consent form (Appendix C). Then, I asked her to fill out the pre-survey to act as a baseline about her classroom and technology skills (Appendix D). As I suspected, her survey indicated that she was fairly comfortable using technology; she rated the statements with mostly four out of five.

During this meeting, we discussed her upcoming project consisting of students researching a controversial issue, such as, corporal punishment, school vouchers, school violence, gender issues, or school prayer. Each student was required to demonstrate the information of their topic in a multimedia presentation. I asked, “How will the students be getting the information?” She said, “Googling it”. I suggested using a more reliable search engine, such as netTrekker. She thought it was a great idea, but was not familiar with how to use it. I told her that I could show the students and her how it could be used. She said that next week her students would be ready to begin their research. I went into her classroom and showed the students netTrekker and its capabilities.

Better than just “Googling” it. It was time to begin teaching Ann’s students how to use netTrekker for their research projects on their assigned controversial issue. To start the lesson, Ann introduced me to her students: “This is Miss Brown and she is here to help us with our projects. She is our technology coach so she is helping me learn how to use the equipment to teach you guys. Today, she is going to show us netTrekker. Please get out your laptops and listen to Miss Brown.”

I instructed the students to open Internet Explorer and go to the netTrekker website. As I showed the students the site, Ann interjected comments, like “Oh this is so cool.” “You guys are really going to need this

when you do your research. This is really important to know." It was helpful to have her express to her students that what I showed them was very important. By her making these comments, it helped the students to understand how they would be using it. I did the same lesson for two periods. I showed the students how to use the site, and she made the connections to their research project.

After I showed the students the site, Ann and I walked around to guide students on the site and helped them to find information on their research. If the students had any questions, Ann and I answered them. Since she was not familiar with netTrekker, I answered most of those questions. The bell rang, and Ann thanked me for helping her students. She said, "I think this will give them much more credible information than having them Google. Thank you so much for your help."

The following week, I would be at a professional development conference for coaching. I told Ann if she needed anything to email me. She said she would and "I'm looking forward to working with you when you get back."

Working with videos. By the time I returned from the conference, it was the end of October. I stopped in Ann's room to hear how the project had been going. She said that her students were using the site well and were now looking for videos on their topic. She said, "I want something better

for my students to use than youtube. Some of it is good, but some of it is garbage. I showed them United Streaming. Are there any other good videos sites that you know of?" "Ann, off the top of my head, I am not sure of any. Let me do some research and I will get back to you. Other than that, is there anything else I can help you with?" "Yeah. Can you show them how to embed a video in the Power Point?" I assured Ann that I could and would look for more video sites her students could use.

I was very happy that Ann showed her students the resource United Streaming. Not too many teachers were aware of this educational site. My next task would be finding more video sites like this one. My first step was to contact the coaching list serv. Classrooms For the Future developed an email list serv for coaches across the state to share resources and ask questions about experiences in their district. The collaboration and resources gained from this list serv is phenomenal. When one of us experiences a problem in our school, coaches are there to provide support and guidance on how they handle difficult situations. I sent an email asking for more video sites and received immediate responses of sites, for example, www.icue.com and www.researchchannel.org.

Once I received these resources, I went to Ann's room. She added them to her list of sites for the students. Later in the day, she told me, "My students are loving the sites and finding great information."

Later in the week, I was scheduled in Ann's classroom to show her students how to embed the videos they found from these sites into their Power Points. On that day, Ann was out sick. She left notes in her sub lesson plan for me to instruct her students about importing videos. The sub was comfortable enough to allow me to show the students this process. As I was demonstrating, a student asked me how they could crop videos. Some videos they found were 10 minutes long and only three minutes of the video directly related to their topic. I said, "We can use Movie Maker to crop videos. I haven't worked with this software in some time, but I know it can be done. Let me play with it and I will talk to your teacher about it." I was very happy that a student asked me a question. The more I was in the classroom helping students, the more I felt like a part of their classroom and not a visitor. Coaches act not only as resources for teachers, but also for the students as well.

The morning Ann returned, I shared with her the question her student had regarding cropping a video. She said that was a question that came up before and she was not sure of the answer. She would like me to demonstrate to her students how to crop a video. We thought the next day

would be a better time so she could meet with her students that same day and determine how far along their projects were. I agreed and told her I would be available tomorrow to show the students. Meanwhile, I spent much of the day working on Movie Maker and refreshing my memory on how to use it.

It was a brisk end of October morning when I worked with the students to edit their videos. I took the students through the steps of editing video clips using Movie Maker. Ann and I thought it would be best if the students watched how it is done before they tried it on their laptops. Ann commented, “Wow! This is so much easier than I thought.” This comment made me wonder if other teachers would try some of the technology and have me help them learn, they would realize that some of it is not that difficult to operate. I was hoping that Ann would share the ease of technology with people in her department, sparking some interest.

We continued to work as a team in the classroom. While I demonstrated Movie Maker, Ann asked me questions that some of her students might have been thinking, but were too shy to ask. She structured these questions directly to the project requirements that her students were working on. Ann then prompted the students to get out their laptops and begin research and edit their videos. As we circulated, we discovered a glitch. Movie Maker was not on the student laptops. The

technology department had taken it off the student laptops. After class was over, Ann and I met to discuss what happened. She said, “We are excited to do all this stuff with technology, but they [technology department] make it so difficult. It’s frustrating to go to do something and realize they have removed it for no reason.” I told her: “I’m just as puzzled why they would take it off since it’s a free program. I will email technology to find out if we can put it back on. How do you think the lesson is going?” She said, “I think the kids are getting into it ‘cause it’s their own project and personalized. I love learning this stuff. I am having so much fun that I can’t wait to use it with my personal stuff!” I hoped that she would share this enthusiasm with other teachers in the school.

I emailed the technology department regarding the installation of Movie Maker on the student laptops. They responded by saying it would take some time before they could reinstall the program on the student laptops. Ann did not want to wait because she wanted the project done in a week to move onto the next topic. We found that the program was installed on the teacher’s desktop computer. Students had the option to edit their movies at home or they could work on editing from the teacher’s computer during class. Ann and I continued to help the students with their project until it was time for them to present.

Reflecting on the project. Ann's lesson was very hands-on and followed the guidelines of a constructivist model. The issues the students researched were relevant to their life; they were engaged in higher order thinking; and they collaborated with their peers to create the final project. Ann noted on her teacher lesson reflection form (Appendix F) that she felt the students' most valuable part of the lesson was the ability to differentiate between essential and non-essential information. This was one of her main objectives for the lesson. It was important not to lose sight of the objectives when integrating technology. It was very easy to be distracted by the "bells and whistles" of technology and veer onto a separate, misguided path. She liked that her students were in complete control of their projects. The students decided which information was significant and created a presentation to demonstrate what they had learned. She will continue to use this project in the future.

Ben Franklin on MySpace. Ann and I met during her study hall to plan another project. She was not sure what project she wanted her students to do next. I suggested that she think of her class periods and the topics she would be teaching. In her 11th grade class, they were to begin reading Macbeth. She was very excited about teaching this to her students and already had ideas and activities to engage her students. Then, a look of disgust came across her face as she was thinking of her 10th grade class.

