EXPLORING THE CONTEXTUAL FACTORS RELATED TO TRANSFER OF LEARNING IN A HIGH SCHOOL IMPLEMENTATION OF THE EMINTS PROGRAM

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IMPLEMENTATION OF THE EMINTS PROGRAM

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Dedication

This dissertation is dedicated to my incredibly understanding and loving family who always told me I was capable of doing anything I set my mind to. This achievement would not have been possible without Michael’s unwavering patience and support.

Michael and Grant, thank you for always believing in me! Thanks also to my parents for cheering me on all along the way.

I also want to thank my friends and colleagues for their support and assistance in this process. Thanks especially to Christie, Marta, and David for all their encouragement, moral support, babysitting, and everything else they did to keep me going and make it possible for me to reach the finish line.
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I would also like to express my sincere appreciation for all the teachers and administrators who willingly shared their time and experiences with me. It was a true pleasure spending time at their school and in their classrooms. I wish them continued success with the eMINTS Program and in all their endeavors in the future.
Abstract

Truly impacting teacher practices is a challenge for educational professional development (PD) providers. Typically, little attention is paid to the factors within the environment to which the educators return and how those factors will impact participants’ ability to integrate what they have learned into their teaching practices. Even for successful PD programs like the eMINTS (enhancing Missouri’s Instructional Networked Teaching Strategies) Program, more information about the relationship between transfer and school contextual factors can prove useful.

This study used a single case study design, with primarily qualitative methods, to explore the relationship between transfer of learning and the contextual factors in a high school implementation of the eMINTS Program. The primary goal of the eMINTS PD Program is to have teachers integrate technology and student-centered, inquiry-based instructional strategies into their classroom practices. Data collection methods included an online questionnaire, in-depth participant interviews, classroom observations, and document and artifact analysis. The findings suggest that a wide variety of contextual factors were indeed related positively and negatively to teacher transfer of learning at the high school level. A variety of barriers were identified such as structural and curriculum constraints, technology challenges, and varying degrees of teacher comfort with the more student-centered instructional strategies. However, in this particular case, the factors which helped facilitate teachers’ use of the eMINTS instructional strategies appeared to significantly outweigh the barriers; the primary enhancers included exceptional leadership, a highly collaborative work culture, and strong technology support.
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Chapter 1: Introduction and Overview of Study

Truly impacting teacher practices is a challenge for educational professional development (PD) providers. PD providers often spend significant time adjusting the content and format of their workshops and programs to increase the chance that what is being taught is actually learned and implemented. However, much less attention is paid to the factors within the environment to which the educators return and how those factors may impact participants’ ability to integrate what they have learned into their teaching practices. These contextual factors, such as school culture and leadership, often have a tremendous influence on whether or not this transfer of learning actually occurs (Saks & Belcourt, 2006). Even for successful PD programs like the eMINTS (enhancing Missouri’s Instructional Networked Teaching Strategies) Program that have been shown to have a significant positive impact on teaching practices and student achievement (Martin, Strother, Beglau, Bates, & Reitzes, 2010; Meyers & Brandt, 2010), more information about the relationship between transfer and the contextual factors could prove useful in raising the level of success of future implementations.

Without a clear understanding of how these contextual factors are related to the transfer process or how some of the barriers in the environment might be minimized or removed, professional development providers are missing an enormous opportunity to help schools achieve the desired changes in teaching practices. Given the benefit of such knowledge, PD providers could not only offer content to teachers but consult with the school faculty and administration on other changes they may want to make in the school setting to increase the rate of adoption in the classroom. Furthermore, prior to making the
decision to invest time and money into the PD program, school leaders may be able to assess the true readiness of the school to embark on such a journey, and perhaps spend time on establishing a more fertile environment for school change prior to the embarking on a school reform effort. The eMINTS Program in particular is a two-year professional development program which requires that a school commit a significant investment of time and resources with the goal of effectively integrating technology and inquiry-based instructional practices (Meyers & Brandt, 2010). Prior to starting an eMINTS implementation, it would behoove a district leadership to gain an understanding of what kinds of contextual factors help or hinder the level of adoption of the eMINTS teaching strategies and technology integration; this knowledge could be used to find ways to actively remove barriers, put drivers in place, and increase the district’s overall chance of success.

The high school setting in particular is a newer implementation setting for the eMINTS Program. While eMINTS classrooms have existed in the elementary grades for over a decade, eMINTS classrooms at the secondary level have been a more recent development. The number of eMINTS classrooms at the high school level is even more limited than it is at the middle school and junior high levels. Whole-school eMINTS implementations in high school only exist in a handful of districts in Missouri.

The need to better understand the how eMINTS can be implemented in the high school environment is critical. How well the eMINTS PD materials and sessions currently match the needs of high school teachers in implementing inquiry-based lessons in a technology-rich classroom is still relatively unknown. A clear understanding of the unique challenges of collaboration and developing interdisciplinary lessons among
teachers who each specialize in their own content areas is still largely a mystery. Therefore, conducting an in-depth case study at a high school which has successfully and comprehensively integrated the eMINTS PD Program could offer valuable insights to other schools and to the eMINTS Program staff.

**Research Problem and Purpose**

Ensuring that students receive high-quality instruction and the skills that they will need to be successful adults is a major concern for all U.S. schools. The question of which factors affect the successful integration of technology into the classroom has not been extensively or adequately studied (Lawless & Pellegrino, 2007; Cuban, 2001). Even less is known about this process at the high school level. The purpose of this study is to examine one high school (referred to by the pseudonym: Owenville High School) as a single case study in order to gain insight into how contextual factors were related to the teachers' transfer of learning process as they attempted to integrate the eMINTS teaching strategies into their classroom practices. Through this in-depth look at one particular high school setting, this study will attempt to illuminate the various factors, with special emphasis on work environment factors such as leadership support and organizational culture, which helped or hindered the transfer of learning of the teachers. Insofar as other schools have similar contexts and characteristics, the findings of this study may help future attempts to develop technology-rich high school classrooms that integrate inquiry-based, student-centered instruction.

**Research Question**
The following research question was addressed: What factors enhanced or hindered teachers’ transfer of learning in the eMINTS Program implementation at Owenville High School?

**Conceptual Framework**

This study was guided by the major concepts from the transfer of learning literature. While this literature acted as the major lens of this study, the researcher remained open to any additional discoveries that revealed themselves through the research process.

