TECHNOLOGY COACHING AND INTEGRATION:
TEACHERS’ PERCEPTIONS OF SUCCESSFUL STRATEGIES

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CHAPTER 1. INTRODUCTION

Technology advancements have provided endless methods in approaching the way teachers present content, design class activities, and assess student learning. In an effort to integrate these new methods to both engage students and prepare them for an increasingly digital world, technology coaches have emerged to ensure teachers not only survive the learning curve of the digital shift, but embrace technology to improve their instructional methods. This study investigates teachers’ perceptions of how technology coaching, specifically at the secondary level, affects their integration skills.

Statement of the Problem

Five core attributes defining effective professional development can be applied to a technology context, and a correlation between technology support roles and teachers’ beliefs regarding their technology skills has been found, but the secondary level seems to be an underrepresented sample (Kim, Kim, Lee, Spector & DeMeester, 2013; Kopcha, 2012; Storz & Hoffman, 2013). Hew and Brush (2007) identified gaps for researching K-12 technology integration after analyzing 48 technology integration studies of all types; studies were not all related to teachers’ perceptions, but those that were appropriately called for self-reporting. Half of those studies also relied upon self-reported data. Further recommendations included a thorough description of methodology and demographics, longitudinal studies, and inclusion of stakeholders’ perceptions. This study includes leadership stakeholders’ perceptions, including administrators’, rather than limiting to teachers’ perceptions.

Desimone (2009) found that professional development should focus upon teachers’ content and provide opportunities for active learning, maintain coherence, endure at least a full semester, and incorporate collective participation. This measured learning experiences of general
professional development, so it can be applied to technology professional development to
determine consistency in the data. Furthermore, rather than sampling teachers who are self-
identified as avid technology integrators, or being limited to a small sample, this study offers a
breadth of perceptions from the secondary level; thus filling a gap in the knowledge. Storz and
Hoffman (2013) called for similar studies of professional development during transitioning into
one-to-one technological environments, as professional development approaches will serve as a
critical component of teachers’ success during this shift. This is the status of the school district
in this study.

**Purpose of the Study**

As districts invest in technology coaches to improve perceptions, actions, and abilities to meet
student needs and district goals, it is important to analyze and implement best practices. Areas to
examine include the following. What mentoring activities intending for teachers to learn how to
incorporate technology should be priority? What services do teachers find helpful in building
their confidence and skill development? Current and future expectations require districts to
prepare students for an increasingly global, digital world. Therefore technology professional
development approaches can serve as a critical component of their success in achieving this goal.

**Research Questions**

This study seeks insight into the following areas: How does technology coaching at Arrowhead
Union High School affect teachers’ perceptions of their technology integration skills? What
specific coaching activities contribute to their perceptions? What future impact might coaching
activities have on effective technology integration as the district transitions into a one-to-one
student-device atmosphere?
Nature of the Study

A quantitative study was used to measure teachers’ perceptions. An online survey was administered towards the end of the semester as a post-integration follow-up. The survey benchmark was the National Education Technology Standards (NETS) for coaches’ requirement to assist “teachers in using technology effectively for assessing student learning, differentiating instruction, and providing rigorous, relevant, and engaging learning experiences for all students” (Beglau et al., 2011, p.20). Data was analyzed for connections between specific methods used to meet the coaching goal and teachers’ perceptions of their ability to meet two goals of NETS for teachers (International Society for Technology in Education [ISTE], 2008) related to facilitating and inspiring student learning and creativity and designing and developing digital age learning experiences and assessments.

This study focuses upon teachers’ content and provides opportunities for active learning, maintains coherence, and endured at least a full semester (Desimone, 2009; Hew & Brush, 2007; ISTE, 2008). This study is also consistent with Desimone’s (2009) suggestion that surveys elicit similar information as interviews and observations as long as: the study is confidential, not linked to evaluation in any way, and questions remain framed around what teachers actually did rather than asking them to rate how well they performed. The study incorporates recommendations for creating effective professional development learning experiences.

Significance of the Study

The demographics of this study are unique compared to the literature. The sample is from one school with 120 total eligible teachers who service nearly 2,400 secondary level students, which provides opportunity to represent a breadth of secondary level voices. Technology coaches and library technology staff, self-identified technology leaders, were delimited. This study also
recognizes specific activities effective to meeting standards, beyond identifying mentoring, through the perceptions of teachers who work with technology coaches. Because the district in the study is also in the beginning stages of implementing a one-to-one technology to student environment, the call for professional development studies during this transition will be answered and implications on how technology coaches invest future time and resources could arise.

**Definition of Terms**

**Barriers.** This is defined as any action or thought that hampers teachers’ ability for growth in meeting student needs, student standards, or district goals. This does not include hardware, network, bandwidth, or other infrastructural considerations which are historically common associations to this word.

**Hawkween.** This refers to an all-staff, one day annually, mandatory professional development opportunity for the school district where the technology coach employs the connected teaching approach.

**Mentoring.** This refers to the relationship between the technology coach and the rest of their colleagues, specifically when the integration specialist takes on a technology coaching role in providing individualized support for colleagues.

**One-to-one.** This refers to each individual student having their own personal technology device to use in the classroom for learning activities and assessment purposes.

**PCT.** This refers to a weekly, optional professional development opportunity for the school district where the technology coach employs the connected teaching approach.
**Professional development.** This refers to activities, conversations, or any other type of interaction that is specially designed and implemented to impact teachers’ growth in addressing student needs, student standards, and district goals.

**Secondary level.** In this study, secondary level refers to serving high-school aged students, grades 9-12.

**Subject culture.** This refers to a trend within like-minded group, such as within a teacher’s instructional content area.

**Technology coach.** This is the person who is responsible for impacting student performance by collaborating with teachers to incorporate technology into teaching and learning. This is achieved through professional development opportunities that the technology coach designs and implements into all areas of the curriculum.

**Assumptions, Limitations, and Delimitations**

It was assumed that teachers would trust that their responses in no way impacted their employment, income, reputation, or professional relationships. This is essential in gaining accurate, truthful data. It was assumed that teachers from a myriad of content areas would participate in the study to gain a breadth of perceptions. It was also assumed that teachers understood the district’s expectations for technology integration and have a certain level of familiarity with the content of the questions in the survey in order to interpret them and answer them accurately. It was further assumed that influences and experiences beyond district professional development contribute to overall perceptions, both positive and negative.

The survey instrument was a limitation to this study because it has not been tested for validity or reliability; it is solely based upon the literature review provided in Chapter 2.
Another potential limitation of this study was driven by teachers’ decision whether or not to seek out a technology coach; similarly, in their decision whether or not to accept support when the coach reached out. This could have affected the sample size, as the study’s intent is to provide a larger representation of secondary teachers’ perceptions compared to smaller samples in the literature. There is no way to separate technology coaching from extraneous influences that unconsciously affect perceptions. Unconscious bias or perceptual misrepresentations could occur during the data analysis process, as the study administrator and teachers are colleagues. Finally, it is assumed that teachers’ perceptions do not always translate into their teaching methods.

The main delimitation of this study was the decision to not go beyond this high school sample, a sample of convenience. Broad content-area categories were created and curriculum projects left ambiguous to protect the anonymity of the participants and to reduce bias from the study administrator. An additional delimitation involves removing survey eligibility from library technology staff, including two teachers: one English and one math, as the teachers are also the technology coaches serving in a dual role. This study did not intend to measure frequency of teachers’ technology use; rather, it intended to measure the effectiveness of strategies used by those in a technology coaching role.

**Conclusion**

By surveying teachers at Arrowhead Union High School at the end of fall semester, the study intended to measure their perceptions regarding technology coaching impact on their integration skills. A quantitative survey was used to gather data from a unique demographic compared to the literature, as well as an attempt to gain insight on specific strategies within the mentoring role of technology coaches. Future technology integration coaching could impact
one-to-one environment transitioning, so implications on what activities coaches invest future time and resources into could arise as a result of this study. Chapter 2, the literature review, provides professional development background, barrier perceptions in technology professional development, and similar studies that provide successful integration contexts for this study.
CHAPTER 2. LITERATURE REVIEW

Technology advancements have provided endless methods for teachers to present content, design class activities, and assess student learning. In an effort to integrate these new methods to both engage students and prepare them for an increasingly technological world, roles are changing and new teacher expectations are emerging within school districts. This study intends to measure teachers’ perceptions of how technology coaching, specifically at the secondary level, affects their integration skills. The school district is transitioning into a one-to-one technological environment, so professional development approaches will serve as a critical component of teachers’ success during this shift.

This study seeks insight into the following areas: How does technology coaching at Arrowhead Union High School affect teachers’ perceptions of their technology integration skills? What specific coaching activities contribute to their perceptions? Team approaches also may seem cost-effective, yet a mentoring approach to professional development, including technology development, has the most consistent effectiveness (Desimone, 2009; Kopcha 2012; Storz & Hoffman, 2013). The sample includes teachers, support staff, and administrative stakeholders in an attempt to gain insight into factors that influence perceptions and practice of technology integration. The role of the traditional Library Media Specialist has experienced a shift in responsibilities and now may include providing technology mentoring support. Technology coaches have emerged to ensure teachers embrace the learning curve of the digital shift to improve their instructional methods.

This review of the literature includes a foundation of professional development approaches, perceived barriers of effective technology integration, and implications of technology integration perceptions on instruction. The intent of the review of literature on professional development approaches is to create a foundation for the purpose of this study. The
intent of the review of literature on perceived barriers is to understand how technology integration itself can be a barrier and provide recommendations for this study. The intent of the review of literature on perceptions and integration success intends to supply a context for measuring teachers’ perceptions of how the approaches of technology coaching affect their ability to deliver meaningful, technology-rich instruction. Together these three sections provide a basis for understanding the intent of this research and how it adds to the profession.

Professional Development Approaches

Technology professional development has been found to have mixed results. Measuring the effectiveness of all types of professional development approaches, including those related to technology integration, has proven difficult; yet reaching consensus on the best approaches is a critical step (Desimone, 2009; Kim et al., 2013). Review of the literature on professional development approaches builds a case for how to assess technology professional development.