Rolling her eyes, she said, “10th graders will be studying famous authors like Patrick Henry and Ben Franklin. I really don’t like teaching that part.” I said, “Great. Let’s start with something you aren’t too fond of teaching and make it something exciting.” Ann mentioned, “I’ve seen another teacher use a MySpace layout in a Word document. I would like to do something like that. This is something that the kids already know and will be interested in doing. I don’t like the format in Word though. It seems rigid.” I was sure that there had to be a web-based program students could use. I told Ann I would do some research and come back to her with ideas.

I knew of some sites that would be perfect for this. Unfortunately, this task went deeper than just finding a site. It must be a free, educationally appropriate site for students to use. It had to be secure, and privacy of the students was very important. Most of all, it had to be a site that was not blocked by the school’s filter; that was going to be the most challenging part. As I had done with finding more video sites, I turned to the coach’s list serv for ideas. One site that was secure, educational, free, and unblocked was www.notaland.com. I went to Ann’s room and showed her what I had found. She was very pleased and said, “This is great. It will be fun for the students to learn about the authors this way.” This was a nice change. When we spoke about the lesson earlier, she rolled her

eyes and was not thrilled to be teaching it. Now she was describing her lesson as “fun”.

Prior to teaching the students how to use Notaland, they had to finish the content they were currently learning. She also wanted them to go to the library and research authors. Because of these reasons, I would not be in her classroom for about two weeks. This provided me with the opportunity to create my own page in Notaland in order to learn all the features. I also created accounts for all of the students. Doing this kind of prep work before we started helped the project to run smoothly.

High-Five for literature. Thanksgiving was over and it was the beginning of December. The student accounts had been set up and I had an opportunity to learn the Notaland tools. I went to Ann’s classroom to see how her class was progressing. This week her students were going to the library to research the authors. The following week was when I would be teaching her students Notaland.

Ann also told me that she shared the Notaland project with her sister. Ann’s sister is a chemistry teacher in Virginia. After Ann explained the project to her sister, she became excited and thought of ways that her students could use it in her classroom. One idea was to have students create pages about an element illustrating who they would be attracted to

and a description of their properties. Collaboration among teachers is the best way to share ideas and new ways of thinking.

Ann shared with me that when she told her students they would be creating a MySpace page of their American author, the student's reactions were "priceless". She said that they were confused, but very excited to do this project. Two of her students high-fived each other after she told them. I wondered if this was their reaction because this project was designed so they could express themselves creatively. How many times do students high-five when they have to write a paper? It seems like creating a MySpace page would be "easier" but in fact, the students were still required to research information. It was just a different type of product they created.

Ann and I met before I taught her students how to use the site and we decided to show them some features and allowed them the rest of the time to play with it. Ann's reason was: "This is what they are growing up with and how they communicate. This will relate to them and I think they will run with it." When I showed her students how to use the site, I experienced the same reactions as Ann. They commented on how "awesome" it was and they wanted to use it for their own personal use. As I showed them, the students were already adding content and formatting their pages. Ann was right; they "took off" with it.

Over the next few days, I supported Ann and her students with the site offering help and “how tos”. As the winter season was setting in, so were the snow days and delays. Unfortunately, my research ended before the students presented their pages. Ann was very pleased with the progression she was seeing and was already thinking of other ways she could have her students use this site. One thought she had was having the students create a MySpace page for each character in Hamlet. She commented, “What a great way for character analysis.”

Pam’s Journey

Oh man. There is so much technology stuff in here that I have no idea where to start. I see that each student will have a laptop, which could be good although I am not quite sure how to use them. What the heck is this Promethean thing? Ok Pam, take a deep breath. This could end up being good for your students. Yeah, they live in a world of technology and maybe this will help to hook them and express themselves. Maybe I should contact the coach lady from last year. She was helpful. Maybe she’ll have a clue of where I should start ‘cause I sure don’t!

Figure 2. Pam’s Vignette

The new beginning. The second teacher in my study was Pam, a special education teacher. Pam and I have an interesting history together. When I

was a part-time coach last year, Pam made it clear that she was not excited about technology. She would repeatedly say, “I’ll never learn how to use this stuff.” Oddly enough, one day last year I found myself talking to her in the library. She said she was interested in trying something new with her students. We decided to have the students create podcasts. By the end of this experience, she was astonished by the projects her students created. Now she is a believer in technology. She was not fluent with technology, but with support from a coach, she was willing to try.

I had explained to her the premise of my study and she agreed to participate. In our initial meeting, she signed the consent form (Appendix C) and completed the pre-survey (Appendix D). As she was completing the preliminary survey, she said, “I don’t know how to do any technology. I think I will be a ‘3’ for all of these.” I reassured her that that was perfectly fine and we could use this survey to chart her progress.

We continued to discuss her upcoming lessons. She was currently teaching her students persuasive writing, then to be followed by narrative writing. I suggested taking a break between writings and having the students create a digital autobiography. They could use this to structure their writing for the narrative piece. She said she loved this idea.

Digital storytelling. We began the first project in Mid-October. We were going to be using Photo Story software for students to create their digital

autobiographies. I went to her classroom to show her students the process for designing their autobiographies. I demonstrated how the students could import pictures into Photo Story and how to add effects to the pictures. Then I showed them how to write text on their pictures and add music to their projects. Pam interjected comments that related to the content of the projects the students would be creating. After I showed the students the software, Pam and I gave the students time to play with it to understand its capabilities and gain some ideas. Pam told her students that tomorrow they would be importing their pictures. It was suggested that they bring in pictures from home or take some images off the Internet.

The next day, students were importing their pictures into their projects. As Pam and I circulated around the room, we found that most of the students were taking current pictures from their MySpace page and not using any pictures from their childhood. I felt that one reason this happened could be because she did not provide them with a rubric or template for the project. When I suggested giving them one, she commented, “I want them to come up with as many pictures as they can and then we can narrow the focus from there.”

To help students understand what pictures they should be adding to their project, Pam defined what an autobiography is by relating it to a project her son had to complete when he was in grade school. She said,

“My son had to a similar assignment like we are doing. He had to write a letter for his 6th grade graduation project. We collected pictures of him when he was a baby, pictures of sports that he was involved in, and what his future plans were when he graduated high school. Years have gone by and we forgot about it. Close to his high school graduation day, his 6th grade teacher mailed the letters to her students. It was neat to see his thoughts from 6th grade and what he was currently interested in. So that is what I am hoping this project will be for you, a type of diary of your education career to this point and your future goals.” I thought her defining an autobiography in this way by telling this story gave the students some guidance to what they need to be doing. A technology question arose from one of the students about importing pictures and Pam said, “Ask Ms. Brown. She knows all about technology.”

When the bell rang and the students left, we briefly debriefed on the lesson. I told her, “It was good you guided them to what the final project should look like and what they need to do. They were taking pictures of themselves now and missing the point.” She said, “Yeah. I told them this before. Maybe we should show them an example or give them some notes on the project.” I told her I have some student examples from last year we could show. We agreed to do that first thing the next class.

I thought about showing the students examples before the lesson had started. I wanted to guide Pam and have her come to this realization on her own. As a coach, I collaborate with teachers on best practices. I do not tell them what to do. Instead, we work together as a team to decide what is best for the students (Knight, 2007).