Transfer of learning has been a subject of interest for decades, originally in the realm of instructional design and education, and more recently in the field of cognitive psychology (Haskell, 2001). Transfer of training, a subset of the broader transfer of learning literature, has been of special interest to businesses and other organizations that invest billions of dollars annually into professional development for employees in the hopes of improving organizational performance (Baldwin, Ford, & Blume, 2009). Essentially transfer of training refers to the application of knowledge and skills that have been introduced through a learning experience to the job context. Therefore, transfer is the generalization and maintenance of those skills over a period of time in the work setting (Baldwin & Ford, 1988). While the basic learning of content is a necessary prerequisite for transfer of training, learning content or skills is not sufficient to consider that transfer of training has occurred, at least not as transfer of training is defined in most studies.

The transfer literature has focused on three key categories of factors that impact the level of transfer, originally outlined by Baldwin and Ford (1988) and further explored
by many subsequent researchers (Burke & Hutchins, 2007). These categories include learner attributes, training design or interventions, and the work environment. Learner attributes may include characteristics such as general intelligence or more malleable attributes such as learner motivation or attitudes towards training. Training design and interventions are related to the actual structure, content, and implementation of the professional development itself. These design factors may include aspects such as the sequencing of material, the activities in which learners engage during the training, and even specific transfer interventions before or after the training such as setting goals for use of material learned. Work environment factors include the level of support from supervisors and peers, the work climate, or even infrastructure elements that may encourage or inhibit individual’s ability to transfer. These factors related to transfer are discussed in much greater detail in the literature review found in Chapter 2.

In addition, although a multitude of empirical studies have been conducted in all these areas, researchers have noted some concerns about the way many studies have been conducted, such as the consistency of measurement and level of information reported in the studies; these issues limit the confidence in some of the reported results and hinder one’s ability compare study results (Blume, Baldwin, Ford, & Huang, 2010; Baldwin et al., 2009; Cheng & Hampson, 2008; Burke & Hutchins, 2007). Chapter 2 will outline some of these concerns and moderating factors, as well as other areas researchers have identified for future studies on transfer.

Furthermore, the literature related to some factors that may be of particular relevance to the eMINTS implementation at school districts will be outlined. These
include a review of some of the studies that have looked specifically at programs that have been focused on integrating technology-based school reforms.

**Definition of Terms**

Several key terms will be used throughout this study to discuss the school and programs involved. The following definitions are offered to help readers better understand their meanings.

**eMINTS National Center (eMINTS NC):** The organization that has created and manages the eMINTS professional development programs. The acronym “eMINTS” stands for “enhancing Missouri’s Instructional Networked Teaching Strategies,” although the program is no longer just a Missouri program, having expanded into nearly a dozen other states and Australia, as of 2009.

**eMINTS Professional Development Programs (eMINTS PD Programs):** Any of several intensive training opportunities for classroom teachers to help them learn to integrate technology (computers, Internet resources, and so on) into student-centered, inquiry-based teaching practices developed and offered by the eMINTS National Center.

**eMINTS Comprehensive Professional Development Program (eMINTS Comp PD Program):** One of the eMINTS National Center’s core training opportunities for classroom teachers who have technology-rich classrooms (including a teacher laptop, at least one computer for each student at the secondary level, an interactive whiteboard and data projector, scanner, digital camera, printer). Teachers in the eMINTS Comp PD Program attend over 250 hours of training over two years and receive monthly onsite coaching visits from an eMINTS Instructional Specialist. The goal of this program is for teachers to adopt the eMINTS Instructional Model in their teaching.
**eMINTS Teacher:** A classroom teacher who is currently attending or has successfully completed the two-year eMINTS Comp PD Program.

**eMINTS4All Program:** One of the eMINTS National Center’s core training opportunities for classroom teachers. Teachers in the eMINTS4All Program receive less equipment and training (about 90 hours total) than teachers in the eMINTS Comp PD Program, and act to support and extend the adoption of the eMINTS Instructional Model in the school. The training materials they receive are a subset of the eMINTS Comp Program materials, which focus more on the pedagogical approaches rather than the technology integration aspect of eMINTS. The equipment in eMINTS4All classrooms is also a subset of the equipment found in eMINTS Comp classrooms (including a teacher laptop, a set of laptop computers for students that may be shared with other classrooms, and an interactive whiteboard and data projector).

**eMINTS4All Teacher:** A classroom teacher who is currently attending or has successfully completed the two-year eMINTS4All Program.

**eMINTS Instructional Model:** There are four components of the eMINTS Instructional Model: High-quality lesson design, using inquiry-based learning (IBL), which builds classroom community, and is powered by technology. The core eMINTS programs teach teachers how to implement concepts and teaching strategies in these four areas into their classrooms, with the goal of creating effective student-centered, technology-rich classrooms.

**eMINTS Instructional Strategies:** This term refers to those teaching strategies that are consistent with the eMINTS Instructional Model. Some of these would include
project-based learning, cooperative learning, inquiry-based learning, problem-based-learning, and high-level uses of technology resources.

**Inquiry-based Learning (IBL):** A student-centered instructional strategy that includes student generation of questions, the investigation of real-world problems, and the creation of new knowledge and authentic products. Also sometimes referred to as “Inquiry-based Instruction” (IBI).

**Assumptions**

This research study was based on the following assumptions:

1. People have been honest and forthcoming with the information they shared with the researcher.
2. Documents examined accurately reflect the situation studied.
3. By examining one school, the researcher was able to capture an in-depth understanding of that particular site.

**Methodology**

The methodology used in this study was a single case study design that employed a variety of data collection methods, including the use of a questionnaire, interviews, observations, and document and artifact analysis. The school-wide eMINTS implementation at Owenville High School served as the single case study, within the context of the whole district implementation. While some information was gathered about the whole district, due to some of the unique challenges and characteristics of a high school eMINTS implementation, the focus of this study specifically was on understanding that part of the district in particular; the researcher did not attempt to
explore the elementary and middle school grades at Owenville School District in any depth.

Participants in the study included Owenville administrators and teachers at all levels throughout the district. Elementary and middle school teachers who had participated in eMINTS PD only were asked to anonymously complete an online questionnaire related to the district transfer climate as a whole. The high school teachers who had participated in the eMINTS PD were also asked to complete the survey. In addition, all Owenville High School teachers who had been involved in eMINTS PD while at the district, three additional high school teachers, the current and previous district-level and high-school level administrators, the technology coordinator/middle school teacher, and the curriculum director/district eMINTS Instructional Specialist (a total of 16 individuals) were all asked and agreed to be interviewed. Each of these 16 individuals was also asked to provide any supporting documents or artifacts for the study. Finally, each of the high school teachers who taught core subjects (mathematics, communication arts, social studies, and science) also agreed to allow the researcher to conduct a classroom observation for one class period.