Desimone (2009) sought the best way to measure professional development and its effects on teachers and students. She addressed types of activities that are defined as true professional development, conceptual framework of professional development supported by research, and implications for modes of inquiry in casual professional development studies (p. 182). She assessed teacher professional development approaches and proposed that measuring the core attributes of teachers’ learning experiences is the best approach. Desimone also found that effective professional development learning experiences fell across five categories: they focused upon teachers’ content, which may be the most important characteristic; they provided opportunities for active learning, including observations, discussion, and feedback; they were coherent, as learning was consistent with their beliefs; they had appropriate duration, because
activities less than a full semester or at least 20 contact hours were considered a barrier; and they incorporated collective participation, whether with colleagues from the school-level, grade-level, or department-level.

Desimone’s (2009) model allows for studying the impact of professional development on teachers’ beliefs as well as the influences of shifted practice on student achievement (p.185). Desimone also suggested that surveys, interviews, and observations elicit very similar information as long as the study is confidential, not linked to evaluation, and framed around teachers’ actions rather than performance ratings.

Supporting the need for successful technology integration, the United States Department of Education developed a National Education Technology Plan (NETP, 2010) to provide a framework for future technology coaching positions. The Department of Education’s goal is that by 2015 both team and individual support is ensured as an approach to bringing empowering and inspiring experiences to teachers; in effect, improving their teaching through technology use. To achieve this goal the NETP introduced the Connected Teaching Approach where teachers used their learning networks to continuously build skills until they developed a certain level of expertise which would then allow them to facilitate and collaborate in creating self-directed learning experiences for their students. According to the NETP, learning environments have become more complex due to technology and increases in time or incentives for improved professional practice are lacking; as a result the role of the technology coach continues to gain value for individual support and for facilitating group professional development opportunities.

The NETP (2010) also takes generational differences into account in the recommended approach to using technology. It recognized that younger teachers are potentially just as comfortable using technology as their students, compared to seasoned colleagues who may seem
less connected. This does not mean it is appropriate, however, to assume younger teachers understand how technology integration can improve their teaching practices better than their seasoned colleagues. The NETP outlined that teachers often work in isolated environments. Their goal is meant to support teachers in overcoming isolation, building comfort with being connected to technology, and supporting each other by 2015.

ISTE’s (2008) five National Educational Technology Standards (NETS) for teachers include: facilitating and inspiring student learning and creativity, designing and developing digital age learning experiences and assessments, modeling digital age work and learning, promoting digital citizenship, and engaging in professional growth. The NETS for coaches include assisting “teachers in using technology effectively for assessing student learning, differentiating instruction, and providing rigorous, relevant, and engaging learning experiences for all students” (Beglau et al., p.20). NETS technological competencies maintain separate teacher, coach, and student standards which have been adopted worldwide for identifying and benchmarking teacher, student, and administrator technology performance.

Beglau et al. (2011) broke down effective coaching into three data-supported models: cognitive, instructional, and peer. To the authors, cognitive coaching is based upon the theories that thought and perception produce behavior, teaching involves constant decision-making, engagement is required in new learning, and human cognitive growth never ceases (p.9). They also describe cognitive coaching activities as including modeling, planning, technology assistance, reflection, problem solving, and making clear connections between specific instruction and technology tools (p.9). Beglau et al. spend time enumerating several other aspects to instructional coaching, some of which follow. Instructional coaching focuses on the Big Four framework for how to deliver effective learning for teachers: classroom management, content
planning, instruction, and assessment. Instructional coaching activities include one-to-one or small group meetings, guiding teachers, collaborative planning, modeling, and providing feedback (p.11). Further, peer coaching focuses on collaboration to build trust, strengthen lesson design skills, and understand best practices in enhancing student learning. The stages of the peer coaching method include: access, goal-setting, preparation, activity implementation, and analysis for reflection (p.14-15).

Beglau et al. (2011) lay out important strategies and organizational relationships to the role of technology coaches. Beglau et al. concluded that engaging students in collaborative, innovative and creative authentic learning experiences was at the heart of ISTE’s NETS for coaching, as theorized to be necessary in preparing today’s students to contribute in a global, digital world. Beglau and colleagues recommended a three-pronged methodology to achieve NETS goals which support the NETP: participation in online learning communities, effective coaching models, and fully embedded use of technology (p.2-3).

Ottenbreit-Leftwich, Glazewski, Newby, and Ertmer (2010) drew from some of the same material as Beglau et al. (2011). They found a connection between value beliefs and technology integration when the instructional methods of eight K-12 teachers were examined in Michigan. The criterion used was also based on the NETS for teachers (ISTE, 2008) and interpreted experiences rather than conscious knowledge. In their study, all eight teachers were purposefully identified as award winning technology integrators. The authors explain how the teachers developed electronic portfolios and narratives explaining how each portfolio artifact supported the NETS for teachers. The portfolios were reviewed, one technology-rich lesson was observed, and follow-up interviews were performed. Ottenbreit-Leftwich et al. found that every single one of the teachers identified technology-enhanced instruction as increasing both student engagement
and motivation, and perceived that both positively impacted student work quality. The authors also found that translation strategies (which show how students may be positively impacted by technology integration) and application strategies (which show how technology-rich ideas work in practice) were both recommended for successful teacher transfer of these skills.

Only one teacher in the Ottenbreit-Leftwich et al. (2010) sample taught at the high school level. The lesson observed by the researchers was a ninth grade math class where technology was integrated using a simulation for individual student experimentation and then creation. Based upon the results of the study, the authors concludes that teachers who have identified themselves as leaders in technology might be more apt to integrating technology at higher levels, such as the single math lesson example does, compared to a random sample; they may also have predominantly positive perceptions regarding their integration skills, despite the professional development methods used in their districts.

Consistent with Ottenbreit-Leftwich, et al., Frazier (2011) also incorporated NETS framework for measuring the effects of peer coaching. The purpose of the study was to understand how peer coaching affected teachers’ comfort, instructional practices, and implications of the coaching on student achievement. Frazier included 13 voluntary sixth grade teachers. Frazier asked the teachers to complete the Levels of Technology Innovations survey to collect personal computer usage data to possibly indicate technology comfort; then follow-up oral interviews and observations were conducted. Qualitative data was analyzed by Frazier to assess teachers’ perceptions of their comfort, practices, and needs. Frazier selected coaches because of their strong leadership skills rather than technology skills, trained in technology, and coached staff in content-specific communities of practice. Frazier found positive results, offering evidence that coaching is a likely factor in improving teachers’ comfort levels and practice.
In summary, technology professional development has been found to have mixed results depending upon the coaching approach. The National Education Technology Plan (NETP, 2010) was created to increase the success of technology professional development. The NETP is meant to overcome isolation, build comfort with being connected to technology, and support each other by 2015. The plan outlined that teachers often work in isolated environments, which merits reassessment in year three of this five-year plan. The NETP outlined the focus areas of preparing and connecting teachers to meet their goal. Both focus areas reinforced Desimone’s (2009) conclusions that active learning, duration, and collective participation are effective professional development methods.

Technology coaches in this study are held to the National Educational Technology Standards (NETS) for coaches’ and implement both cognitive coaching methods and the connected teaching approach to mentor colleagues in meeting NETS for teachers. This study will take a sample of convenience of teachers with undocumented perceptions of technology integration skills in an attempt to avoid the limitation. Both translation strategies and application strategies are used in this study to measure teachers’ perceptions of their effectiveness (Ottenbreit-Leftwich et al., 2010). In an effort to achieve the NETP (2010) goal of building teachers’ skills until they develop a certain level of expertise, a look into specific professional development activities is warranted; this study may provide insight as to why perceptions differed between one-on-one versus team opportunities, and why the team opportunities were linked to both positive and negative outcomes. First it is important to understand possible barriers.
Perceived Barriers to Effective Technology Integration

Technology integration can be perceived as a barrier to success; and, therefore can be a primary reason for failure. A review of literature focusing upon perceived barriers to successful technology integration is necessary to identify recommendations for future studies.

In an earlier review of 48 empirical studies, Hew and Brush (2007) identified gaps for researching K-12 technology integration. The purpose of their review was to identify possible barriers to technology integration and provide recommendations for strategies that contribute to overcoming those barriers. They created a model showing the relationships among various barriers including attitudes and beliefs. Subject culture refers to a trend within like-minded group, such as within a teacher’s instructional content area. In their model, Hew and Brush thought subject culture to be indirectly related to technology integration. Teachers’ attitudes and beliefs were also thought to directly influence technology integration and thought to be directly linked to their knowledge and skills.

Hew and Bush (2007) then provided recommendations for professional development that can counter attitude and belief barriers. Professional development activities consistent with the role of the technology coach were outlined as one of four strategies that must be taken into consideration in overcoming second-order attitude and belief barriers, including facilitating attitude change and facilitating teacher knowledge and skills. They called for further research to identify conditions where beliefs and knowledge become the main influence on teachers’ technology use; specifically addressing barriers that may exist in a one-to-one student to computer ratio. They identified a second call for further research regarding relationships between technology integration strategies and that there is a crucial need to further investigate specific strategies and possible relationships to subject culture. Of interest is that approximately
half of the studies Hew and Bush reviewed relied on self-reported data; similarly, approximately half of the studies were considered short-term studies.

Pan and Franklin (2011) studied the relationship between professional development, teachers’ self-efficacy, and integration of Web 2.0 tools. The authors used Web survey results from 434 K-12 teachers from across the country which seemed to reveal that Web 2.0 tools were rarely used in the classroom. According to Pan and Franklin, teachers also reported that support, training, and lack of confidence were factors in their decision not to integrate technology. Pan and Franklin also identified professional development as a predictor to playing a vital role in Web 2.0 integration.