The next day did indeed prove to be better. First, we showed the students examples of what their peers created last year. By showing these examples, the students asked more specific questions about the project. I thought that since the students saw what their peers had done, it would have provided them with more ideas for their project. Some of her students brought pictures in from when they were young. Pam's classroom did not have a scanner. These students and I had to go to the library to scan pictures into their student drive. By doing this, they would be able to access this drive from any classroom and computer in the school.

A week had gone by, and Pam started the class by meeting with the whole group. She discussed in more detail the requirements for the students. She decided that she wanted a total of 16 pictures from four phases of their life: baby, teen, high school, and future. Each phase must have at least four pictures. For the future phrase, students could use symbols or pictures of what they wanted to accomplish in the next five to

ten years. She reminded them that they would be adding text, picture effects, and music to their project.

After the lesson, I told her that providing the students with more direction was a great idea. She said, “I didn’t want to limit their creativity by enforcing restrictions or guidelines.” I assured her, “This will not limit their creativity. In fact, you may have expanded upon their original thoughts by supplying them the guidelines. Some students work better with structure. You made the expectations more clear today.” She responded, “I never thought of it that way. I like having you around. It’s fun.”

Checking-In. During Pam’s prep period, we met to reflect on how things were going. Pam told me she was enjoying co-teaching and using technology in her classroom. This was a completely different outlook from what she had this time last year. Regarding the project, she said, “My students really get it and understand the information better with technology. They are motivated and into it.” She expressed that she was thinking about the next lesson and wanting to incorporate technology. She said, “My students are more engaged with technology.” The next lesson, her students will be reading the book, *Seed Folks*. I spoke to her about her objectives for the lesson. One of the objectives we discussed pertained to

student writing. I suggested blogging with her students. She thought it was a great idea.

Pam would be the first teacher in the district to blog with her students. I explained this to her and asked, “Does this make you nervous? What if something goes wrong?” She promptly responded, “What could go wrong? We try something and if it doesn’t work, we try something else!” Wow, this was a completely different teacher from the previous year. Her confidence with technology has increased. However, I felt that she would not be this comfortable if I were not in her classroom every day. Nonetheless, I was proud of the progress she was making and her flexibility to try new things. Before Pam left our meeting, she said, “After teaching this, English is going to be boring.” If this is how she felt, I wondered what her students were thinking.

Modeling. The students continued to work on their projects. More and more students were bringing in pictures from their childhood to put into their projects. While they were working, I reminded Pam that I had a conference to attend tomorrow and I would be absent. She said, “You can’t be out. I won’t know how to do this.” This alarmed me because we have been working on the project and program for about two weeks. I wanted Pam to learn how to use the technology so I could fade out my support and she could continue to work on her own. I would have to

change my coaching style to include her when a student had a technology question. To help alleviate her concerns while I was out, I suggested some students in the class that are strong in technology that could help her. Fortunately, Pam was comfortable having her students teach her and allow them take the lead.

Pam wanted to have an informal check with the students and their progress. She wanted to have the students show their work up to this point on the interactive whiteboard. She said to me, “Ok Ms. Brown. That’s technology; that’s your part.” I replied, “I’m not going to be here tomorrow. Let me show you how to do it.” Pam watched the process and then we viewed the student’s project. It was another student’s turn to show work. I asked Pam if she would like to try it, since she just watched me do it. She said, “I’ll do it but I need your guidance.” With my support, she was able to complete the task. I was going to have to remember to continue to include Pam when I answered technology questions. This was a learning experience for her, and I needed to remember this for future coaching experiences with her and other teachers as well.

Grading. Once we finished informally evaluating the progress of the students’ stories, Pam conferenced with me during her prep period. She said, “Ok, you have to help me with this. How am I supposed to grade them? They have opened themselves up so much. They are blowing my

socks off and showing a very emotional side to their stories. If it wasn't for this project, there is no way they would have opened up so much and tried. I can't grade them like a regular Power Point. This is much more than that. This is knocking my socks off." Then, she hugged me.

Pam's students were learning support students and came from a variety of backgrounds. Some students live with their grandparents; some students have parents that work in the city and commute of an hour every day, and some students live in a community home with no families. Because of this, many of the students have to provide for themselves. Pam felt that she gained trust and insight into her students' lives that she may not have known had she just assigned them to write a paper. This project provided the opportunity for them to express themselves as little or as much as they wanted to. Her students had chosen to share a lot of personal information, which caught Pam off-guard.

I recommended to her to grade the project like a Power Point but put more weight on voice rather than grammar. For example, grammar could be worth ten points while voice could be worth twenty. That way she was making sure she was meeting her objectives and also giving them credit for their expressions. She seemed pleased with this response, and she was going to do some more research and think about it.

More modeling. Upon returning to Pam's classroom, I was greeted with Pam declaring, "Thank God you are here. We are having technical problems. I almost called you at the IU for help on what to do." A student had misplaced the project that he had been working on. As I was helping this student retrieve his project, I overheard Pam telling a student, "I don't know how to record your voice. You'll have to ask Ms. Brown that one." I began to realize that her confidence with technology was diminishing. I recalled from the prior experience that I needed to involve her more in technical questions so she could start answering them. I said to Pam, "How about I show you how to record his voice? I still need to continue to look for the student's project. It is really simple to do." Pam concurred, "Ok, no problem. I am ready to learn." That was a great attitude to have. I hoped that showing Pam these little steps would increase her confidence. I demonstrated to her how to record the voices, and then she did it by herself with no problems.

After the class was over, Pam said to me, "We are going to have to do something that is not as emotional in the next project. The student that was recording his voice talked about his anger and then later how happy he became when he was adopted. I wasn't ready for this emotional trip today."

I felt the next day that my modeling of recording voice paid off. Another student wished to record his voice to the story. Pam volunteered to help him: “I know how to do that!” She took the student into the next room so it was quiet enough for him to record his voice. I was very proud that she took the lead while I continued to work with other students. Five minutes later, Pam came back into the classroom very frustrated, “I don’t know what happened. It’s not working today. We need you.” I went over to see what the problem was. Pam said, “I’m not good in these situations. I become very frustrated and don’t know what to do.” I reassured her that we would figure out the problem together. While recording the voices, Pam forgot to push one button. Pam got anxious when she could not figure out what to do. One setback like this could hinder her learning process. I hoped that would not be the case.

Ready for more. The day finally arrived when the projects were due, and we watched the students’ accomplishments. The project took about a month to complete. It could have been completed sooner, but some barriers arose. Pam did not always keep to her deadlines for the students, and 4Sight testing took two class periods away from working on the project. Also, the projects were completed in class. The students were not required to work at home.

After we viewed each student's project, Pam and I met to debrief on the experience. She was amazed at how hard they worked on their projects and how they shared personal information about themselves. Pam noted in her teacher lesson reflection form (Appendix F) that she would like to improve on being "more structured so the students would have better guidelines to work from." This was something she and I talked about to make her expectations for the students more clear. Pam believed that using technology helped students learn because "they are accustomed to working with technology. They are comfortable and can show their skills and talents more readily." She felt the students "took pride in what they did" and "it was a good choice for everyone."

We started planning the next step we would take for her students. Pam said, "Should we start blogging tomorrow or do you need a break?" This was a remarkable transformation from the Pam I knew last year. Every lesson Pam planned, she was now thinking about whether technology would be beneficial to her student's learning. I told her "I'm ready for whatever you want me to do."