The data from the survey, interviews, observations, documents and artifacts were all analyzed to develop a rich understanding of the eMINTS implementation. The data were also organized using NVivo software to determine and triangulate the various themes that emerged. A full description of the study findings is presented in Chapter 4.

Limitations

This study had several limitations, including the following:
This study was limited to only one site, the Owenville High School. Relevance to other sites will highly depend on how well this case resonates with those other sites.

As in many qualitative studies, the researcher was the primary instrument of data collection. While I attempted to remain as objective as possible, I do have a particular history with eMINTS and the Owenville School district. I have worked for the eMINTS National Center for over 10 years, first as an eMINTS Instructional Specialist (eIS) working with teachers and trainers, and currently in an administrative capacity as the eMINTS Program Director. I have visited the school for monitoring visits during their Title II.D grant implementation period and have also helped showcase the district to a number of visitors as an excellent example of a district-wide eMINTS implementation.

**Significance**

The study contributes to the current literature by adding to the qualitative research in the transfer of learning literature. While a large body of research has been conducted on transfer of learning over the past three decades, researchers have identified a notable lack of qualitative studies on transfer (Baldwin et al., 2009). Furthermore, many studies have focused on more direct skills transfer to be applied or generalized in the work environment; far fewer studies have focused on transfer of learning in professional fields like education that require transfer in a more autonomous setting and which require training participants to adapt complex concepts to their own work settings (Baldwin et al., 2009). In addition, few studies (transfer focused or otherwise) have been done specifically on technology and inquiry-based-learning integration programs. Studies of the Apple Classroom of Tomorrow (ACOT) program (Dwyer, Ringstaff, & Sandholtz, 1990) and Teacher-Led Technology Challenge Project (Cuban, 2001) are some of the few
exceptions. As Lawless and Pellegrino (2007) explain, “much of the activity under way on multiple levels of the educational system is driven by a strong perceived need for action, but it is often not guided by any substantial knowledge base derived from research about what works and why with regard to technology, teaching, and learning” (p. 576). This study expands the body of literature in the area of technology integration into classroom instruction.

This study's implications for practice include gaining an understanding of some of the unique issues involved in attempting to implement the eMINTS Program into a high school setting. As previously explained, the original eMINTS Program design began with elementary school teachers and has gradually expanded to secondary school classrooms over the past ten years. However, much of the research and evaluation previously done has been at the elementary level, and additional information about the challenges and needs of high school teachers implementing the program may be useful to eMINTS Program leaders. In particular, it will be helpful for eMINTS Program leaders to have greater insight about the goodness of fit between the eMINTS Professional Development materials and high school teachers. In addition, the lessons learned about challenges in the Owenville high school environment, such as those related to schedules, curriculum, and structural issues, may help other high schools increase their chances of successful eMINTS implementation in the future.

Conclusion

In summary, this study investigated the relationship of contextual factors on the level of transfer of learning from teachers who participated in the eMINTS Professional Development Program. Primarily qualitative research methods were used to investigate
this case, which was one particular rural, Midwestern high school that had significant success in implementing eMINTS instructional strategies into its classrooms. This single case study will provide fertile ground for understanding what particular contextual factors may be related to the transfer of learning process, which will hopefully inform future high school eMINTS implementations. The next chapter will address the literature that informs the present study.
Chapter 2: Literature Review

Introduction

The purpose of this chapter is to present an overview of the literature relevant to the present case study. The overarching body of literature that related to this research is that of transfer of learning. Since the primary concern of this study is to understand what contextual factors helped or hindered the transfer process of teachers participating in the eMINTS Program at Owenville High School, a better understanding of what the literature says about transfer of learning is imperative. While certain frameworks or concepts served to sensitize and guide the initial direction and design of the study, they were merely beginning points for the data collection process. This study did not attempt to test or validate theory, and the researcher remained open to other concepts that emerged as relevant throughout the data collection and analysis processes.

The body of literature on transfer of learning is quite extensive and encompasses a variety of settings, philosophical assumptions, and foci. Therefore, this literature review will give a general overview of the key concepts of transfer, including the difference between transfer of learning and transfer of training and the major categories of transfer factors (learner attributes, training design, and work context). In addition, some problematic issues related to the way some studies have been conducted in the field are explained. Finally, the chapter concludes with a more in-depth exploration of several particularly important work-context transfer factors that are most relevant to this study.

Overview of the Transfer Concept
Defining transfer of learning and transfer of training. In a general sense, the term “transfer” may be understood as “prior learning affecting new learning or performance. The new learning or performance can differ from the original learning in terms of the tasks involved…, and/or the context involved” (Marini & Gerereux, 1995, p. 2). If learners can transfer their learning, they are able to generalize and apply their newly acquired knowledge and skills to a new setting or context (Caffarella, 2002; Ford, 1994; Baldwin & Ford, 1988). Some authors, such as Caffarella (2002), use the terms “transfer of learning” and “transfer of training” basically interchangeably, while others, such as Ottoson (1997), make a distinction between the two terms. Generally speaking, “transfer of learning” is the broader term, which may encompass both the cognitive and behavioral changes of a learner. In the broadest sense, “all learning is transfer of learning…. [as] virtually all learning involves carrying over (emphasis in original) previous learning to new situations” (Haskell, 2001, p. 24). Therefore, “transfer of learning” may be applied to the wide spectrum of types of learning opportunities, including formal, informal, and non-formal, and to a variety of settings, such as those that are community based, work related, and so on (Houle, 1996). The concept of transfer is also found in some of the literature on learning organizations to refer to the ways in which individuals contribute what they have learned to the company’s knowledge base (Nonaka & Takeuchi, 1995).

In contrast, literature on “transfer of training” is a subset of the transfer of learning literature that is more narrowly focused on a more direct and observable application of new skills or knowledge to a specific setting, usually the workplace. Broad and Newstrom (1982) offer the following definition: “Transfer of training (emphasis in original) is the effective and continuing application, by trainees to their jobs, of the
knowledge and skills gained in training—both on and off the job” (p. 6). For example, in relation to the present study, transfer of training refers to the degree to which teachers actually take the concepts and strategies learned in their eMINTS Professional Development sessions and incorporate them into their teaching practices. Therefore, transfer of training is more narrowly focused and fits under the umbrella of the broader transfer of learning concept.

Different perspectives on knowledge and transfer. Several different schools of learning theories exist which address the questions of what is knowledge and how do individuals learn. One perspective is that of cognitive orientation, which focuses on the mental processes of the learner in the learning process. Many theories and research approaches have their roots in cognitive theory, including information processing, memory and cognition, the development of expertise, as well as transfer of learning (Merriam & Caffarella, 1999). From this perspective, the learner processes and makes meaning of new information by comparing and associating it with prior knowledge, and over time the brain develops complex conceptual webs of information (Anderson, 1984). To put it succinctly, “Learning involves the reorganization of experiences in order to make sense of stimuli from the environment” (Merriam & Caffarella, 1999, p.154). From a cognitive perspective, transfer of learning means helping the learner better process and make connections to existing mental models, in order to acquire and make meaning of the new information.