Kopcha (2012) examined 18 elementary teachers to assess their perceptions of possible barriers to technology integration over a two-year period. The purpose of the study was to examine technology integration barriers such as lack of time, resources, and training to use instructional technology (p.1110). Kopcha conducted a survey and used a five-point Likert-type scale to measure the following barrier categories: time, beliefs, access, vision, and professional development. Through rank-order, Kopcha’s survey results revealed that despite a change in overall ratings from year one to year two, perceptions of barriers remained consistent. This consistency included perceptions of barriers in professional development. Kopcha noted that the question related to opportunity to share technological lessons with other teachers had consistently low ratings for both years. The author also identified a disconnection between available technology and teachers’ actual use of available technology within their instruction. Professional development response themes, noted by the author, included the perception that communities of practice were more challenging whereas one-to-one work with a mentor led
Subjects to feel they grew stronger. Nearly half of those Kopcha surveyed believed their mentor positively impacted their abilities to plan and implement technology-rich instruction.

This review of the literature identifies barriers to technology integration and provides recommendations for strategies that contribute to overcoming those barriers. Lack of time, resources, and learning communities were identified as potential barriers. Consistent with Hew and Brush’s (2007) recommendation, Pan and Franklin (2011) suggested future studies might consider subject culture needs for further integration of Web 2.0 tools. Pan and Franklin also identified professional development as a predictor to playing a vital role in Web 2.0 integration.

This study asks respondents to indicate which technology tools available are used in the classroom to create technology-rich learning environments. This includes Web 2.0 use. Hew and Brush (2007) also indicated needs for addressing barriers that may exist in a one-to-one student to computer ratio and investigating specific strategies and possible relationships to subject culture. The school district in this study is in year two of a one-to-one transition and groups respondents by instructional content areas to identify possible relationships between strategies and subject culture. Similar to approximately half of the studies Hew and Bush reviewed, this study relied on self-reported data and is considered a short-term study.

**Perceptions and Integration Success**

This review of the literature on perceptions and integration success intends to supply a context for measuring teachers’ perceptions in the current study. All of these studies focus on the approach of technology coaching’s affect upon teachers’ ability to deliver meaningful, technology-rich instruction.
Building upon Ottenbreit-Leftwich et al. (2010) study of teacher value beliefs associated with using technology, Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, and Sendurur (2012) may have found that a critical relationship between teacher beliefs and approaches to technology integration still exists. Eighty-six percent of schools surveyed across multiple studies claimed to employ technology support roles, serving as evidence of a reduction of barriers that have previously influenced teachers’ perceptions. According to the study by Ertmer et al. twelve kindergarten through ninth-grade teachers believed that attitudes and beliefs had the biggest impact on their success. The authors also reported that the teachers also thought that existing attitudes were barriers to successes of their peers. While historically teachers’ attitudes and beliefs towards technology integration fell within the top three most frequently recorded barriers which Ertmer et al. acknowledged, the authors posed that it may no longer prove to be true in the future. Ertmer et al. also acknowledged that professional development may have been provided in fragmented, isolated workshops with little processing time. As a result, they conjecture that both may be shifting and require further study to determine changes in approach. Ertmer et al. suggested that an increase in support, professional development, and accessibility may well be needed.

Taking a similar approach as Ottenbreit-Leftwich et al. (2010), Ertmer et al. (2012) studied primarily elementary-level teachers and drew their sample from teachers who also may have had pre-existing positive perceptions regarding technology. Data was collected by Ertmer et al. from the individual teacher’s websites and followed with interviews that sought beliefs aligning to website evidence in correlational analysis. What they found was that none were similar; no matter the role of technology, whether supplemental, enrichment, or a transformative tool; all but one of the teachers’ beliefs aligned with their practices. It did not appear to matter
how student-centered or teacher-based the level of instruction was. Additional studies might indicate if it is possible to connect teachers’ skills to professional development activities that would help them positively impact their instruction.

Kim et al. (2013) further investigated teachers’ beliefs regarding technology integration. A U.S. Department of Education-funded, four-year program provided the framework for the study. The program’s goal was to improve technology use in underperforming, rural K-8 schools, but Kim et al.’s purpose was to see if it was possible to connect teachers’ skill deficit to effective professional development activities that would help the teachers use their skills to impact their instruction. Technology integration was measured using both instructional observation and interviews. Kim et al. found a strong correlation between epistemological beliefs and conceptual beliefs; similarly, a strong correlation between conceptual beliefs and technology integration. They concluded that teachers who understood how students learn also understood how to implement effective teaching methods. Teachers who understood how to implement effective teaching methods also incorporated technology in a purposeful manner to enhance their students’ learning environment. The authors did not examine differences in technology integration practices as a result of anything other than beliefs. Furthermore, every member of their 22-teacher sample taught eighth grade or earlier.

Similar to Kim et al., Storz and Hoffman (2013) studied teachers’ perceptions at the middle school level. Interviews were conducted after a one-to-one computer initiative was implemented. Storz and Hoffman examined the interviews and found that they reinforced earlier findings that technology access changed the skill-demand that was put upon teachers but did not automatically influence teachers’ instruction toward a student-centered, technology rich approach. Storz and Hoffman found evidence supporting their hypothesis that teachers felt
changing instructional approaches and classroom management was difficult. Teachers also seemed to believe that continuing support, including parallels to the Connected Teaching Approach (NETP, 2010) such as instruction from coaches, team learning communities, and mentoring, would best meet their future needs. As in the Ottenbreit-Leftwich et al. (2010) study, interviews were performed to collect data but the teacher sample consisted of eight teachers, this time all at the middle-school level.

The current study builds upon each of these findings by offering perceptions from the high school level. Ertmer et al. (2012) acknowledged that professional development may have been provided in fragmented, isolated workshops with little processing time, so the current study considers the individual characteristics of professional development activities including duration. Similar to Hew and Brush (2007), Storz and Hoffman called for similar studies as the transition into one-to-one technological environments is the apparent direction of future education in an increasingly global, digital world. The current study is in the second year of the shift to one-to-one. This offers the unique timeliness necessary to build upon Storz and Hoffman’s (2013) examination of the early stages of the one-to-one transition. As with other reviewed studies Storz and Hoffman posit that professional development approaches will serve as a critical component of teachers’ success during the shift.

Conclusion

This review of the literature first covered studies that create a foundation for the purpose of this study. It moved on to discuss studies that addressed perceived barriers to technology coaching to understand how technology integration itself can be a barrier and provide recommendations for this study. It wrapped up with studies that intended to supply a context for measuring teachers’
perceptions of how the approaches of technology coaching affect their ability to deliver meaningful, technology-rich instruction.

As the world becomes increasingly digital, education processes will continue to grow and change in an effort to prepare students. Coaching and support roles for the digital movement must continue to emerge and evolve to meet national goals and benchmarks (ISTE, 2008; NETP, 2010) so understanding effective professional development methods will become increasingly important. Measuring the effectiveness of professional development is difficult, but it has been made certain that it is worthwhile to continue investigating this field (Desimone, 2009; Kim et al., 2013). The effectiveness of professional approaches upon teachers’ perceptions might vary due to the generation of the teacher, but this cannot be assumed to be true (NETP, 2010). Studying specific professional development activities is warranted, and may contribute insight regarding differences in perceptions of one-on-one mentoring versus a team approach (NETP, 2010; Beglau et al., 2011; Ottenbreit-Leftwich et al., 2010).

Despite a correlation between technology support roles and teachers’ beliefs regarding their technology skills, this review has shown that the secondary level seems to be an underrepresented voice (Kim et al., 2013; Kopcha, 2012; Storz & Hoffman, 2013). This study sets out to measure teachers’ perceptions of how technology coaching, specifically at the secondary level, affects their integration skills. Application of the five categories of measuring learning experiences to technology integration professional development offers a means to fill a gap in the research and offers some tested validity to implementing a survey (Desimone, 2009). Like Storz and Hoffman (2013) the district of the current study is also transitioning into one-to-one initiative; this offers unique timeliness to this study as the district’s need to identify effective approaches is only growing.
This study asks respondents to indicate which technology tools available are used in the classroom to create technology-rich learning environments. Consistent with Hew and Brush’s (2007) recommendation, Pan and Franklin (2011) suggested future studies might consider subject culture needs for further integration of Web 2.0 tools. Pan and Franklin also identified professional development as a predictor to playing a vital role in Web 2.0 integration. This study asks respondents to indicate which technology tools available are used in the classroom to create technology-rich learning environments including Web 2.0 tools. Hew and Brush also indicated a need for investigating specific strategies and possible relationships to subject culture. The current study examines subject cultures. Rather than sampling teachers who are self-identified as avid technology integrators or being limited to a small sample like Ottenbreit-Leftwich et al. (2010) and Ertmer et al (2012), the current study offers a breadth of perceptions. The current study is also unique because it focuses on perceptions from teachers at the secondary level.
CHAPTER 3. METHODOLOGY

This study intends to measure teachers’ perceptions of how technology coaching, specifically at the secondary level, affects their integration skills. Rather than sampling teachers who are self-identified as avid technology integrators, or being limited to a small sample, this study offers a breadth of perceptions from the secondary level. The school district is transitioning into a one-to-one technological environment so professional development approaches will serve as a critical component of teachers’ success during this shift. This study seeks insight into the following areas: How does technology coaching at Arrowhead Union High School affect teachers’ perceptions of their technology integration skills? What specific coaching activities contribute to their perceptions? The school sample includes teachers, support staff, and administrative stakeholders in an attempt to gain insight into factors that influence perceptions and practice of technology integration.

Research Design

This quantitative study was conducted through a web survey. Desimone (2009) found that surveys, interviews, and observations elicit very similar information as long as the study is confidential, not linked to evaluation, and framed around teachers’ actions rather than performance ratings. Similar to this study, approximately half of the 48 related professional development studies analyzed by Hew and Brush (2007) relied on self-reported data; additionally, approximately half of the studies were also considered short-term studies.

Participants

Arrowhead Union High School District, the school district sampled, is situated in the town of Hartland, WI. The district employs approximately 200 staff members to service nearly 2,250
students in grades 9-12. Freshman and sophomores attend one building, while juniors and seniors attend a second building, which is only a football field away. It is common for students and staff members to travel back and forth between buildings throughout the day, lending a collegiate feel to the campus. Arrowhead has made a commitment to innovative learning; this includes creating student-centered instruction and incorporating project-based inquiry. Arrowhead consistently strives to be a leader in educational best practices, making student achievement the top priority.