Come on in. As I walked into Pam's room, I was greeted with "Ms. Brown, come on in and have a seat. I am just telling the students about the next project." Pam wanted the students to learn how to research both primary and secondary sources. We discussed having the students present a

newscast about an issue that was relevant to them. We spent the next few class periods brainstorming with the students some issues that were interesting to them. We gathered a list and had the students participate in a silent poll. Each student anonymously wrote down one of the topics that they were interested in researching. Pam and I tallied the votes, and almost all students wrote down the topic teen sex. We decided to use the blog to pose questions students could discuss about during the research process.

I demonstrated to the students how to use the blog. They logged onto the site and had to answer the question, “What will you be doing over Thanksgiving break?” The format of the blog was similar to word processing so the students already knew how it worked. The students answered the question and some experimented with different font and, colors, as well as importing pictures. I encouraged them to become familiar with the site because this was where we were going to be communicating for the duration of the assignment. The bell rang, and Pam thought that after Thanksgiving break, we could show the students how to use netTrekker. She had some odds and ends she needed to finish with the class before we continued with this project.

Flexibility. Thanksgiving break was over and I prepared to present netTrekker to Pam’s students. Pam, on the other hand, had a different

agenda. She decided over Thanksgiving break that she wanted to show her students the movie *Dangerous Minds* before we went any further. She felt that this would hook the students into the controversial issues project and get them thinking. She wanted them to know “what they can do when someone believes in them. You and I believe in them when not too many teachers do. This project is going to be tough for them and I am hoping to build their esteem by seeing the relationship between this classroom and the one in the movie. We are going to use the blog to ask them questions related to the movie.” I told her that it is her classroom and if this is what she thought the students needed, then we would do it.

We watched the movie over the next three days. About five minutes before the bell rang each day, Pam stopped the class to verbally ask them questions. I reminded her that she mentioned using the blog to have the students respond to her questions and asked her if she was still interested in doing this. She came down to my office during her planning period to learn how to do this. I showed her the steps to post questions in the blog and created one question for her. I told her, “Now it’s your turn to go home and put the rest of the questions into the blog.” Pam said, “I’m willing to try.”

The next day I came in, Pam had projected on the interactive whiteboard the questions she wrote into the blog and just started to have

her students log into the site. I told Pam how impressed I was. She said, “Just wait. It gets better.” Pam then showed me and her class that she responded to each student’s post about their reflection on the movie. I was completely amazed that she took this initiative and how independent she was becoming. She said, “You know, I’m doing a lot better with this technology stuff.” I most certainly agreed.

Once the movie had finished and the discussion of the movie had subsided, it was the middle of December. We returned to the research project. Pam had to revisit the expectations and guidelines of the project for the students. She reminded them, “You are going to write a paper researching the issue teen sex. Each of you have a particular part that you are going to add, like teen pregnancy, STDs. Then Ms. Brown will bring the video cameras to the classroom and we will create a newscast of the information.” To begin searching for information online, she wanted me to teach her students how to use netTrekker tomorrow.

I entered the classroom ready to show her students netTrekker. Pam had thought of another idea the night before that she wanted to do with her students. When I arrived in class, Pam was leading a discussion about sex education. She had created a Power Point including some research she found related to the topic. This served as a model for her students to show them the kind of information that they would be

gathering. After the lesson was over, she apologized for not sticking to the original plan. I said that it was fine and I am flexible. This was another example that it was not my classroom and I could only offer suggestions. Ultimately, the final decision was the teacher's.

It's not the end. I taught Pam's students how to use netTrekker and they began working on their research. Just as with Ann, we did not finish the project by the time my study had concluded. I met with Pam one last time to complete her post survey and ask her interview questions. Her post survey results showed that she rated herself higher on all the statements. Instead of mostly threes out of fives, she moved to mostly 4s with a few 5s in formative assessment and student collaboration. When she left my office, she turned and said, "This isn't the end of us. We'll be doing many more projects." I replied, "It's just the end of the surveys, notes, and interview questions. We will still continue to work together."

Incidental Technology Learners

In my study, I had a few more teachers that participated and signed consent forms; however, they did not complete any surveys, forms, or interview questions. These teachers were not as ready as Ann and Pam to integrate technology, but were interested in trying one or two things. My study was designed for me to meet teachers where they were with technology, and help them progress forward at their individual pace. I was

available to work with teachers when they felt they were ready and wanted my help.

Ready to Wiki

In late October, I received an email from Kevin, a science teacher. He was inquiring about creating a wiki for a class project. We set a time during his prep period for me to come to his classroom later in the week. This was an interesting situation. In mid-September, I facilitated a professional development on the Promethean board for his department. During that session, Kevin had asked me about wikis. He was very interested in setting one up for his class, but did not know how. I showed him some examples and asked him to email me when he was ready to start. Often, I would pass him in the hall and he would say, “I really want to start that wiki. I’ll have to email you.” I wondered why it took a month and a half for us to meet. I was beginning to feel that time and standardized testing had reared its ugly head again.

When we finally met, we created an account and set up the wiki for his students. I showed him the features of the wiki, such as how to edit the page, use the discussion board, and access the history tab. Then, we brainstormed ways to efficiently implement the project. He wanted each of his students to research an invasive specie of their choice. They would then synthesize this information and post it onto the wiki. We brainstormed

how to logistically design the wiki for this purpose. We decided that each class would have their own page and within that page, there would be links to the designated specie. Kevin was the first teacher in the school to create a wiki. I was looking forward to see how it would develop.

Kevin was very comfortable using technology. I asked him if he needed help with students creating accounts and he said, “No, that’ll be easy. I may have you on stand-by for wiki questions, though.” “That’s perfectly fine. Email me with anything you need,” I replied. That was the relationship Kevin and I kept throughout the project. He was on his own with the wiki and every once in awhile, he would email me with formatting questions. When the project was over, I asked him his thoughts. He said, “This was really cool. The ability to put everything in one spot and not have a hundred papers all scattered around me, helped me tremendously.”

Teach who?

Angela is the ESL teacher at the high school. Last year, I had helped her students with their ESL graduation project. We created Photo Story projects for students to share about their home country and their trip to America. Angela and I had a good working relationship. She emailed me because she missed the professional development day in October when I demonstrated how to use the Promethean Board to the English

department. She was interested in learning about it and had asked me to show her how to use it.

Throughout the study, I typically met with teachers during their planning periods. I assumed this would be the case with Angela. When I walked into her room, she had four students there with her. She said, “Ok, teach us. We are ready to learn.” At first I was confused what she wanted me to show them. I knew how teachers could use the board, but was never asked to show the students. I feared they would be bored.

When I started showing Angela and her students how the tools worked, the students began asking questions about what it could do and commented how “cool” it was. Then I began thinking. Showing students the Promethean board was not a bad idea. If I worked with a teacher on the board and if later, in the middle of class, they had a question or forgot how to do something, instead of stopping the lesson and calling me, a student in their class could help them and then could continue with the lesson with minimal interruptions. This was the beginning of defining the role for students as experts.

I modeled for Angela how the board could be used by engaging her students and having them come to the board. To complement the Promethean board, we also used money from other grants so every teacher could have a learner response system called ActiVotes. Angela

and I created questions for the students to answer. Angela commented, “I didn’t think it’d be this easy. This was very helpful.”