Social learning or sociocultural orientation advocates also focus on how learners make meaning of new information but believe that much of the meaning of information
or skills is directly tied to the social and cultural context of their use (Merriam & Caffarella, 1999). For example, Lave and Wenger (1991) explain this concept as follows:

Social practice emphasizes the relationship interdependency of agent and world, activity, meaning, cognition, learning, and knowing. It emphasizes the inherently socially negotiated character of meaning and the interested, concerned character of the thought and actions of persons-in-activity. This view also claims that learning, thinking, and knowing are relations among people in activity in, with, and arising from the socially and culturally structured world. (p. 50)

While cognitive or information processing theorists believe that information and skills can be abstracted and taught out of the real-world context of use, the sociocultural perspective of learning argues that knowledge cannot be divorced from the real-world activities and cultural context of its use. Furthermore, Brown, Collins, and Duguid (1989) argue that knowledge is “a product of the activity, context, and culture in which it is developed and used” (p. 32) and cannot be meaningfully taught in abstraction. In addition, the goal of learning is not just acquiring and being able to recall knowledge and skills, but the true test of successful learning transfer is “improved participation in interactive systems” (Greeno, 1997, p. 12). The sociocultural perspective is the underlying framework for research and theories that emphasize learning in real-world contexts, such as on Bandura’s work on observational learning through modeling and situated cognition and cognitive apprenticeships (Merriam & Caffarella, 1999; Collins, Brown & Holum, 1991; Lave & Wenger, 1991; Bandura, 1986). These perspectives are relevant to the issue of transfer of learning in that the way one will approach the issue of transfer will depend in part on how one believes learning occurs and what one believes about the nature of knowledge itself. The sociocultural perspective also most closely aligns with the way that the eMINTS Program Professional Development sessions are
designed, which is to take into account the context into which the concepts will be applied and to have eMINTS Instructional Specialists model many of the suggested teaching strategies.

**Measuring transfer.** While general definitions of transfer are a good starting point, as Ford (1994) explains, “transfer is not a static concept…. [It] must be defined within the context of what is relevant to the type of educational intervention and the intended objectives or outcomes of a particular program” (p. 22). He suggests that several questions need to be answered to define the term transfer in a meaningful way, including what specific changes are expected during an educational experience (in knowledge, skills, or attitudes) and where they will be applied. In addition, Ford (1994) suggests that it is imperative to look at the length of time after which one can expect to see the desired changes or behaviors: Does one look only at transfer directly after the training or at some point down the road? Broad and Newstrom (1992) cite a study by Newstrom (1986) of human resource development (HRD) professionals’ perceptions of management development programs, which suggests that transfer rates diminish significantly over time, with rates as low as 15%. “On the average these professionals believed that only about 40% of the content of programs they conducted was transferred to the work environment immediately after training, about 25% was still being applied six months later, and—the true bottom line—a mere 15% was still being used at the end of a year” (Broad and Newstrom, 1992, p. 7). Similarly, Saks’ (2002) survey of HRD professionals indicated that respondents believed “that some 40% of trainees do not transfer immediately after training and this rises to close to 70% after 1 year” (Saks, 2002).
Therefore, expected length of time for transfer is one factor that must be defined for an evaluation of transfer.

Ottoson (1997) suggests that the level of transfer needs to be well defined in any evaluation of transfer of learning. She presents a variety of lenses, including transfer of training, knowledge utilization, application, diffusion, and implementation. She defines the “transfer of training” lens narrowly as the close replication of skills from the training classroom setting to the actual realm of practice. Per Ottoson, the “transfer lens is used often in business and industry, the military, and other skill training contexts. In these contexts it matters that the pilot, the surgeon, or the chemical worker transfers the skills with fidelity and precision” (1997, p. 89). She suggests that while this lens is helpful for some types of desired outcomes, in other cases, a broader view may be useful. For example, in some cases, it may be more important that learners make significant adaptations of the knowledge or skills to their own practice setting, and the application lens might be more useful: “Application is less about the precision of skills than about the artistry of practice. It is less about the wholesale transfer of ideas or skills and more about the goodness of fit between ideas and context” (Ottoson, 1997, p. 91). Similarly, Ford (1994) makes the distinction between direct and indirect application, as well as the need to determine the level of importance for learners “to demonstrate behavioral adaptability in the face of changing conditions in the transfer setting” (p. 23). Therefore, the goals of the learning experience and the context to which learning will be transferred likely will affect what a meaningful definition of transfer is. For example, in one study by Graham, Wedman, Monahan, and Tanner (1998), researchers attempted to link face-to-face training on topics such as “negotiating skills, methods of understanding clients’
organizations, systemic ways of designing and developing proposals” (p. 105) to specific increases in sales performance. Participants were interviewed three to four months after the training to assess the level of implementation of the new skills taught on the job, find out what aspects of the training courses made them most effective, and if particular sales could be linked directly to training. They found that “the training could be linked to over $220 million in sales—that is over, two million dollars for every individual [they] interviewed involved in training whose work involved direct sales” (Graham, Wedman, Monahan, & Tanner, 1998, p. 108). Studies like these can help organizations justify their investment in training and show how it contributes to the larger goals of the organization.

Expanding on this idea of showing how training supports larger organizational goals, Broad (2005) makes the point that “transfer of training” is defined very narrowly and suggests that a new, more expansive definition of transfer is needed. She says, “First, we no longer accept input measures (such as numbers of training sessions or learners) as indicators of success for the traditional “training” function; success is now measured by performance on the job and organizational results (emphases in the original)” (p. 86). She also suggests that with new methods of delivery, such as online learning and communities of practice, it is limiting to focus solely on the “training” setting in the definition. Finally, she suggests that simply measuring the effect on trainees’ performance is too limiting, since the effects on other organizational stakeholders (such as customers, suppliers, community members, and so on) may be of significance, as well. For example, the No Child Left Behind Act of 2001 (NCLB, 2002) suggested that high-quality professional development for teachers would not only improve teacher performance but also lead to measurable gains in student achievement.
In summary, while transfer could be argued as the most basic goal of education, “the history of research findings on transfer suggests it seldom occurs in instructional settings” (Haskell, 2001, p. 9). This “transfer problem” has prompted a plethora of studies attempting to try to understand what factors truly affect transfer and how various interventions might improve the level of transfer of training.