In 2012: 82% of students who took one of the 18 AP courses offered scored 3 or higher on their exam, students collectively scored in the 90th percentile in all Wisconsin Knowledge and Concepts Exam (WKCE) categories, and eight students were named National Merit finalists (Jefson, 2013). The Wisconsin Department of Instruction (2012) awarded the district an Exceeds Expectations label on their School Report Card. According to Jefson (2013), the district has recently been recognized by the College Board, Newsweek, Sports Illustrated, USA Today, Milwaukee Journal Sentinel, and Washington Post for academics, arts, and athletic programs.

The sample for this study includes all employees who are eligible for technology coaching services: administrators, support staff, student services faculty, including 120 teaching staff members. Seventy-five percent of teaching staff members have at least one master’s degree (Jefson, 2013). Library and technology literacy staff, including technology coaches, has been delimited from the sample in an effort to eliminate those who have documented pre-existing positive perceptions regarding technology integration (Ottenbreit-Leftwich et al., 2010; Ertmer et al., 2012).

Instrumentation

A web-based survey was administered at the end of the semester as a post-technology integration follow-up to collect data regarding educators’ perceptions (see Appendix D). A Google form
was the selected tool for two reasons. First, the school district committed to Google Apps for Education in the fall of 2011. Despite a lingering subscription to SelectSurvey software, teachers’ use of Google forms through district email is increasingly common practice; the intention in this study was to use a familiar medium to reduce barriers and encourage a high participation rate. Second, Google Forms allows for text, multiple choice, scale, grid, date, and time-framed questions in addition to allowing for rerouting questions based upon previous answers. Therefore, data collected will not be limited by question format types available; and, the survey can be constructed with the intention to feel as relevant and as brief as possible to participants.

Technology coaches in this study follow the cognitive coaching model; activities include modeling, planning, technology assistance, reflection, problem solving, and making clear connections between specific instruction and technology tools (Beglau et al., 2011). These activities are rooted in the theories that thought and perception produce behavior, teaching involves constant decision-making, engagement is required in new learning, and human cognitive growth never ceases (Beglau et al., 2011). Educators in the sample request which cognitive coaching activities they perceive would best help them meet their goals when requesting technology integration support. This is consistent with Desimone’s (2009) validity suggestion for framing questions around teachers’ actions, not rating performance.

Maintaining the district’s standard procedures, in the fall semester teachers filled out the “Technology Integration Request” Google Form that is available on the district webpage to receive coaching services (see Appendix C). The form asks the requestor to articulate desired student outcomes, NETS (ISTE, 2008) for teachers addressed, the coaching activity requested, conferencing availability, and desired implementation date for scheduling purposes. The
researcher was sure to maintain anonymity of this data, while paying particular attention to the types of coaching services requested, desired student outcomes, and NETS connections. Questions on the post-technology integration follow-up survey did not lead in a manner that identifies educators or threaten their anonymity in any way.

The content area screen includes: English language arts, world languages, and history (49 eligible educators); math, science, physical education, and health (39 eligible educators); arts, business education, family and consumer education, music, engineering and technology education (25 eligible educators); department chairs, administrators, and student services (17 eligible educators). Nine of these teachers also teach in an Integrated Learning Academy, where one-to-one is already implemented. Because department chairs and administrators observe classrooms, this supplies triangulation validity to instructional staff’s self-reported data and obtains a more reliable picture of technology integration culture in the district.

**Procedure**

The school district’s instructional year is divided into four nine week grading periods over two semesters. This study took place during the first semester. The IRB approval process was completed before the end of week one so that Technology Request Form data could be analyzed during week nine. The Technology Request Form was made available via the web by the end of week one so that technology integration support requests could be made to meet content-driven deadlines. Upon completion of the request form, technology coaches administered desired activities to meet educators’ goals.

The post-technology integration follow-up survey was be emailed to staff during week sixteen, which is the end of an eight day winter break (see Appendix D). Since the follow-up
survey was not a tool already used by the school district, Informed Consent (see Appendix B) was included as the first question in the participant invitation email (see Appendix A). By proceeding with the survey, consent was given. As the semester wound down, the survey was re-emailed as a reminder. Staff was able to address the email at the end of their vacation, upon return from vacation, or at the end of the semester during the week of exams when they had scheduled flexible work time.

The researcher is a technology coach and English teacher in the school district. The researcher performed coaching activities, collected data, and analyzed data. Informed consent ensured anonymity and clearly articulated that the study itself, or the decision whether or not to participate, would in no way affect colleagues’ employment, income, reputation, or professional relationship with the researcher. Wednesday of week fifteen was a scheduled early release for students where teachers typically participate in fifty minutes of connected teaching activities of their choice (NETP, 2010); the researcher used this opportunity to be available to answer questions about the survey to those interested in learning more before deciding whether or not to participate.

**Data Analysis**

Post-technology integration follow-up data was analyzed for connections between coaching activities used to meet the coaching goal and teachers’ perceptions of their ability to meet the NETS for teachers (ISTE, 2008). Department chairs, administrators, and student services are identified in one group, in addition to content category groups, which could provide opportunity to examine discrepancies or consistencies between leadership perceptions compared to instructional staff members, as well as any patterns within subject culture and coaching methods (Hew & Brush, 2007).
Trends in translation strategies and application strategies, both recommended for successful teacher transfer of instructional skills (Ottenbreit-Leftwich et al., 2010), were noted. Analysis of voluntary participation requests may provide further reflection of perceptions, as teachers might be more likely to choose to invest in activities deemed valuable and shy away from activities they do not feel support their goals (Frazier, 2011).

The study’s findings will be explicitly shared with the Professional Development team and Information and Technology department which were delimited from supplying data; results could reaffirm current best practice or call for a coaching model change. Findings may also be explicitly shared with administration and the school board, per the school district’s standard procedure upon completion of the master’s thesis. Finally, the study’s findings will be available to staff, should they choose to pursue them for follow-up for any reason.
CHAPTER 4. FINDINGS

It is important to analyze technology best practices, especially when districts invest in technology coaches to improve perceptions, actions, and abilities to meet student needs and district goals. Current and future expectations require districts to prepare students for an increasingly global, digital world (ISTE, 2008). Technology professional development approaches will serve as a critical component of a district’s success in achieving this goal. What mentoring activities intending for teachers to learn how to incorporate technology should be priority? What services do teachers find helpful in building their confidence and skill development? This study seeks insight into the effect of technology coaches upon teachers’ perceptions of their technology integration skills. It asks teachers what specific coaching activities contribute to their perceptions. It seeks to identify the future impact coaching activities might have on effective technology integration. The information gathered by this study is timely as the district transitions into a one-to-one student-to-device atmosphere.

The school sample for the study included all employees who were eligible for technology coaching services: administrators, support staff, student services faculty, including 124 teaching staff members. Maintaining district protocol, 24 staff members submitted the Technology Integration Request Form throughout the semester to receive coaching services (see Appendix C).

At the end of the semester, a web-based survey was administered as a post-technology integration follow-up to collect data regarding educators’ perceptions (see Appendix D). The survey focused upon teachers’ content and opportunities for active learning, maintained coherence, and endured a full semester (Desimone, 2009; Hew & Brush, 2007; ISTE, 2008). The survey benchmark was the National Education Technology Standards (NETS) for
coaches’ requirement to assist “teachers in using technology effectively for assessing student learning, differentiating instruction, and providing rigorous, relevant, and engaging learning experiences for all students” (Beglau et al., 2011, p.20).

**Overall Results**

The end-of-semester coaching activity follow-up survey was completed by 64 staff members. They responded to which technology integration support activities they participated in throughout the semester and, of those they participated in, which they felt advanced their abilities to integrate technology. Activities listed included lesson planning, gathering resources, problem solving, technology hardware assistance, modeling instruction, and post-integration reflection (ISTE, 2008). Staff responded on a scale of 1, the activity has little impact upon their success; to 4, the activity greatly impacts their success (Figure 1).

Sixty percent of participants responded positively to lesson planning support and 38% responded that the activity greatly impacts their success. Seventy percent of participants responded positively to gathering resources support and 37% responded that the activity greatly impacts their success. Eighty-three percent of participants responded positively to troubleshooting and 59% responded that the activity greatly impacts their success. Eighty-two percent of participants responded positively to technology hardware assistance and 35% responded that the activity greatly impacts their success. Sixty-four percent of participants responded positively to modeling instruction and 48% responded that the activity greatly impacts their success. Sixty-four percent of participants responded positively to post-integration reflection activities and 32% responded that the activity greatly impacts their success.
Figure 1. Overall perceived effectiveness of cognitive coaching activities by average.

<table>
<thead>
<tr>
<th>Score</th>
<th>Planning</th>
<th>Gathering</th>
<th>Troubleshooting</th>
<th>Technology Help</th>
<th>Modeling</th>
<th>Instruction</th>
<th>Post Reflection</th>
</tr>
</thead>
<tbody>
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<td>21</td>
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<td>35</td>
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<tr>
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<td>8</td>
<td>27%</td>
<td>4</td>
<td>7%</td>
<td>5</td>
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<tr>
<td>Total</td>
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<td>30</td>
<td>47%</td>
<td>54</td>
<td>84%</td>
<td>43</td>
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</tbody>
</table>

Table 1. Overall perceived effectiveness of cognitive coaching activities.

*Respondents only scored activities in which they participated

Staff also responded to their perception of effectiveness of two district technology integration professional development events (Figure 2) by the technology coaches where the connected teaching approach was applied (NETP, 2010). Eighty-six percent of participants responded positively to the first event with 44% indicating that the activity greatly impacts their
success. Eighty percent of participants responded positively to the second event with 40% indicating that the activity greatly impacts their success.

![Bar chart showing overall perceived effectiveness of activities using the connected teaching approach by average.](chart.png)

**Figure 2.** Overall perceived effectiveness of activities using the connected teaching approach by average.

<table>
<thead>
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<th>PCT</th>
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<tr>
<td>Total</td>
<td>45*</td>
<td>70%</td>
<td>43*</td>
<td>67%</td>
</tr>
</tbody>
</table>

**Table 2.** Overall perceived effectiveness of activities using the connected teaching approach.

*Respondents only scored activities in which they participated*
Staff indicated that they integrate technology by assessing student learning, differentiating instruction, and providing rigorous, relevant, and engaging learning experiences. To achieve this they indicated they use Web 2.0 tools, Google Apps for Education, Microsoft Office, SMARTboard software, and one-to-one device activities.