DATA ANALYSIS

Reflective, Methodological, and Analytic Memos

Action and reflection need to coexist in order for transformation to occur (Freire, 2007/1970). With this in mind, I analyzed and reflected upon my data in numerous ways. I read works from educational theorists Dewey (1997/1938), Freire (2007/1970), Delpit and Dowdy (2002), and Vygotsky (1978), and wrote reflective memos applying their underlining theories to my research study. Then, I wrote a methodological memo in the form of a mid-study data assessment. I gathered all the data that I had collected for eight weeks and analyzed it. My research question was stated, and emerging sub-research questions were also identified. I summarized the data and gained insights into my study. I formulated an informed action plan that provided me with the direction I needed to take in order to continue my research efficiently. Finally, I completed an analytic memo on figurative language analysis that existed in my data. I identified ten metaphoric statements and decoded what the actual meaning and the intended meaning was for each statement to understand the author's purpose. The data used for these three types of memos were found in my field log, interviews, surveys, and questionnaires.

Field Log

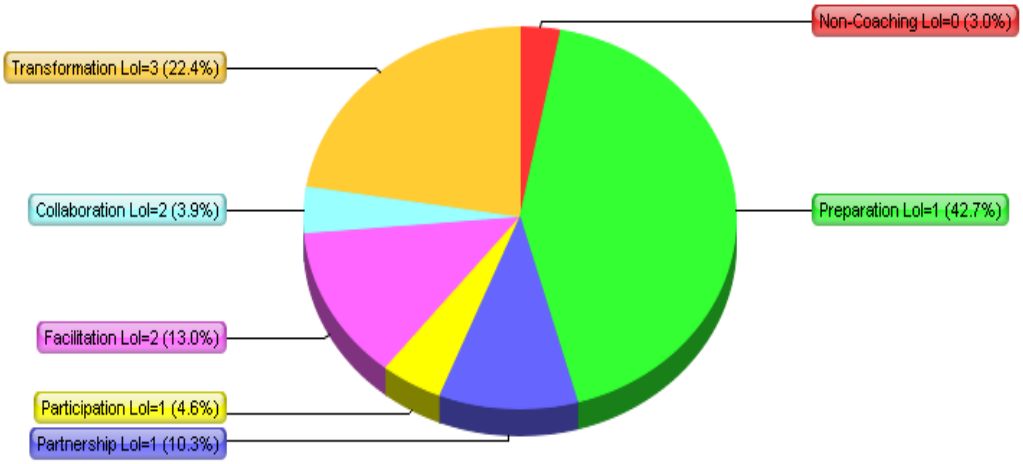
The field log was a place to record daily accounts of what happened in the classroom during my research. Everything that went on in the classroom, including “quotes, observations, and reflections” (MacLean & Mohr, 1999, p. 12), was recorded in my log. I kept my observations and thoughts separate by writing my observations on the left side of the log, and my thoughts on the right side. In analyzing my field log, I began to create codes. Ely, Vinz, Anzul, and Downing (1997) explain codes as interpretations of the data collected. The interpretations occur when patterns arise and are congruent with each other to create categories. The codes form categories that are placed into “bins.” The codes and coding bins are created “to enable the researcher to discern relationships, patterns, and themes” (p. 162). As my research continued, I revised the codes and bins.

After I coded my field log, I created an index to show the codes, corresponding page numbers, and related codes. It was an easy way for me to find the codes that I needed. Then, I narrowed the codes that were relevant to my research study and organized them into a graphic organizer (Figure 4). From each of the coding bins, I created a parallel theme statement that helped to determine the findings of my study.

Coach Log

The coach log was another place where I recorded my daily coaching activities from the beginning to the end of my study. The graphs below demonstrate how the role of the coach evolved from September to December (see Figure 3). The “preparation” activities have decreased by 15% while “collaboration” and “transformation” activities increased by 8% and 5% respectively. The reason for this is I was actively involved in the classroom, e.g., co-teaching, co-planning, and modeling, rather than developing resources or research for teachers. The “non-coaching” activity was minimal by the end of the study.

September 2008



December 2008

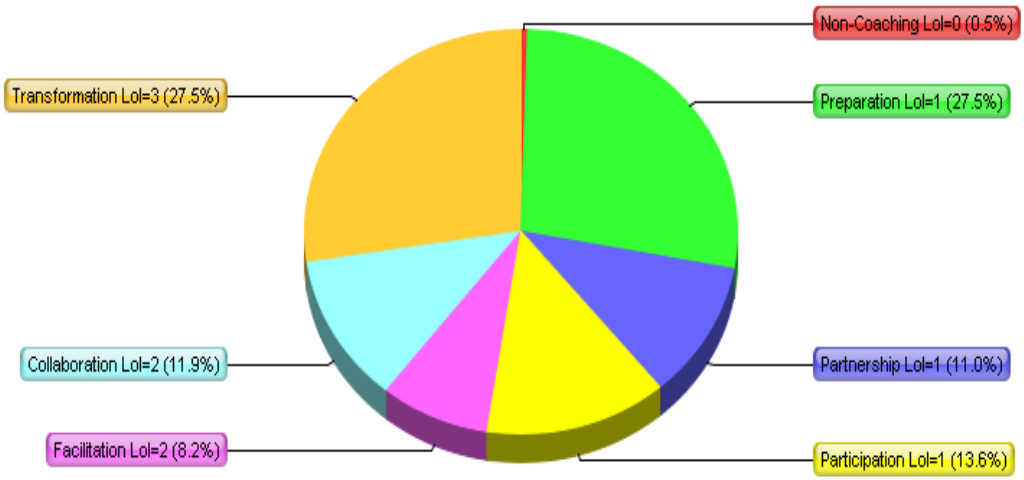


Figure 3. Coach Log

Surveys, Interviews, and Questionnaires

As noted in the Methodological section, I administered surveys and teacher reflection checklists, and conducted interviews with the participants. All of the data gathered from the surveys, interviews, and questionnaires, i.e., lesson observation checklists and teacher lesson reflection forms, were analyzed and coded. Once they were coded, relationships between the codes were formed and sorted into bins. In order to be certain I fully understood the data, the teachers and I reviewed the information and dispelled any misconceptions that I may have had during our teacher meetings.

Coding Bins

New Roles Defined for Students, Coaches, and Teachers	**Barriers**
• Student as expert • Staff developer • Just in time technology support • Co-teach • Resource gatherer • Technical assistance	• Poor preparing • Fear • NCLB • Pacing/ slow moving • Testing • Time • Uncontrollable barriers
Teacher Reported Reactions to Technology	**Teacher Reported Coaching Benefits**
• Easier than thought • Engagement • Excitement • Expression • Fun • Hard-work • Better comprehension • Higher order thinking skills • Motivation • Proud	• Technology expert • Team • Brainstorm • Co-plan with coach • Fun for teacher • Helpful • Model • Positive reinforcement • Reflection • Safety net • Transformation
Professional Development	
• Co-plan with teachers • Knowledgeable of audience • Background knowledge • Hands-on • Meaningful/Applicable to classroom • Model technology use	

Figure 4. Coding Bins

FINDINGS

***Focused Professional Development*: Components that ensure effective professional development include meeting with teachers individually to co-plan, model instruction, and oversee hands-on implementation.**

Previously as a staff developer, planning for professional development was an isolated event. The administrator of the district would contact the Intermediate Unit for a professional development on a general topic. It was my task to ask probing questions to the administrator to specifically identify what they wanted their teachers to learn. Basically, I was trying to determine what their teachers needed through the administrator's perception. I would then develop the professional development with this secondary information. I never had the opportunity to discuss the topic with the teachers to obtain essential primary information before the session. Sometimes, I would "hit the target" of what the teachers needed, and sometimes I would miss. I also felt that there was not a sustained relationship between myself and the teachers.