**Major Training Transfer Literature**

Transfer of training is a topic that has been substantially researched for the past three decades. While much has been learned over that time, much of the research remains either inconclusive or simply not applied to training practices. Baldwin and Ford (1988) did the first comprehensive review of the transfer of training literature. Based on their meta-analysis of 63 empirical studies, they critiqued the strength of the research in relation to “the impact of training-input factors on training outcomes and conditions of transfer” (p. 66). They created a model of the transfer process, which included training inputs, training outputs, and conditions of transfer.

The three categories of training inputs identified are training design, trainee characteristics, and the work environment. The trainee characteristics include ability, personality, and motivation. Training design is comprised of the learning principles integrated, sequencing of material, and job relevance of the training content. Work environment refers to the “climatic factors such as supervisory or peer support as well as constraints and opportunities to perform learned behaviors on the job” (p. 64). In their model, each of these inputs has an influence on learning and retention, the training outputs. In addition, learning and retention, as well as trainee characteristics and work environment influenced the conditions of transfer, defined as generalization and
maintenance. As Baldwin and Ford (1988) explain, in order “for transfer to have occurred, learned behavior must be generalized to the job context and maintained over a period of time on the job” (p. 63).

Several subsequent meta-analyses and literature reviews have been conducted since that seminal piece by Baldwin and Ford (Blume et al., 2010; Baldwin et al., 2009; Cheng & Hampson, 2008; Burke & Hutchins, 2007; Cheng & Ho, 2001; Alliger, Tannenbaum, Bennett, Traver & Shotland, 1997; Ford & Weissbein, 1997). Many of these summary articles have found mixed or conflicting results for a variety of factors related to transfer. For example, Cheng and Hampson (2008) have stated, “We have reviewed the existing literature on transfer and found that there are inconsistent and puzzling findings in the empirical research. This is a problem for the field” (p. 336-337). One of the most comprehensive and recent updates to the original Baldwin and Ford (1988) study was conducted by Blume, Baldwin, Ford, and Huang (2010) in their meta-analysis of “93 independent samples (N=24,493), including 60 published articles, 5 unpublished conference papers, 26 dissertations, and 2 unpublished articles” (p. 1075). They looked at any empirical studies that showed a correlation between transfer and any of the following factors: “age, gender, education, experience, cognitive ability, the Big Five personality traits, locus of control, goal orientation, job involvement, voluntary participation, pretraining self-efficacy, motivation to learn or transfer, work environment, learning outcomes of knowledge or self-efficacy, reactions, and pre- or post-transfer intervention” (p. 1075). They examined both predictive factors, as well as factors which acted as moderators of the relationship between transfer and the predictive factors. Their study confirmed some previous findings of the predictive relationship between cognitive
ability, conscientiousness, motivation, and a supportive work environment with training transfer. Most interestingly, however, their examination of moderator effects addressed many of the compelling questions from the previous reviews, offering some explanation for some of the conflicting findings for various factors. Namely, they noted many differences and problems in the way that transfer was studied, such as using different definitions and measurements of the transfer concept, which accounted for differences in findings rather than true differences in relationships of transfer and predictive factors. The general findings of these reviews and meta-analyses are discussed in greater detail in the next section, followed by an in-depth discussion of the moderating factors on transfer.

Transfer of Training Factors Studied in the Literature

**Learner characteristics.** Learners bring a variety of factors to the educational setting that may affect the probability that transfer will or will not occur (Blume et al., 2010; Burke & Hutchins, 2007; Broad & Newstrom, 1992; Noe, 1986). For example, as Broad and Newstrom (1992) note, prior to the training, “people have acquired many attitudes, values, and habits over time; these will likely interfere with the acquisition of new learning unless dealt with first” (p. 25). Many times, unless participants know “what’s in it for me?” or “what they can expect to gain from a behavioral change” (Broad & Newstrom, 1992, p. 89), they may fail to participate in the training or make any effort to transfer the new knowledge and skills taught. In other cases learners may be motivated to learn, but may feel uncertain in their own ability to successfully implement the new skills or knowledge. Learners may have difficulty knowing when to use the new skills or knowledge in the real-world setting, not recognizing the similarities between the two situations (Haskell, 2001). The relationship between trainee characteristics and the
transfer process have been extensively studied in the transfer literature. Some of the key factors and finding are summarized here.

**Cognitive ability.** One of the most consistent finding in the transfer literature is the relationship between a learner’s cognitive ability, specifically general intelligence (g), and his or her transfer of learning (Burke & Hutchins, 2007). For example, in their meta-analysis of two decades of research, Colquitt, LePine and Noe (2000) found that the corrected correlation coefficient between cognitive ability and training transfer is moderately high at .43.

**Self-efficacy.** The term self-efficacy refers to one’s belief in his or her ability to be successful at achieving particular goals (Bandura, 1986). Burke and Hutchins (2007) noted that “in terms of transfer outcomes, self-efficacy has been found to be positively related to transfer generalization and transfer maintenance across multiple studies” (p. 266). Colquitt et al. (2000) also noted strong relationships between self-efficacy and transfer. In addition, researchers have noted that self-efficacy may be a learner characteristic that can potentially be influenced by certain interventions, which may provide an opportunity to improve rates of transfer (Burke & Hutchins, 2007; Colquitt et al., 2000).

**Motivation.** Many researchers have found that learner motivation (both for learning and transfer) has a positive influence on the level of training transfer (Blume et al., 2010; Burke & Hutchins, 2007; Colquitt et al., 2000; Seyler, Holton, Bates, Burnett, & Carvalho, 1998). This finding on the influence of motivation even held up to the intense scrutiny of Blume et al.’s (2010) meta-analysis that controlled for a number of moderating effects in the training literature.
Conscientiousness. Another learner characteristic that was found to have a positive relationship with transfer was learner conscientiousness (Blume et al., 2010; Colquitt et al., 2000). Many other personal characteristics examined did not seem to consistently be related to transfer, including perceived utility of training, job and career variables, and internal versus external locus of control (Burke & Hutchins, 2007).

Training design and interventions. In their original meta-analysis on transfer, Baldwin and Ford (1988) note that:

It is clear that the experimental work on improving the training process is the most developed and rigorously researched. The results of research on the effects of the learning principles of identical elements, general principles, conditions of practice, and stimulus variability on retention has been quite robust. (p. 86)

In addition, more recent literature has examined the link between transfer and additional training practices, such as conducting a needs analysis, creating learning goals, and behavior modeling. Some of these linkages are discussed in more depth in the following section.