Respondents may not have participated in all of the coaching support activities available to them over the course of the semester. Responses ranged: 18% sought tech integrators’ services prior to the semester and built independence to proceed on their own, 24% received the supports they need during other scheduled group staff development activities not related to the technology coaches, 12% referred to the YouTube channel or district website for independent online support, and 29% received support from another district colleague. Seven percent of respondents stated that they were confident in meeting NETS student standards without technology coaching support. Five percent of respondents stated that meeting NETS student standards is not a priority in their classroom at this time.

**Respondent Groups**

Respondent groups were created for anonymity. English language arts, world languages, and history were grouped and included 24 respondents. Math, science, physical education, and health were grouped and included 21 respondents. Arts, business education, family and consumer education, music, and engineering and technology education were grouped and included nine respondents. Department chairs, administrators, and student services staff were grouped because they observe others and included five respondents. Those who teach English, science or social studies in an Integrated Learning Academy, where a one-to-one student to device ratio is already implemented, included five respondents.
The group with the greatest number of respondents was English language arts, world languages, and history with 24. This group responded that one of the two activities using the connected teaching approach was the most helpful to their success, but the other was found to be the least effective (Figure 3). They indicated that technology hardware assistance was second most effective in their success. Planning, gathering materials in advance, and troubleshooting were also indicated as positively impacting their success but as having less of an impact than technology help and the connected teaching activity.

<table>
<thead>
<tr>
<th>Score</th>
<th>Planning</th>
<th>Gathering Resources</th>
<th>Troubleshooting</th>
<th>Technology Help</th>
<th>Modeling Instruction</th>
<th>Post Reflection</th>
<th>PCT</th>
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<td>Total Participants</td>
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<td>88%</td>
<td>16</td>
<td>67%</td>
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</table>

*Respondents only scored activities in which they participated
Figure 3. Group 1 Perceived effectiveness of all coaching activities by average.

The second largest group of respondents was math, science, physical education, and health with 21. This group responded that troubleshooting was the most helpful to their success, and one of the activities using the connected teaching approach as second most helpful (Figure 4). This group responded that one of the two activities using the connected teaching approach was the most helpful to their success, but the other was found to be the least effective.

Troubleshooting was also indicated as positively impacting their success.

<table>
<thead>
<tr>
<th>Score</th>
<th>Planning</th>
<th>Gathering Resources</th>
<th>Troubleshooting</th>
<th>Technology Help</th>
<th>Modeling Instruction</th>
<th>Post Reflection</th>
<th>PCT</th>
<th>Hawkween</th>
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<td>33%</td>
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<td>24%</td>
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</table>

Table 4. Group 2 perceived effectiveness of all coaching activities.

*Respondents only scored activities in which they participated
Figure 4. Group 2 Perceived effectiveness of all coaching activities by average.

Elective course staff, including arts, business education, family and consumer education, music, engineering and technology education included nine respondents. The connected teaching approach activities and troubleshooting were reported as being most helpful to their success (Figure 5). Planning was ranked equally to gathering materials as least impactful upon the group’s success.

<table>
<thead>
<tr>
<th>Score</th>
<th>Planning</th>
<th>Gathering</th>
<th>Troubleshooting</th>
<th>Technology Help</th>
<th>Modeling Instruction</th>
<th>Post Reflection</th>
<th>PCT</th>
<th>Hawkween</th>
</tr>
</thead>
<tbody>
<tr>
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<td>4 44%</td>
<td>2 22%</td>
<td>3 33%</td>
<td>2 22%</td>
<td>3 33%</td>
<td>2 22%</td>
<td>2 22%</td>
</tr>
<tr>
<td>Total Participants out of 9*</td>
<td>4 44%</td>
<td>4 44%</td>
<td>8 89%</td>
<td>4 44%</td>
<td>4 44%</td>
<td>5 56%</td>
<td>7 78%</td>
<td>2 22%</td>
</tr>
</tbody>
</table>

Table 5. Group 3 perceived effectiveness of all coaching activities.

*Respondents only scored activities in which they participated
Figure 5. Group 3 Perceived effectiveness of all coaching activities by average.

Additionally, five respondents teach English, science or social studies in an Integrated Learning Academy, where a one-to-one student to device ratio is already implemented. Troubleshooting was ranked as having a strong impact upon their success (Figure 6). Technology hardware assistance was ranked as the second most impactful activity, and both modeling instruction and post-integration reflection were ranked third most impactful upon the group’s success. One connected teaching approach activity ranked as having little impact upon the group’s success.

<table>
<thead>
<tr>
<th>Score</th>
<th>Planning</th>
<th>Gathering Resources</th>
<th>Troubleshooting Help</th>
<th>Technology Instruction</th>
<th>Post Reflection</th>
<th>PCT</th>
<th>Hawkween</th>
</tr>
</thead>
<tbody>
<tr>
<td>3+4</td>
<td>1  20%</td>
<td>1  20%</td>
<td>2  40%</td>
<td>1  20%</td>
<td>0  0%</td>
<td>0  0%</td>
<td>1  20%</td>
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<td>0  0%</td>
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<tr>
<td>1</td>
<td>1  20%</td>
<td>1  20%</td>
<td>0  0%</td>
<td>0  0%</td>
<td>0  0%</td>
<td>1  20%</td>
<td>1  20%</td>
</tr>
<tr>
<td>Total</td>
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<td>2  40%</td>
<td>2  40%</td>
<td>1  20%</td>
<td>1  20%</td>
<td>1  20%</td>
<td>4  80%</td>
</tr>
</tbody>
</table>

Participants out of 5*
Table 6. Group 4 perceived effectiveness of all coaching activities.

*Respondents only scored activities in which they participated

<table>
<thead>
<tr>
<th>Integrated Learning Academy</th>
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</thead>
<tbody>
<tr>
<td>Post reflection</td>
</tr>
<tr>
<td>3.5</td>
</tr>
</tbody>
</table>

Figure 6. Group 4 Perceived effectiveness of all coaching activities by average.

Department chairs, administrators, and student services staff included five respondents. Department chairs maintain a teaching course load along with their supervisory responsibilities. The two connected teaching approach activities ranked the highest (Figure 7). Troubleshooting and gathering resources were also indicated as having a significant impact upon this group’s success. Modeling instruction and post-integration reflection ranked lowest.

<table>
<thead>
<tr>
<th>Score</th>
<th>Planning</th>
<th>Gathering Resources</th>
<th>Troubleshooting</th>
<th>Technology Help</th>
<th>Modeling Instruction</th>
<th>Post Reflection</th>
<th>PCT</th>
<th>Hawkween</th>
</tr>
</thead>
<tbody>
<tr>
<td>3+4</td>
<td>3</td>
<td>60%</td>
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<td>20%</td>
<td>2</td>
<td>40%</td>
<td>4</td>
<td>80%</td>
<td>3</td>
<td>60%</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>40%</td>
<td>1</td>
<td>20%</td>
<td>1</td>
<td>20%</td>
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<td>0%</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>0%</td>
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<tr>
<td>Total</td>
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<td>60%</td>
<td>3</td>
<td>60%</td>
<td>5</td>
<td>100%</td>
<td>4</td>
<td>80%</td>
</tr>
</tbody>
</table>

Table 7. Group 4 perceived effectiveness of all coaching activities.
*Respondents only scored activities in which they participated

**Figure 7. Group 4 Perceived effectiveness of all coaching activities by average.**

**Future Needs**

Respondents were asked how they anticipate the need for future technology integration coaching support as the district transitions into a one-to-one student-to-device atmosphere. Eighty-six percent of participants responded positively to technology hardware assistance and 51% responded that they believe future coaching support will greatly impact their success. Of the English, science or social studies staff who are also members of the Integrated Learning Academy, 100% responded positively to the impact of the need for future coaching support and 80% indicated that they believe future coaching support will greatly impact their success.

The department chair, administrators, and student services group were additionally asked how they anticipate the need for others’ future technology integration coaching support as the district transitions into a one-to-one student-to-device atmosphere. 100% of participants in this group responded positively to the impact of the need for future coaching support and 80% indicated that they believe future coaching support will greatly impact others’ success.
CHAPTER 5. DISCUSSION

This study is based on the premise that technology professional development approaches will serve as a critical component of future success in achieving student and district technology goals. Therefore it is important to analyze technology best practices that are intended to help prepare students for an increasingly global, digital world. This study represents a breadth of secondary level voices; voices left out of most previous studies. The study asks several distinct questions. What activities help secondary teachers learn how to incorporate technology? How might those activities be prioritized? Which supports do teachers find helpful in building their confidence and skill development? To begin to answer these questions this study examines the effect of technology coaches upon secondary teachers’ perceptions of their technology integration skills, recognizing specific activities effective to meeting standards. The intent is to provide insight into this previously unexamined area.

Findings and Interpretations

Overall Results

The end-of-semester follow-up survey was completed by 64 participants out of 120 eligible staff members for a 53% participation rate. They responded to which technology integration support activities they participated in throughout the semester and of those they participated in which ones they felt advanced their abilities to integrate technology. Staff responded on a scale of 1, the activity has little impact upon their success; to 4, the activity greatly impacts their success. The researcher separated the activities using the cognitive coaching method from those using the connected teaching approach.

Activities using the cognitive coaching method appear to have a balanced success rate (Figure 8). Troubleshooting and technology help were ranked as highly impacting the success of
all groups: eighty-three percent of participants responded positively to problem solving support and 59% responded that the activity greatly impacts their success; eighty-two percent of participants responded positively to technology help and 35% responded that the activity greatly impacts their success (Table 8). Both of these activities are implemented during teaching, which may indicate the high value of having a coach at hand when unanticipated needs arise.

Figure 8. Overall perceived effectiveness of cognitive coaching activities by average.