The process of planning and teaching professional developments as a CFF coach in the school was a completely different experience. The principal informed me of the topic that I would be presenting, namely working with the Promethean Board, and what departments I would be

working with, English and math. Being in the school provided me with the opportunity to meet with teachers before the session to co-plan what their needs were on the topic provided by administration. I formulated an outline of what the session would look like for each department and met with the head of each department to co-plan the session. By meeting with each department head, I gained insight into the level of comfort and knowledge with the interactive whiteboard. This provided me with specific feedback on how to carry out the sessions.

Another benefit of working as a coach in the school was that I was able to acquire essential background knowledge of the school and of the audience. This was helpful because I knew what demands and initiatives the school and administrators were expecting from the teachers. I also had knowledge of the teachers who would be resistors and those who were the leaders in each department. I was able to interact efficiently with them and identify who would support what I was teaching.

From co-planning with Jim, the English department head, I learned that his department needed hands-on learning. I arranged with the school office to have five rooms set up around my professional development room so teachers could explore what they were learning. Renee, an English teacher, was very happy to have this chance to work with other teachers in her department to learn how they were using the Promethean

Board in their lessons. As Delpit and Dowdy (2002) point out, it is not that teachers are without ideas for teaching, but rather the dilemma is how to use the resources in the classroom. Professional developments need to be applicable to the classroom and that was what Renee referred to.

Teacher Reported Reactions to Coaching: **Coaching that benefits the teacher by providing support, enabling collaboration and brainstorming, modeling instruction, and creating a safety net to try new things, can lead to transformation in the classroom.**

Teachers had positive reactions to having an instructional technology coach in their classroom. Teachers needed on-site support to learn how to use technology in their classrooms and help to guide them through the process. Ann stated in her interview, “Having you help with projects has made me more confident to include technology in my classroom. That is the main thing because without my confidence, my kids would not benefit from all the capabilities we have.” Pam stated that having a “technology expert” in the classroom to help “apply the technology to the classroom” for support made the process of technology integration more seamless.

Before integrating technology into lessons, I would meet with the teachers to collaborate. As we co-planned instruction, the objectives were specifically identified and were constantly revisited to ensure technology

was purposively utilized. Ann thought these meetings were helpful because “we worked as a team. I would have the ideas of what I wanted to do in the classroom and you knew how we could carry them out using technology. That has helped a whole lot.” Pam felt that these meetings helped to “better understand my students. This is how they are learning and what they are doing every day. If it weren’t for meeting with you, I wouldn’t know that it [these technologies] even existed.”

Freire (2007/1970) identifies dialogue as having two dimensions, reflection and action, and “if one is sacrificed-even in part-the other immediately suffers” (p. 87). He also says “dialogue becomes a horizontal relationship of which mutual trust between dialoguers is the logical consequence” (p. 91). Research for coaching states that in order for coaches to act as change agents, they must first build a trusting relationship with the teacher (Knight, 2004; Learning Point Associates, 2004). I met with teachers to discuss lessons immediately after we taught. We would reflect about the lesson if any changes needed to be made, how well the students understood the content, and what the plan would be for the next day. These conversations were critical for the action-reflection process.

There were many times that I would co-teach with teachers to model how to use the technology with their students. This allowed the

teachers to see how technology would be used. Eventually, I would fade out my lead in the classroom and support the teachers with technology as they led the classroom. I did this in order for the teacher to have the confidence to be able to do this on their own. As a coach, I was following Vygotsky's (1978) zone of proximal development, which states, what you do with assistance today, you will be able to do by yourself tomorrow (p. 87). I found that teachers reached this stage at various times. Ann was more aggressive with learning the technology, while Pam depended on me for technology assistance.

Having a coach in the district provided teachers with a safety net to integrate technology in the classrooms. Martha, a special education teacher, expressed this when she mentioned how safe she felt trying something new. She knew that I was in the building if something did not go according to plan. Ann and Pam had similar reactions to having a coach in their classrooms. Pam said during her interview, "I've seen that I have grown and I have you standing next to me to help me get there. I couldn't do this without you."

The pre and post surveys showed improvement in both teachers. Pam was unsure of herself when she completed the pre survey and was disappointed that she considered herself mostly 3s. In her post survey, all

of her scores had gone up. She even rated herself a 5 for “provide student opportunities to collaborate on assignments”. Ann also improved from mostly 4s to 5s.

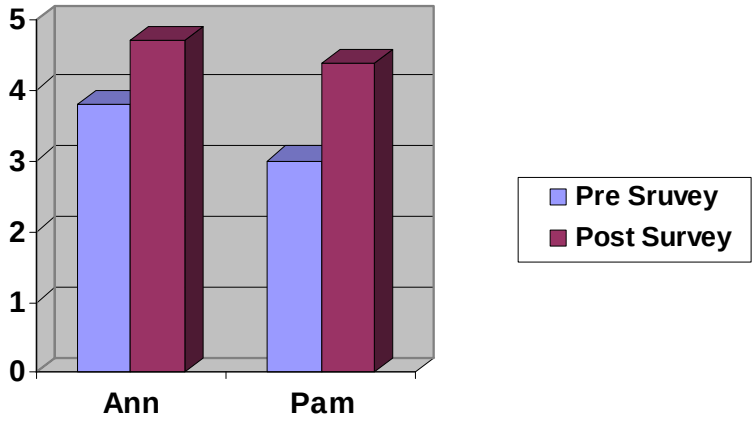


Figure 5. Pre and Post Survey Results

***Teacher Reported Reactions to Technology*: Teachers find that utilizing technology allows students to express themselves, engage in higher order thinking skills, comprehend information, and provide motivation.**

Pam had a difficult time grading the Autobiography project that her students created. She was amazed by how hard her students worked on their projects and how much they expressed themselves. She felt technology provided them with the ability to creatively convey their life stories. If she did not use Photo Story and instead had her students write a paper, she felt that her students may not have shared as much

information about themselves. She was very proud of their accomplishments.

Similarly, Ann saw “more creativity” and “greater involvement” in her students, and they had “a deeper understanding of the content and utilized higher order thinking skills because of the link to technology”. She also pointed out that having laptops in her classroom made projects more convenient, as she did not have to coordinate schedules with the library and writing lab where the majority of the computers are kept.

In Ann’s classroom, she and I observed excitement in her students when we introduced the character analysis project. She had her students research information about authors during the 18th century. Then, the students were to synthesize this information they gathered and create a “MySpace” page. Once we told about the assignment, two students in her class “high-fived” each other. Later, when I talked to Ann about this reaction, she pointed out that it is motivating them because this is how her students are communicating and is the world they are growing up in. She commented, “It’s fun for them but they are also learning. They just don’t know how much yet.”