Conditions of practice. Baldwin and Ford (1988) highlight several of conditions of practice that were found to have a positive effect on transfer. For example, distributed practice, as opposed to massed practice, refers to training being divided into multiple segments. Distributed practice was found to increase learners’ retention of material. Similarly, feedback given to learners about their performance was also found to positively impact transfer; however, Baldwin and Ford (1988) note that “timing and specificity are critical variables in determining its effects” (p. 67).

Identical elements. The concept of identical elements refers to the level of fidelity between the learning environment and the actual work context. Baldwin and Ford (1988)
note that studies have shown that the greater the similarity between the stimulus and response elements, the greater level of transfer. They caution, however, “The critical operational problem is: ‘What, specifically, in the training program must be made identical to the actual work environment to facilitate learning, retention, and transfer?’” (p. 86).

**Overlearning.** Another practice found to improve transfer is overlearning, or practicing skills past the point of mastery. Burke and Hutchins (2007) explain that this type of strategy can be most effective in improving transfer when there is a substantial delay between the training session and the opportunity to use the skills (i.e., CPR training). “Overlearning works by creating automatic responses that conserve a trainee’s cognitive resources so that cognitive ability may be dedicated to solving novel or more complex tasks” (p. 275).

**Behavior modeling.** Research has also suggested that providing learners with models of learning outcomes can improve retention and generalization of principles (Baldwin et al., 2009; Baldwin, 1992: Taylor, Russ-Efft, & Chan, 2005). For example, Taylor, Russ-Efft, and Chan (2005) conducted a meta-analysis in the area of behavior modeling. Their findings suggest that the use of behavior modeling techniques were most successful on increasing transfer when both positive and negative modeling was shown.

**Intervention timing.** Saks and Belcourt (2006) note that in their study interviewing training professionals from 150 organizations, those that implemented transfer strategies before, during, and after training significantly increased their degree of transfer to the workplace. In particular, their “activities that occur in the work environment before and after training were more strongly related to transfer, providing
further evidence of the importance of the work environment for transfer of training” (Saks & Belcourt, 2006, p. 642); ironically, however, they note that the most common transfer strategies applied were those used during the training, possibly because training professionals had the greatest control over those activities. In particular, as many previous studies had also found, they note that supervisor support and involvement was an important factor in transfer (Cromwell & Kolb, 2004). Brinkerhoff and Montesino (1995) also found that supervisor actions taken to encourage transfer before and after the training had a large impact on the actual transfer of learned material. They divided trainees into two groups—those that received pre- and post-training interventions from their managers and those who did not. They found that trainees with the supervisor support reported both more positive perceptions about the factors influencing transfer in the workplace and also reported greater use of the training content on the job.

**Work environment or transfer context.** As indicated previously, the work environment can have a large influence on whether or not transfer occurs. The organizational context is often one of the largest barriers to the transfer process: “The best trainers, working with the most relevant and powerful content, will find little success or receptivity in poor organizational climates” (Joyce & Showers, 1995, p. 111). For example, Broad and Newstrom (1992) found that the top three barriers to transfer were related to the context of transfer rather than the trainee. These included the following: 1) “lack of reinforcement on the job,” 2) “interference from immediate (work) environment,” and 3) “nonsupportive organizational culture” (p. 19). While organizations may willingly invest in professional development opportunities for staff, sometimes the goals for such training have not been well thought out or clearly articulated. When
employees return to work, they often find no support or incentive for using what they have learned (Caffarella, 2002; Broad & Newstrom, 1992). For example, teachers may be asked to learn about eMINTS, and they may also be asked to implement a highly scripted, structured reading program that directly contradicts many of the aspects of the eMINTS Instructional Model. Teachers may be confused about how to rectify apparent contradictions between the two programs and ultimately not transfer the concepts of one or both programs into their classroom practice.

**Coaching and mentoring.** The manager or supervisor can also help create a structure of support for the learner, including connecting him or her with a coach or mentor, and providing other necessary resources. Coaching, in particular, can play an extremely powerful role in transfer (Joyce & Showers, 1995): “The effective coach is a role model who can communicate, motivate, instruct, and provide effective feedback in a non-threatening way” (Cheek & Campbell, 1994, p. 27). The coach can help learners overcome barriers they experience in their actual work setting that may have otherwise completely derailed the transfer process. In addition, the skilled coach can help the individual develop metacognitive skills, and the ability to self-manage and self-monitor performance. These skills can help sustain the transfer process long after the formal coaching relationship has ended (Costa & Garmston, 1994; Collins, Brown, & Holum, 1991). While it is ultimately the decision of the learner to implement the transfer plan, the more barriers that can be removed from the environment and the more ongoing, positive support available, the greater the chance that transfer will occur and be sustained.

**Support.** The transfer literature strongly suggests that peer and supervisor support (or lack thereof) can have an enormous impact on the level of transfer in many different
work environments (Blume et al., 2010; Colquitt et al., 2000; Burke & Hutchins, 2007).

However, in some studies, the influence of peers appears to be a stronger factor, while in other studies, the impact of supervisors appear stronger. This discrepancy generally seems to be explained by the degree to which employees depend on peers or supervisors to be able to complete their tasks at work and the amount of interaction they have with one or the other. For example, for individuals working in jobs that are highly team based, the influence of peers seems to have a much stronger relationship with transfer of learning.

As discussed previously, many studies have suggested that certain learner attributes, training interventions, and work environment factors can facilitate or inhibit transfer of learning. However, some researchers have suggested that the transfer literature as a whole needs to be looked at cautiously. The following section presents certain issues and factors that may moderate the findings of previous transfer research.

**Moderators of Transfer Factors**

In their recent meta-analysis of transfer studies, Blume et al. (2010) identify a number of moderating effects on the relationship between predictive factors and transfer outcomes. They note that many of the moderators have not been taken into account in most transfer studies. When they controlled for these moderator effects, many factors which were previously thought to have a strong effect on transfer no longer had those effects. What follows is a detailed description of the moderators they identified, as well as some other issues affecting the possible validity of transfer studies.