<table>
<thead>
<tr>
<th>Score</th>
<th>Planning</th>
<th>Gathering Resources</th>
<th>Troubleshooting</th>
<th>Technology Help</th>
<th>Modeling Instruction</th>
<th>Post Reflection</th>
</tr>
</thead>
<tbody>
<tr>
<td>3+4</td>
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<td>45</td>
<td>83%</td>
</tr>
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<td>4</td>
<td>12</td>
<td>38%</td>
<td>11</td>
<td>37%</td>
<td>32</td>
<td>59%</td>
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<td>12%</td>
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<td></td>
<td>8</td>
<td>24%</td>
</tr>
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<td>out of 64*</td>
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<tr>
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<td>50%</td>
<td>30</td>
<td>47%</td>
<td>54</td>
<td>84%</td>
</tr>
</tbody>
</table>

Table 8. Overall perceived effectiveness of cognitive coaching activities.

*Respondents only scored activities in which they participated
Lesson planning support and gathering resources are activities implemented before teaching, modeling instruction is implemented during teaching, and post-integration reflection is implemented after teaching. All were ranked positively by all groups, but to a lesser degree than troubleshooting and technology help. Sixty percent of participants responded positively to lesson planning support and 38% responded that the activity greatly impacts their success; seventy percent of participants responded positively to gathering resources support and 37% responded that the activity greatly impacts their success; sixty-four percent of participants responded positively to modeling instruction and 48% responded that the activity greatly impacts their success; sixty-four percent of participants responded positively to post-integration reflection activities and 32% responded that the activity greatly impacts their success. In order to analyze the data more thoroughly, each respondent group was be broken down to identify potential discrepancies in subject culture.

The National Education Technology Plan (NETP, 2010) identified technology as a focus area and, as a result, made a goal that by 2015 both team and individual support would bring empowering and inspiring experiences to teachers to improve their teaching. Five percent of respondents stated that meeting NETS student standards is not a priority in their classroom at this time. Given that student standards in this area are a goal and a requirement, the importance of meeting these standards will need to be re-emphasized. Frazier (2011) suggested that analysis of voluntary participation requests may provide further reflection of perceptions, as teachers might be more likely to choose to invest in activities deemed valuable and shy away from activities they do not feel support their goals. All of the coaching activities in this study were optional; despite bringing the experiences to teachers, they still have to see the value in the experiences to elect to participate in them.
Staff also responded to questions about their perception of effectiveness of two district technology integration professional development events (Figure 9) by the technology coaches where the connected teaching approach was applied (NETP, 2010). Eighty-six percent of participants responded positively to the first event with 44% indicating that the activity greatly impacts their success (Table 9). Eighty percent of participants responded positively to the second event with 40% indicating that the activity greatly impacts their success. Both activities used the same approach, yet Hawkween ranked higher than PCT. Hawkween is a part of an annual, all-day, all-staff professional development day. PCT is a part of ongoing professional development weekly support at the end of a regular school day. PCT is designed to allow teachers to use their learning networks to continuously build skills until they develop a certain level of expertise (NETP, 2010). Each activity had more than 40 participants with over 80% ratings for positive impact upon success. This could show that the connected teaching approach is effective.

![Figure 9. Overall perceived effectiveness of activities using the connected teaching approach by average.](image)
<table>
<thead>
<tr>
<th>Score</th>
<th>Hawkween</th>
<th>PCT</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td></td>
<td>9%</td>
<td>9%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>45*</td>
<td>43*</td>
</tr>
<tr>
<td></td>
<td>70%</td>
<td>67%</td>
</tr>
</tbody>
</table>

Table 9. Overall perceived effectiveness of activities using the connected teaching approach.

*Respondents only scored activities in which they participated

NETP’s (2010) connected teaching approach appears to be successful, but the cognitive coaching method (Beglau et al., 2011) also suggests success; combined, the two approaches had four activities rated as positively impacting teachers’ success by 80% or more respondents. In this study, eighteen percent of respondents sought tech integrators' services prior to the semester and built independence to proceed on their own and twelve percent referred to the YouTube channel or district website for independent online support. This study’s data appears to support the approach of Ottenbreit-Leftwich et al. (2010) whose sample identified award winning technology integrators who valued the connection between technology usage and student engagement. This may support the idea that expertise can lead to independence and confidence. Seven percent of respondents in the current stated that they were confident in meeting NETS student standards without further technology coaching support. Only one teacher in the Ottenbreit-Leftwich et al. sample was from the high school level but in the current study the sample was represented entirely by the high school level.
Respondent Groups

Hew and Brush (2007) identified a knowledge gap regarding relationships between technology integration strategies and a crucial need to further investigate specific strategies and possible relationships to subject culture. In order to build on Hew and Brush this study separately analyzed each respondent group to identify potential discrepancies in subject culture.

Group 1 had greatest number of respondents with a 50% participation rate. This group included 24 teachers in the English language arts, world languages, and history (Table 10). The overall effectiveness of each activity was positive, yet varied.

<table>
<thead>
<tr>
<th>Score</th>
<th>Planning</th>
<th>Gathering Resources</th>
<th>Troubleshooting</th>
<th>Technology Help</th>
<th>Modeling Instruction</th>
<th>Post Reflection</th>
<th>PCT</th>
<th>Hawkween</th>
</tr>
</thead>
<tbody>
<tr>
<td>3+4</td>
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<td>50%</td>
<td>16</td>
<td>67%</td>
<td>15</td>
<td>63%</td>
<td>11</td>
<td>45%</td>
</tr>
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<td>17%</td>
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<td>4%</td>
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<td>50%</td>
<td>21</td>
<td>88%</td>
<td>16</td>
<td>67%</td>
</tr>
</tbody>
</table>

Table 10. Group 1 perceived effectiveness of all coaching activities.

*Respondents only scored activities in which they participated

These teachers indicated that troubleshooting was most effective and technology hardware assistance was second most effective in their success (Figure 10).
Figure 10. *Group 1 Perceived effectiveness of all coaching activities by average.*

Planning, gathering materials in advance, and troubleshooting were also indicated as positively impacting their success but as having less of an impact as technology help and the connected teaching activity. They responded that one of the two activities using the connected teaching approach was the most helpful to their success, but the other was found to be the least effective.

Results for this group of teachers could be influenced by the content background of the technology coach who administers the PCT. The coach is also an English teacher serving a dual role. Subject knowledge could be reflected through examples that could influence this group to perceive activities as more relevant or more successful. Activities conducted before teaching, during teaching, after teaching, or using the connected teaching approach, all are scored as positively impacting group members’ ability to create a technology-rich learning environment. This suggests that this varied approach to technology professional development should be continued for these teachers by the technology coaches.

Group 2 had the second greatest number of respondents and a 54% participation rate. This group included 21 teachers in math, science, physical education, and health (Table 11). The overall effectiveness of each coaching activity was positive and consistent.
Table 11. Group 2 perceived effectiveness of all coaching activities.

*Respondents only scored activities in which they participated

Results for this group of teachers could be influenced by the content background of the technology coach who administers the PCT. The coach is also a math teacher serving a dual role. Subject knowledge could be reflected through examples that could influence this group to perceive activities as more relevant or more successful.

Hawkween, the other connected teaching approach activity, was the second most effective with these teachers (Figure 11).
This was the same activity indicated as the least effective for the English language arts, world languages, and history teachers (Figure 10). Troubleshooting was ranked similarly for both groups, but these teachers responded that troubleshooting was the most helpful to their success.

There may be a possible correlation indicated between planning ahead and the need for impromptu support: activities implemented before teaching, such as lesson planning, ranked lowest and the need for on-the-spot help, troubleshooting, ranked highest.

Group 3 had a 36% participation rate. This group included elective course staff including arts, business education, family and consumer education, music, engineering and technology education teachers with nine respondents (Table 12).

<table>
<thead>
<tr>
<th>Score</th>
<th>Planning</th>
<th>Gathering Resources</th>
<th>Troubleshooting</th>
<th>Technology Help</th>
<th>Modeling Instruction</th>
<th>Post Reflection</th>
<th>PCT</th>
<th>Hawkweed</th>
</tr>
</thead>
<tbody>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td>4 44%</td>
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<td>0 0%</td>
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</tr>
<tr>
<td>1</td>
<td>4 44%</td>
<td>4 44%</td>
<td>2 22%</td>
<td>3 33%</td>
<td>2 22%</td>
<td>3 33%</td>
<td>2 22%</td>
<td>2 22%</td>
</tr>
<tr>
<td>Total</td>
<td>4 44%</td>
<td>4 44%</td>
<td>8 89%</td>
<td>4 44%</td>
<td>4 44%</td>
<td>5 56%</td>
<td>7 78%</td>
<td>2 22%</td>
</tr>
<tr>
<td>Participants out of 9*</td>
<td>4 44%</td>
<td>4 44%</td>
<td>8 89%</td>
<td>4 44%</td>
<td>4 44%</td>
<td>5 56%</td>
<td>7 78%</td>
<td>2 22%</td>
</tr>
</tbody>
</table>

*Respondents only scored activities in which they participated

The overall effectiveness of each individual coaching activity was positive, with the exception of gathering materials and planning (Figure 12). Gathering materials is an activity that is completed before the learning activity takes place. The only other activity completed before the learning activity takes place, planning, was ranked equally to gathering materials as least impactful upon the group’s success.
Despite a high ranking from the English language arts, world languages, and history teachers, gathering materials was ranked least impactful upon the success of teachers in Group 3. This could be the result of the nature of the content area rather than the coaching activity. The effectiveness of both connected teaching approach activities were positive; these activities were ranked most effective for this group, followed by troubleshooting through roadblocks that spring up.

Group 4 was comprised of teachers in the Integrated Learning Academy, where a one-to-one student to device ratio is already implemented. This group includes those who teach English, science and social studies. Five out of nine eligible educators responded for a 56% participation rate (Table 13). The overall effectiveness of each activity was varied for this group. Troubleshooting was ranked as having a strong impact upon their success, and exceeded all other coaching activities for this group (Figure 13). Technology hardware assistance was ranked as the second most impactful activity, and both modeling instruction and post-integration reflection were ranked as third most impactful upon the group’s success.
Table 13. Group 4 perceived effectiveness of all coaching activities.