Pam and Ann both integrated technology projects with their lower level students. These students went to vocational technical school and did not choose the traditional four year college route. Pam and Ann observed

that their students were highly motivated and engaged in the process the entire time.

New Roles: **When implementing technology and instructional coaching into the classroom, new roles, such as student as expert, resource gatherer, and technical assistant, emerge.**

There were times that I would be at a conference or professional development and was out of the district. Pam was uneasy about me not being there on these days. When this occurred, I would identify some students that Pam could depend on to help with any technology questions that may have occurred while I was out. These students were experts in technology. Pam had the kind of relationship with her students that this was not an issue. Ann recognized that her students were experts by believing that “I am a technology immigrant. This is the world they are brought up in. They know more than me.”

As a coach, my role varied from day to day. Some days I was a staff developer teaching teachers how to use their equipment and integrate technology during in-service days. Other days, I acted as a resource gatherer. This was made apparent when Ann needed video sites for her students to use in their controversial issue project. I went to the Internet and gathered as many sites as I could. I also acted in this role when she wanted to have her students create the MySpace page. She

found this to be very helpful by declaring in her interview, “Anytime I have asked you to find out how to do something, you quickly found it out and that is exactly what I need.”

Predominately in the beginning of the study, my role was to provide technical assistance. This meant that I made certain the wires to the computer and interactive whiteboards were connected correctly. I would also troubleshoot any other minor technical problems that teachers faced as they eased back into the school year. During the study, this role never ended and will probably continue throughout the school year. Situations kept occurring like those I had experienced with Renee. Teachers wanted to know how to incorporate videos into Power Points or how to fix the image streaming from the projectors. Technical assistant and just-in-time technology support were roles that intertwined each other.

The last major role that emerged as a technology coach was one that also emerged for the teachers. It was co-teaching. Often times, I took the role as the technology teacher and the teacher acted as the content teacher. As I interacted with their students more each day and had the opportunity to co-plan the lessons with the teacher, I was able to start to answer questions regarding the content. Ann quickly learned the technology that was integrated into the classroom so she was able to

answer technology questions as well. Pam was a little more timid with the technology but gradually began to learn the technology.

Barriers: **Barriers that may arise when integrating technology into secondary classrooms are lack of a common vision among stake holders, fear of the utilization of technology, outside testing requirements, and time constraints.**

Integrating technology in the classroom caused some barriers to emerge. The first barrier was lack of a common vision among stakeholders. Mike is the Director of Technology for the school district. While he supported me with the Classrooms For the Future initiative, he was also hesitant in some aspects. For example, when I wanted to start moving forward and have teachers create podcasts, he was cautious and wanted to look into it in a slow manner. The technology department did not see the value of some programs and took these programs off the laptops. They also blocked sites that they deemed inappropriate. This was a problem because some programs and websites were educationally relevant, and it took some time to straighten everything out. Administration at the building level did not require teachers to implement technology into their lessons. This caused some teachers to go “under the radar” and not utilize the full potential of the equipment in their classrooms.

Other barriers were those that arose from teachers. In the beginning of my study, some teachers would tell me that “I’m ok for now” and not yet ready to implement technology. There were a few reasons that this turned out to be the case. The first to consider was fear of technology. Using technology for the first time can be overwhelming. I repeatedly assured the teachers that they could contact me at anytime and I would be able to help them. Since some did not, I was left wondering if this was because they never had a coach before and they were not sure what to ask me. Maybe they felt like they would be bothering me or just did not know where to start or what to ask.

The teacher’s day was packed with so many things beyond daily lessons. The biggest responsibility they had next to teaching was the pressure of state testing. They were required to have all their students score proficient on the PSSA. The demands of the PSSA made them feel that they had to focus on covering the curriculum. If that was not enough, they had to take class time away for 4Sight testing, a practice test given once a quarter to help with the PSSA.

All of these factors led to the final barrier teachers had to face, which was time. The teachers in the study found time during their planning period and in between classes to plan and meet with me. I offered to meet with other teachers during their hall duty, before school, and after school

but few agreed. Some teachers were coaches and could not meet after school or had children they had to take care of. During the day, they had all the above requirements to fulfill plus lesson planning, meeting with students, and preparing for the day's lessons. In-service days were filled with other initiatives administration declared teachers must attend.

Conclusion

Throughout my study, I collected data and analyzed it to discover what are the observed and reported experiences when supporting the integration of technology in the secondary classroom. I have found that new roles for students and teachers emerge. I also reported benefits that teachers experienced from working with a coach and integrating technology into their lessons. Barriers did occur during the study, but proper planning can help to alleviate some of the issues. Overall, teachers and I felt that the coaching experience was beneficial and positively impacted the climate of the classroom.

NEXT STEPS

As my study came to an end, I reflected upon the data that I collected and analyzed. I found underlying sub-research questions that I would like to pursue in order to more fully answer my research question. What does a high school look like that has successfully implemented technology into their classrooms? What role does the coach play in this model? How do the central administration, building administration, technology department, and teachers communicate and determine a common vision for technology integration? What is each stakeholder's responsibility?

Further research needs to be considered on effective ways of conducting professional development. I feel that if the teachers received professional development on the equipment in their room and it did not require extra time added to their day, they may have been more willing to integrate technology. I wonder what are some creative ways schools have found time within the school day for professional development. In my literature review, I mentioned briefly one creative way to alter the school schedule by having late starts or early dismissals once per week. I question what are other ways schools alter their schedule for professional development while still being able to meet the demands of standardized testing. I think that it does not have to be a formal professional

development, but even time to play and explore their equipment so the teachers can gain ideas to apply the resources to what they are teaching. This might be supported if schools have a common planning time for secondary teachers with their departments.

In my study, I found that Pam was becoming very dependent on me for anything that related to technology. In the beginning of the study, I was responsible for all technology questions, setup, and troubleshooting. I acted this way because I thought that was what I was obligated to do. Actually, by taking on this role, I was hindering her learning. As a coach, my role was to support teachers and then fade my support away so the teachers would be able to utilize the technology on their own. For the rest of the school year, I pulled back my lead and had her do the steps related to technology so she could learn how to do it. I would keep Vgotsky's zone of proximal development in the back of my mind when working with her and other teachers.

I would be interested to research the impact effectively using technology as a learning strategy had on student test scores. The teachers in my study said that they had seen increased comprehension, engagement, motivation, and excitement in their students for learning. As a society, we are becoming more focused on and driven by test scores. Were they increased as a result of learning this way?

Finally as a teacher-researcher and life-long learner, I will continue to research best practices to integrate technology and coaching into classrooms. As coaching is relatively new and therefore, not too many studies have been conducted in this area, I will closely monitor research gathered by Knight and Kansas University Center for Research on Learning on how instructional coaching is impacting schools and teachers.

I found that being able to co-plan and reflect with teachers about lessons has greatly enhanced their experiences and successes with coaching and technology integration and will continue these practices as the year progresses.

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Appendix A

MORAVIAN COLLEGE
A SMALL NATIONAL TREASURE
1742

1200 Main Street
Bethlehem, Pennsylvania 18018-6650

TEL 610 861-1300
WEB www.moravian.edu

August 8, 2008

Heather Brown
[redacted]

Dear Heather Brown:

The Moravian College Human Subjects Internal Review Board has accepted your proposal: "Supporting the Integration of Educational Technology into the Secondary Classroom." Given the materials submitted, your proposal received an expedited review. A copy of your proposal will remain with the HSIRB Chair.