**Method variance effects.** One highly significant moderator that Blume et al. (2010) examined was the source of the data on transfer. The studies examined in this
meta-analysis included approximately equal proportions of those that included others’ ratings, objective measures, and self-report measures. However, the researchers “found a subset of studies that are likely to inflate transfer relationships and, if included in the meta-analytic estimates, would provide inaccurate results. These studies are those in which same-source and same-measurement-context (SS/SMC) effects are present. For example, in some studies exploring effects of work environment on transfer outcomes, the measurements of both the input factor (i.e., support) and the outcome factor of transfer were gathered from self-report measures at the same time” (p. 1071). Their analysis concluded that indeed a significant and consistent inflation of the relationships explored, with “this effect of SS/SMC ranged from approximately .10 to .50, with correlations typically being inflated by around .20 to .30” (p. 1090). Therefore, they concluded that many of the finding of relationships in the transfer literature to date have likely been overstated due to the SS/SMC moderating effect. Therefore, in their study, Blume et al. (2010) chose to do analyses which controlled for the SS/SMC effect and report on results using only studies that were not impacted by the SS/SMC issue in order to have more confidence in the resulting findings. They note, “once SS/SMC is controlled for, there are a surprisingly limited number of strong predictor relationships with transfer” (p. 1089). Blume et al. (2010), in fact, call for a moratorium on such studies in the future.

Some traditional factors which still showed moderately strong transfer relationships included conscientiousness and voluntary participation, as well as cognitive ability. Several others, such as pretraining self-efficacy, motivation to learn, and learning goal orientation, showed moderate transfer relationships (Blume et al., 2010).
In contrast, Blume et al. (2010) found that several other factors that had shown stronger results in past literature such as transfer interventions including “goal setting, relapse prevention, and program framing (i.e., optimistic previews)” failed to show strong relationships: “Put simply, the evidence in support of transfer interventions was not as compelling as either our intuition or prior transfer commentaries would suggest” (p. 1092). They note that one reason that such strategies may not be highly effective are the typically short amount of time spent on such interventions, most lasting no more than two hours total.

**Open skills versus closed skills.** Blume et al. (2010) looked at the type of training outcomes that were desired to be transferred. For example, as mentioned earlier, some types of training aim to have participants replicate trained skills very closely, such as the case for a pilot or chemical worker (Ottoson, 1997). Other examples would include certain types of technical training and the learning of computer software (Blume et al., 2010). Blume et al. (2010) called these types of skills “closed.” In contrast, open skills refer to training in which the learners have more “latitude in deciding a course of action…. [such as] leadership and interpersonal skills training” (p. 1076).

**Differing transfer criteria.**

**Use versus effectiveness measures.** Another moderating factor Blume et al. (2010) examined was the transfer criterion. They compared studies that looked at transfer as merely use of skills or knowledge in the work setting versus those studies that defined the transfer criterion as using them effectively, in that work performance improved. They found that use measures of transfer tended to show somewhat stronger relationships than effectiveness measures:
For example, trainee motivation has a stronger relationship with transfer measures of use than with measure of effectiveness. This is consistent with the reality that trainees with higher levels of motivation attempt to utilize trained skills more often. However, how effective the trainee is in transferring training is affected by additional factors that may not be under the direct control of the trainee. In addition, motivation is just one factor that affects trainees’ ability to effectively transfer training. (p. 1093)

Blume et al. (2010) suggest that the effectiveness criterion is a more useful measure of transfer since the real goal is to improve work performance; therefore, implementing the training content effectively is far more important that merely using it. 

*Transfer proxies.* Another problem identified in the transfer literature is an issue of truly assessing transfer of training, which is whether or not the skills and knowledge learned in the training are implemented into and sustained in the work context. This has been a long-standing problem which Baldwin and Ford (1988) identified in their meta-analysis. For example, Baldwin and Ford (1988) explain that in some studies the transfer criterion was intention to transfer, which in reality is a measure of the motivation to transfer, not transfer itself. Burke and Hutchins (2007) note similar issues with many transfer studies that have assessed various learner attributes, such as personality and motivation: “Instead, many studies on individual-level variables assess transfer intentions, motivational aspects (such as motivation to improve performance through learning), or motivation to transfer, leaving only speculation as to whether these variable really contribute to sustained performance” (p. 286).

When examining the open skills versus closed skills studies, Blume et al. (2010) found that the relationship to transfer of predictor variables was stronger for open skills. They specifically cite pretraining self-efficacy, motivation, and the environmental context as having a greater impact on transfer with open skills: “With open skills, trainees have
more choice as to what and how to apply trained principles and concepts to the job. Closed skills, in contrast, have much more prescribed transfer behaviors, and thus the impact of environmental factors may be considerably less” (p. 1093). Baldwin et al. (2009) suggest that a majority of the transfer studies have been focused on closed skills: “Today’s reality, however, is that more jobs require open skills and are not heavily supervised” (p. 52). They note that this presents challenges to the study of transfer, particularly making it hard to know what to look for in the work environment after training and hard to measure the impact of transfer. They note that there is a need to “consider measuring both how well individuals can generalize from the training to the job contact and how well trainees can adapt their strategies gained in training to the changing conditions of the job” (p. 52). Professionals, such as teachers, who have a high degree of autonomy and context variability, would seem fit into this challenging category for measuring transfer, which may be why so few transfer studies have focused on the education arena.

**Technology Integration**

While transfer has been written about extensively in the human resources and psychology literature, less has been written specifically about transfer of educational technology into classroom practices. However, with the increasing investment in technology in schools, recently more researchers have begun to explore what specific factors help to increase the level of implementation and type of technology integration into the classroom. Not surprisingly, these technology integration studies have some similarities to other transfer studies, in that they have noted the importance of the learner attributes and the support of the work environment. In addition, however, they have
added some new perspectives on transfer factors that are uniquely important to this particular type of transfer objective.

For instance, Inan and Lowther (2010) tested their research-based path model on a sample of 1,382 Tennessee public school teachers to determine the direct and indirect factors influencing technology integration in the classroom. They defined technology integration as those uses of computers that are used to support classroom instruction, which they grouped into three categories: technology for instructional delivery, technology for preparing instruction, or students using technology as a tool. They used the Teacher Technology Questionnaire (TTQ) in which teachers answer questions that rate their level of agreement to statements regarding five technology-related areas including the following: teachers’ beliefs, teacher readiness, overall support, technical support, and their frequency of technology integration. The TTQ also asks teachers to report on various demographic factors including teachers’ age and years of teaching experience, as well as level of computer use.