*Respondents only scored activities in which they participated

Despite high ranking from the other groups, and earning the highest possible rank for impact upon success by department chairs, administrators, and student services, one of the two connected teaching approach activities ranked low. Yet, the effectiveness of the other connected teaching approach activity ranked similarly as effective by English language arts, world languages, history instructors and the Integrated Learning Academy teachers. All nine eligible members of this group could have identified with their content area rather than with their
Integrated Learning Academy duties. Four members did this, so it is possible that Integrated Learning Academy subject culture has influenced the results of other groups.

Groups 1, 2, 3 and 4 are 100% comprised of teaching staff. Subject culture was identified within teaching groups and may provide insight to an overall trend related to timing of coaching activities. Activities before instruction include planning and gathering materials. Activities during instruction including trouble-shooting and technology help. In the overall results, activities during instruction were ranked almost 20% higher overall compared to coaching support activities before instruction. In the individual respondent group breakdown, the value of coaching support activities before instruction varied. Therefore subject culture does not appear to support that participating in planning activities before instruction reduces the need for coaching support troubleshooting or help during teaching.

Department chairs, administrators, and student services staff included five respondents out of 17 eligible educators, for a 29% participation rate (Table 14).

<table>
<thead>
<tr>
<th>Score</th>
<th>Planning</th>
<th>Gathering Resources</th>
<th>Trouble-shooting</th>
<th>Technology Help</th>
<th>Modeling Instruction</th>
<th>Post Reflection</th>
<th>PCT</th>
<th>Hawkweed</th>
</tr>
</thead>
<tbody>
<tr>
<td>3+4</td>
<td>3 60%</td>
<td>3 60%</td>
<td>5 100%</td>
<td>3 60%</td>
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<td>5 100%</td>
</tr>
<tr>
<td>4</td>
<td>1 20%</td>
<td>2 40%</td>
<td>4 80%</td>
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Table 14. Group 5 perceived effectiveness of all coaching activities.

*Respondents only scored activities in which they participated
It should be noted that 10 of the 17 eligible members of this group could have identified with their content area rather than with their administrative duties because department chairs maintain a teaching course load along with their supervisory responsibilities.

The effectiveness of each coaching activity was positive and consistent. Both connected teaching approach activities ranked the highest, with one receiving a perfect ranking for strongly impacting success from all members of the group (Figure 14). This group lessened the gap between activities conducted before teaching and support during teaching: troubleshooting was ranked consistently with the other groups as having a strong impact upon success, but gathering resources was also indicated as having a significant impact upon this group’s success. Modeling instruction and post-integration reflection ranked lowest for this group, yet still high compared to the other groups.

![Figure 14. Group 5 Perceived effectiveness of all coaching activities by average.](image)

Frazier (2011) offered evidence that coaching is a likely factor in improving teachers’ comfort levels and practice. Similarly, Hew and Brush (2007) suggested that teachers’ attitudes and beliefs are thought to directly influence their integration and thought to be directly linked to their knowledge and skills. Group 5 data allows for a more reliable picture of technology
integration culture in the district, since successful professional development activities should correlate with tangible results. In the current study department chairs and administrators observe classrooms. This allows them to supply triangulation data to validate instructional staff’s self-reported use of technology in the classroom.

This study asked respondents to indicate which technology tools are used in the classroom to create technology-rich learning environments because it is believed that clear evidence of teachers implementing what they learn is a key indicator of professional development success (Beglau et al., 2011, p.6). Groups 1, 2, 3, and 4 indicated what they use in their classroom and Group 5 indicated what they see being used in classrooms during their observations (Figure 15).

![Bar chart](image)

*Figure 15. Self-reported use of technology compared to classroom observation, by percent.*

Pan and Franklin (2011) identified professional development as a predictor to playing a vital role in Web 2.0 integration. Respondents indicated that they integrate technology by assessing student learning, differentiating instruction, and providing rigorous, relevant, and
engaging learning experiences. To create this type of learning experience, they indicated they use Web 2.0 tools, Google Apps for Education, Microsoft Office, SMARTboard software, and one-to-one activities. Similarly, department chairs and administrators responded that they have observed each of these activities’ implementation into creating technology-rich learning environments for students. More administrators recognized observing one-to-one teaching activities and SMARTboard use than teaching respondents. These results could be influenced by the fact that observers reflected upon staff that chose not to participate in this study; it may also be a reflection of how participants of this study define their teaching and learning activities.

**Future Needs**

Frazier (2011) sought to understand how peer coaching affects teachers’ comfort, instructional practices, and implications of the coaching on student achievement. Frazier’s sample of 13 sixth grade teachers was selected because of their perceived strong leadership skills rather than technology skill level. They were trained to be successful technology coaches because they were leaders. Consistent with Frasier, the current study suggests a positive relationship between non-technology coaching staff assuming leadership roles once they gain confidence and independence using instructional technology. Twenty-four percent of participants in the current study responded that they receive the supports they need during other scheduled group staff development activities not related to the technology coaches. Twenty-nine percent responded that they receive technology supports from another district colleague.

Nearly 50% of the 18 elementary level teachers Kopcha (2012) surveyed believed their mentor positively impacted their abilities to plan and implement technology-rich instruction. Respondents of the current study were asked how they anticipate the need for future technology
integration coaching support as the district transitions into a one-to-one atmosphere. Eighty-six percent of participants responded positively to technology hardware assistance and 51% responded that they believe future coaching support will greatly impact their success. This supports the theme found by Kopcha (2012) that one-on-one work with a mentor may cause subjects to feel they grow stronger in their abilities, even though one focuses on primary levels and the other on secondary. Of the English, science and social studies staff who are also members of the Integrated Learning Academy, where a one-to-one environment is already implemented, 100% responded positively to the impact of the need for future coaching support and 80% responded that they believe future coaching support will greatly impact their success.

Because they observe others, respondents in the department chair, administrators, and student services staff member group were additionally asked how they anticipate the need for others’ future technology integration coaching support as the district transitions into a one-to-one student-to-device atmosphere. One hundred percent of participants in this group responded positively to the impact of the need for future coaching support and 80% responded that they believe future coaching support will greatly impact others’ success.

**Conclusion**

This quantitative study was used to measure teachers’ perceptions of specific technology coaching strategies that are successful in helping teachers increase their ability to create technology-rich learning environments for their students. The benchmark was the National Education Technology Standards (NETS) for coaches’ requirement to assist “teachers in using technology effectively for assessing student learning, differentiating instruction, and providing rigorous, relevant, and engaging learning experiences for all students” (Beglau et al., 2011, p.20).
The demographics of this study are unique compared to the literature. Rather than sampling teachers who are self-identified as avid technology integrators, or being limited to a small sample, this study offers a breadth of perceptions from the secondary level. The results were analyzed for connections between specific methods used to meet the coaching goal and teachers’ perceptions of their ability to meet two goals of NETS for teachers (ISTE, 2008) related to facilitating and inspiring student learning and creativity and designing and developing digital age learning experiences and assessments.

A trend was found in perceived success from troubleshooting and technology help activities. Both interventions were ranked as highly impacting the success of all groups: eighty-three percent of participants responded positively to problem solving support and 59% responded that the activity greatly impacts their success; eighty-two percent of participants responded positively to technology help and 35% responded that the activity greatly impacts their success. Both of these activities are implemented during teaching, which may suggest that both mentoring activities are worthwhile moving forward because teachers find them helpful in building their confidence and skill development. For these reasons, these two interventions should continue to be a priority for staff implementation.

English language arts, world languages and history teachers scored activities conducted before teaching, during teaching, after teaching, or using the connected teaching approach all as positively impacting their ability to create a technology-rich learning environment. This suggests that all activities should be continued for this group of teachers by the technology coaches as a balanced approach to technology professional development. Subject culture does not appear to support that participating in planning activities before instruction reduces the need
for coaching support during teaching. Additional studies might clarify whether or not there is a connection between the two.

Subject knowledge between the technology coaches and the learner may also impact perception of integration success. There is a possible trend that coaches from the same field may be beneficial. One coach is also a math teacher and the other is an English language arts teacher serving dual roles. Results for Group 1 which included English language arts, world languages and history teachers, and Group 2 which included math, science, physical education, and health teachers could be influenced by the content background of the technology coach who administers the PCT activity. Subject knowledge could be reflected through examples that could influence this group to perceive individual activities as more relevant or more successful. This perceived relevance could also contribute to Group 1 and Group 2 having the highest numbers of total respondents in the study.

The sample for this study included all employees who were eligible for technology coaching services: administrators, support staff, student services and teaching faculty, including 124 staff members. The end-of-semester follow-up survey was completed by approximately half of eligible staff members, so the results may not be indicative of district-wide technology integration culture. All of the coaching activities in this study were optional; despite providing learning experiences to staff, they still have to see value in the experiences to elect to participate in them. Maintaining district protocol, 24 staff members elected to submit a Technology Integration Request Form to participate in coaching services, which solidifies that those teachers connected desired student outcomes and NETS before instruction and suggests that they saw value in the experiences. However five percent of respondents stated that meeting NETS student standards is not a priority in their classroom at this time. Given that student standards in this area
support a national goal and are a district requirement, the importance of meeting these standards to create technology-rich learning environments will need to be re-emphasized.

This study has attempted to lay out an argument for how technology professional development approaches will serve as a critical component of future success in achieving student and district goals. This study built on previous studies but also tried to focus on the secondary level. Its findings suggest that activities during teaching, especially troubleshooting and technology help, positively impact secondary teachers’ perception of their ability to incorporate technology-rich learning environments at high levels. Based on the findings the following recommendations are made:

1. The study suggests that technology coaching activities should be prioritized.

2. It is recommended that technology coaches continue to use a balanced approach in their coaching activities and use both the cognitive coaching model and connected teaching approach.

3. It is also recommended they continue to transfer technology skills to other staff members with strong leadership qualities to reach those who did not participate in all activities or who did not respond to the survey.

4. It is recommended that the importance of meeting technology standards for providing rigorous, relevant and engaging learning experiences be re-emphasized.

The school district is transitioning into a one-to-one environment, so professional development approaches will serve as a critical component of teachers’ success during this shift. Applying the findings from this study may help teachers not only survive the learning curve of the digital shift, but embrace technology so that they can improve their instructional methods to
create technology-rich learning environments for their students and prepare them for an increasingly digital world.