Please note that if you intend on venturing into other topics than the ones indicated in your proposal, you must inform the HSIRB about what those topics will be.

Should any other aspect of your research change or extend past one year of the date of this letter, you must file those changes or extensions with the HSIRB before implementation.

This letter has been sent to you through U.S. Mail and e-mail. Please do not hesitate to contact me by telephone (610-861-1415) or through e-mail (medwh02@moravian.edu) should you have any questions about the committee's requests.

Debra Wetcher-Hendricks
Chair, Human Subjects Internal Review Board
Moravian College
610-861-1415

Appendix B

MORAVIAN COLLEGE
A SMALL NATIONAL TREASURE
1742

Department of Education
1200 Main Street
Bethlehem, Pennsylvania 18018-6650

TEL 610 861-1558
FAX 610 861-1696
WEB www.moravian.edu

Administrator consent form

Dear [redacted]

I am completing a Master of Education degree at Moravian College. My courses have enabled me to learn about the most effective teaching methods. One of the requirements of the program is that I conduct a systemic study of my own teaching practices. This semester, I am focusing my research on integrating technology into the classroom. The title of my research is *"Supporting the Integration of Technology into the Secondary Education Classroom"*. Incorporating technology in the classroom will prepare our students with skills for the 21st century workplace and higher education.

As part of this study, I will ask teachers to meet with me to design and implement technology-enriched lessons. They will also be asked to complete surveys, interviews, and specific activities to enhance lessons. All meetings and activities will occur during the regular school day. This study will take place from September 1st, 2008 to December 24th, 2008.

The data from the observations, surveys, and interviews will be collected and coded, and held in the strictest confidence. No one except me will have access to the data. My research results will be presented using pseudonyms – no one's identity will be used. I will store the data in a locked cabinet. At the conclusion of the research, the data will be destroyed.

Teachers may choose at any time not to participate in this study. However, they must participate in regular teaching responsibilities. All teachers will participate in the Classrooms For the Future program. In no way will participation, non-participation, or withdrawal during the study will have any influence on any aspect of the class. If they experience any distress as a result of this study, they can contact the guidance office at [redacted] or the principal, [redacted] at [redacted]

We welcome questions about this research at any time. Participation in this study is voluntary; refusal to participate will involve no penalty or consequence. Any questions you may have about the research or about the process for withdrawing can be directed to me, Heather Brown, [redacted] or my supervisor, Kelly Pauling, [redacted] or my advisor, Dr. Charlotte Zales, Education Department, Moravian College, [redacted]. Any questions about teacher rights as a research participant may be directed to Dr. Debra Wetcher-Hendricks, Chair HSIRB, Moravian College, Bethlehem, PA 18018, [redacted]

Sincerely,

Heather Brown

Heather Brown

I attest that I am the building administrator and I understand the research project entitled Supporting Integration of Educational Technology into the Secondary Classroom. I give permission to conduct this study. I have read and understand thi[redacted]d received a signed copy.

Administrator signature: [redacted] Date: 9/6/08

Appendix C

CONSENT FORM

Dear Educator,

I am completing a Master of Education degree at Moravian College. My courses have enabled me to learn about the most effective teaching methods. One of the requirements of the program is that I conduct a systemic study of my own teaching practices. This semester, I am focusing my research on integrating technology into the classroom. The title of my research is *"Supporting the Integration of Technology into the Secondary Education Classroom"*. Incorporating technology in the classroom will prepare our students with skills for the 21st century workplace and higher education.

As part of this study, you will be asked to meet with me to design and implement technology-enriched lessons. You will also be asked to complete surveys, interviews, and specific activities to enhance lessons. All meetings and activities will occur during the regular school day. This study will take place from September 1st, 2008 to December 24th, 2008.

The data from the observations, surveys, and interviews will be collected and coded, and held in the strictest confidence. No one except me will have access to the data. My research results will be presented using pseudonyms – no one's identity will be used. I will store the data in a locked cabinet. At the conclusion of the research, the data will be destroyed.

You may choose at any time not to participate in this study. However, you must participate in your regular teaching responsibilities. All teachers will participate in the Classrooms For the Future program. In no way will participation, non-participation, or withdrawal during the study will have any influence on any aspect of the class. If you experience any distress as a result of this study, you can contact the guidance office a[redacted] or the principal, [redacted]

We welcome questions about this research at any time. Your participation in this study is voluntary; refusal to participate will involve no penalty or consequence. Any questions you may have about the research or about the process for withdrawing can be directed to me, Heather Brown, [redacted] or my supervisor, Kelly Pauling, [redacted] or my advisor, Dr. Charlotte Zales, Education Department, Moravian College, [redacted]. Any questions about your rights as a research participant may be directed to Dr. Debra Wetcher-Hendricks, Chair HSIRB, Moravian College, Bethlehem, PA 18018, 610-861-1415.

Sincerely,

Heather Brown

I attest that I am at least 18 years of age, that I read and understand this consent form, and that I received a copy.

Subject signature: _____ Date: _____

Appendix D

Pre/Post Survey

Directions: Please complete the survey reflecting upon your classroom. Use the following scale to rate your answers: *5- Strongly agree; 4- Agree; 3- Undecided; 2- Disagree; 1- Strongly Disagree.*

___ 1. I incorporate technology into most of my lessons.

___ 2. I am comfortable integrating technology as a teaching tool in my classroom.

___ 3. I provide students opportunities to collaborate on assignments.

___ 4. When I plan a lesson, I consider how to effectively implement technology.

___ 5. I effectively design and deliver authentic and engaging project-based activities in my classroom.

___ 6. I use formative assessment on my students and adapt lessons accordingly.

___ 7. My classroom is a 21st century learning environment.

On the left, please identify any technology that you currently use in your classroom. On the right side, please explain how you use it.

Type of Technology	How is it used

Appendix E

Lesson Observation Checklist

Criteria	Not Yet 0	Some Evidence 1
Elements of a Constructivist Classroom		
Student-Centered		
Relevant to their life		
Collaboration		
Utilizes ongoing assessment		
Higher order thinking skills		
Teacher as a facilitator		
Connect prior knowledge to new knowledge		
Engaging/Active		
Multiple objectives		
Learning styles and multiple intelligences are considered		
Technology Use		
Student-Centered		
Aligned with the lesson objectives		

Comments/Notes on the lesson

Appendix F

Teacher Lesson Reflection

Criteria	Not Yet 0	Some Evidence 1
Elements of a Constructivist Classroom		
Student-Centered		
Relevant to their life		
Collaboration		
Utilizes ongoing assessment		
Higher order thinking skills		
Teacher as a facilitator		
Connect prior knowledge to new knowledge		
Engaging/Active		
Multiple objectives		
Learning styles and multiple intelligences are considered		
Technology Use		
Student-Centered		
Aligned with the lesson objectives		

What was the most valuable part of the lesson?

What would you like to improve on for next time?

Do you think technology helped your students in learning? Why?

Do you think a constructivist approach helped your students learn? Why?

Any additional comments you would like to make about the lesson.

Appendix G

Interview Prompts

1. Tell me about using technology in your classroom (i.e., lessons, yourself, students).
2. Tell me about your experience in our coaching model.