This study attempted to expand our professional understanding about how best to utilize interventions for increasing teacher proficiency with technology. It did not look into how these interventions impacted students; instead it examined teachers’ perceived preferences and experience with two separate approaches of coaching support before, during, and after instruction. Unlike previous studies that focused on self-identified avid technology integrators, this study examined a breadth of perceptions from the high school level. This expands the work of Kim et al. (2013), Kopcha (2012), and Storz and Hoffman (2013) who found a correlation between technology support roles and teachers’ beliefs regarding their technology skills at elementary and middle levels. This study was also conducted during the unique transition into a one-to-one district environment which expands upon Storz and Hoffman’s (2013) study during the transition to a one-to-one environment. Basic conclusions indicate that technology coaching activities have a positive impact on teachers’ perceptions to create technology-rich learning environments. It is specifically recommended that for the best results at the high school level districts might support technology coaches in prioritizing activities while using a balanced approach, transferring technology skills to staff members with leadership qualities, and reemphasizing district technology goals.
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http://www.iste.org/standards/nets-for-teachers

http://www.arrowheadschools.org/about/superintendent.cfm


APPENDIX A. PARTICIPANT INVITATION

Dear Arrowhead Colleague:

I am inviting you to participate in the research study for my Master’s thesis at the University of Wisconsin-Superior. This study is designed to investigate technology integration needs of Arrowhead educators and the technology coaching strategies that may effectively address those needs.

You were selected to participate in this study because you are eligible to receive technology coaching services at Arrowhead. You are ensured anonymity. The study itself, and the decision whether or not to participate, will in no way affect your employment, income, reputation, or professional relationship with the researcher. You are in no way rating the technology coaches. This study is designed solely to investigate what research-based activities work to meet your needs at Arrowhead right now.

If you are willing to participate in this study, please fill out the one-question Informed Consent Form that accompanies this invitation. I appreciate your time and thank you for your consideration. If you have any questions, concerns, or comments, please feel free to contact me at either my home or work emails, which are listed below. I have also listed my thesis advisor’s contact information.

Thank you, again, for your time and consideration.

Stephanie (Janigo) Polkowski
Personal: stephjanigo@gmail.com
Work: polkowski@arrowheadschools.org

My Thesis Advisor:
Suzanne Griffith, PhD
Educational Leadership Department
University of Wisconsin-Superior
sgriffit@uwsuper.edu
(715) 394-8316
APPENDIX B. INFORMED CONSENT FORM

To Research Study Participant:

*Please read this consent form carefully before you decide whether or not to participate in this research study. You are free to ask questions at any time. The researcher’s contact information is listed below.*

**Title of Research Project**
*Technology Coaching and Integration: Teachers’ Perceptions of Successful Strategies*

**Reason for Conducting Research**
The purpose of this study is to investigate technology integration needs of secondary teachers and the technology coaching strategies that may effectively address those needs.

**Participant Selection**
You were selected to participate in this study because you are eligible for technology integration coaching services at Arrowhead Union High School.

**Participant Responsibilities and Length of Study**
After returning your consent to participate in the study, you will receive a web-questionnaire via email asking for input on which coaching activities helped meet your instructional needs of integrating technology into your instruction. It is estimated that this questionnaire will take 5-10 minutes to complete. The web-questionnaire will be sent to you toward the end of first semester, between weeks fifteen and sixteen.

Even if you do not seek out technology coaching services, your participation holds great value in this study!

**Confidentiality**
Your identity and participation in this study will be confidential and anonymous. While the identity of those seeking technology coaching services will be known by the researcher so that services can be administered, identities of the follow-up survey will be completely anonymous. The results of the study, including any data, may be published for scientific purposes but will not give your name or include any identifiable references to you. At the most, individual responses will be written as: “one participant used…” or “several participants believed…” All data and records will be kept private as permitted by law.

**Benefits and Risks to the Participant**
No compensation is provided to study participants. There are no identifiable risks to those who participate in this study. Participants are ensured anonymity. The study itself, and the decision
whether or not to participate, will in no way affect participants’ employment, income, reputation, or professional relationship with the researcher.

**Voluntary Participation**
Participation in this study is voluntary and greatly appreciated. You have the right to withdraw from the study at any time without consequence. To participate in this study, please click on the link below (or copy-paste into your browser) to complete the agreement section. Your Arrowhead username will be recorded on the authorization form to serve as your legal signature for this study.

**Research Study Contact Information**
Researcher
Stephanie (Janigo) Polkowski
(Personal) stephjanigo@gmail.com
(Work) polkowski@arrowheadschools.org
262-369-3611, extension 3164

Researcher’s Masters Advisor
Suzanne Griffith, PhD
Educational Leadership Department
University of Wisconsin-Superior
sgriffit@uwsuper.edu

**Research Study Authorization**
Please submit your response to one-question at [http://tinyurl.com/AHSAuthorization](http://tinyurl.com/AHSAuthorization) to voluntarily participate in this study.
APPENDIX C. TECHNOLOGY INTEGRATION REQUEST FORM

The technology integration coaching request form must be completed in advance to receive services from the Arrowhead technology coaches. This has been protocol since September, 2012. The form can be found at: http://tinyurl.com/AHStechrequest. The form is also linked to the “Library & Tech” page of the Arrowhead district webpage under Technology Integration.
APPENDIX D. POST TECHNOLOGY INTEGRATION FOLLOW-UP

This twelve-to-fourteen question survey is anticipated to take between 5-10 minutes of your time. Your Arrowhead username is not being recorded, your responses are anonymous, and your answers will be confidential. Your responses along with other participants’ responses will be reported in an aggregate format. For your response to be used in the study, you must respond and submit the survey by January 10, 2014. Thank you for your participation.

Technology integration coaching goal:
To help Arrowhead educators advance their ability to use technology effectively for assessing student learning, differentiating instruction, and providing rigorous, relevant, and engaging learning experiences for all students.

Of the technology coaching activities you participated in this semester, which do you feel advanced your ability to use technology effectively for assessing student learning, differentiating instruction, and providing rigorous, relevant, and engaging learning experiences for all students?

1. Lesson Planning (choose one)
   N/A - Did not participate in this activity
   1 Little Impact on Success
   2
   3
   4 Greatly Impacts Success

2. Gathering Resources (choose one)
   N/A - Did not participate in this activity
   1 Little Impact on Success
   2
   3
   4 Greatly Impacts Success

3. Problem Solving or “Just in Time” Troubleshooting (choose one)
   N/A - Did not participate in this activity
   1 Little Impact on Success
   2
   3
   4 Greatly Impacts Success

4. Technology Assistance or SMARTboard help (choose one)
   N/A - Did not participate in this activity
   1 Little Impact on Success
2
3
4 Greatly Impacts Success

5. Modeling Instruction or Teaching a Lesson (choose one)
   
   N/A - Did not participate in this activity
   1 Little Impact on Success
   2
   3
   4 Greatly Impacts Success

6. Post-integration Reflection (choose one)
   
   N/A - Did not participate in this activity
   1 Little Impact on Success
   2
   3
   4 Greatly Impacts Success

7. Wednesday Tech PCTs (choose one)
   
   N/A - Did not participate in this activity
   1 Little Impact on Success
   2
   3
   4 Greatly Impacts Success

8. Technology-related Hawktoberfest snapshots (choose one)
   
   N/A - Did not participate in this activity
   1 Little Impact on Success
   2
   3
   4 Greatly Impacts Success

9. Other: _____________ (non-required question)
   
   N/A - Did not participate in other activities
   1 Little Impact on Success
   2
   3
   4 Greatly Impacts Success

If you answered “N/A - Did not participate in this activity” for any of the above, which are appropriate?
(please check all that apply)

   a. I sought coaching services prior to this semester and built independence to proceed on my own

   b. I receive the supports I need via Wednesday PCT time or other scheduled group professional development activities
c. I refer to the tech@arrowheadschools.org YouTube channel or Arrowhead sites for independent online-support

d. I received support from another Arrowhead colleague

e. I am confident in meeting National Education Technology Standards (NETS) without coaching support

f. Meeting NETS is not a priority in my classroom at this time

g. Other

10. I use technology effectively for assessing student learning, differentiating instruction, and providing rigorous, relevant, and engaging learning experiences using: (check all that apply)

a. Web 2.0 tools [Prezi, Glogster, infographics, etc.]

b. Web 3.0 tools [Anytime, anywhere: Twitter, blogging, etc.]

c. Google Apps for Education [Docs, Forms, Presentations, etc.]

d. Microsoft Office Applications [Excel, PowerPoint, etc.]

e. SMART software

f. 1:1 activities [Student-to-device ratio]

g. Other

11. As Arrowhead transitions into a 1:1 student-to-device atmosphere, how do you anticipate it might affect future technology integration coaching support needs?

N/A - I do not feel this will apply to my classroom.

1 Anticipate Very Little Need

2

3

4 Anticipate Great Need

12. My content area is best described as:

a. Department chair, administration, or student services

b. Integrated Learning Academy (ILA)

c. English language arts, world languages, or history

d. Math, science, physical education, or health

e. Arts, business education, family and consumer education, music, engineering or technology education

If you chose “a. Department chair, administration, or student services” which to you feel are true to your observations?

13. Arrowhead teachers use technology effectively for assessing student learning, differentiating instruction, and providing rigorous, relevant, and engaging learning experiences using: (check all that apply)

a. Web 2.0 tools [Prezi, Glogster, infographics, etc.]

b. Web 3.0 tools [Anytime, anywhere: Twitter, blogging, etc.]

c. Google Apps for Education [Docs, Forms, Presentations, etc.]

d. Microsoft Office Applications [Excel, PowerPoint, etc.]

e. SMART software
f. 1:1 activities [Student-to-device ratio]
g. Other

14. As Arrowhead transitions into a 1:1 student-to-device atmosphere, how do you anticipate it might affect future technology integration coaching support needs?
   N/A - I do not feel this will apply to those I observe.
   1 Anticipate Very Little Need
   2
   3
   4 Anticipate Great Need