Inan and Lowther’s (2010) study confirmed that certain teacher characteristics and environmental factors had an impact on technology integration. Based on their analyses, they note that “the model clearly illustrates that teacher technology use is a complex process that is influenced by both teacher characteristic and their perception of school environments” (p. 147). Specifically they found that years of teaching had a significantly negative relationship with both teachers’ readiness and integration of technology in the classroom. They also note “as most previous studies found, there is a strong relationship between the frequency of computer use and the number of computers available in the classroom” (p. 147), however, they stress that many studies have also
established that the presence of computers alone is not sufficient for classroom technology integration to occur. In addition, teachers’ beliefs and readiness regarding technology had a strong positive effect on the level of technology integration in the classroom. They also found that these two teacher factors (beliefs and readiness) mediated the indirect effects of both school and teacher-level factors on technology integration: “The current study supported the hypothesis that teacher belief is one of the essential factors that explains technology use…. [which] is in alignment with the abundance of previous research that suggests that the personal beliefs and dispositions of teachers may relate to technology integration in the classroom” (p. 148). They also note that teachers’ beliefs are influenced by several school environment variables (overall support, computer availability, and technical support), as well as teachers’ computer proficiency. These environment factors also had a strong influence on technology integration. They note that “with sufficient technical support, teachers feel more competent and ready to integrate technology” (p. 148). Finally, they explain that “of all factors examined in the model, the one having the most important influence on technology integration was the teachers’ readiness to integrate technology, after controlling for other model variables” (p. 148) which was most strongly and positively influenced by teacher computer proficiency.

In his book *Oversold and Underused*, Cuban (2001) discusses many of the barriers to technology integration in the classroom. One challenge in the technology integration literature, like other transfer literature, is that the definition of "successful outcomes" varies widely (Lawless & Pellegrino, 2007; Cuban, 2001). Some of these divergent goals include the following: increasing student productivity through better
teaching and learning, transforming the classroom from traditional textbook lessons to more student-centered environment, and improving students’ computer literacy so they can compete in increasingly high-tech workplaces (Cuban, 2001).

Cuban makes the case that trying to implement technology integration into the existing school structures is extremely challenging: “Without attending to the workplace conditions in which teachers labor and without respect for the expertise they bring to the task, there is little hope that new technologies will have more than a minimal impact on teaching and learning” (Cuban, 2001, p. 197). Regarding implementation challenges that exist specifically at the high school level, he asks the reader to think about all the historical constraints that are imposed on this particular group of teachers.

The separate classrooms, individual departments, age-graded groupings, and six-period work day. Add the time spent by each teacher to work out the logistics necessary to bring classes to media centers and computer labs. Then factor in nervousness over possible server crashes, software foul-ups, printer glitches, and slow Internet connections. Any high school teacher who manages to use computers in the classroom has somehow overcome a host of organizational obstacles, political decisions made by others remote from the classroom, and difficulties associated with the technology itself, including mismatches between “rampant featurism” and the teacher’s practical needs in the classroom (p. 173).

Overall, Cuban suggests that despite the billions of dollars that have been invested in wiring and installing hardware and software in schools, few of the gains in student achievement and improved student-centered classroom practices have been realized (2001). He argues that such goals will not be realized without “considerable changes in school organization, respect for teacher expertise, and the distribution of decision-making authority among teachers, administrators, and policymakers” (p. 189).
O’Dwyer, Russell, and Bebell also emphasize the importance of the context, as well as teacher characteristics, in the success or failure of technology integration in schools in their article discussing the Use, Support and Effect of Instructional Technology (USEIT) study, which focused on teacher-technology use in elementary, middle and high school classrooms (O’Dwyer et al., 2005; O’Dwyer et al., 2004). In one USEIT study, they used multilevel regression techniques to analyze survey data from 1,490 elementary school teachers in 96 Massachusetts schools to understand how technology was being used and what organizational and school factors impacted the level of use. They found that the leadership practices and emphasis on technology at the school- and district-levels, as well the technology-related professional development for teachers impacted a variety of teachers’ use of technology. In addition, they found that individual teacher attributes were also associated with increased technology use in the classroom, including “pedagogical beliefs, confidence using technology, and beliefs about the benefits of technology for students” (p. 19). Their study on the USEIT implementation at the middle and high school level confirmed many of the same findings as the study focused on elementary school teachers (O’Dwyer et al., 2005).

As they summarize the implications of their findings, they explain that “this research suggests that a school that aims to increase student use of technology during class might shift the focus of professional development to technology integration, increase pressure by the principal and superintendent to use technology, increase the availability of technology within the school, and limit the amount of restrictive policies relating to technology use” (O’Dwyer et al., 2004). In addition, these researchers note that their findings suggest that showing teachers examples of effective use of technology
with students will help increase their positive beliefs about technology use, which will in turn translate into greater technology use in the classroom.

Although technology integration into classroom instruction has much in common with previous transfer literature, these articles help identify some unique aspects of the transfer system for these particular objectives and context. This perspective is especially informative for the study of transfer factors influencing the eMINTS implementation at Owenville High School.

**Leadership and Culture**

Two particularly important aspects of a work environment, which can have a major impact on the ability of individuals to learn and transfer their learning, are the leadership and culture present in that organization.

*Leadership and transfer.* One fairly consistent finding in the literature about transfer of learning and organizational reform is that supervisors can have a significant impact on whether or not those efforts are ultimately successful. For example, in their research on transfer, Blume et al. (2010) also note that their findings indicate a relationship between transfer and support, and they state (citing the correlation coefficients with transfer in parentheses) that “supervisor support (.31) may have a stronger relationship with transfer than does peer support (.14), although these relationships also are based on small sample sizes” (p. 1079). Similarly, in the educational context, the principal and other administrators can have an enormous impact on whether transfer occurs in the workplace setting. For example, Scribner, Cockrell, Cockrell, and Valentine (1999) assessed the potential for a school improvement process (SIP) to promote professional communities through the processes of organizational
learning at the middle-school level. These researchers found that one of the significant factors in successful implementation was the principal’s leadership approach: “In each of the schools, data revealed how leadership actions either facilitated or impeded the establishment of professional communities through SIP. These styles, observed by us and/or perceived by the participants, influenced the manner and extent to which faculty engaged in SIP” (p. 148). Furthermore, they found a principal’s efforts to build trust among the teaching staff increased the shared sense of purpose among administration and teachers.

Another study conducted with principals at eMINTS schools found a strong link between the leadership style of the principal and the classroom teaching styles of the eMINTS teachers. In particular, in schools where principals had a more participatory, collaborative leadership style, the teachers taught in a student-centered, teacher-facilitated style (highly aligned to eMINTS principles). In contrast, when principals had a more authoritarian leadership style it tended to be predictive of more eMINTS teachers who taught in a more teacher-directed manner (OSEDA, 2003).

In his book *School Leadership that Works: From Research to Results*, Marzano (2005) presents the findings of an extensive meta-analysis on school leadership focusing on school principals, which examined studies from 35 years of research. He outlines “the 21 responsibilities of the school leader,” (p. 41) which he defines as the essential behaviors of successful school principals engaged in the school change process with the goal of improving student academic outcomes. In addition, he suggests that two different types of change exist: first-order change and second-order change, each of which
requires the school leader to use different skills or “responsibilities” to improve the chances of success.

First-order change is incremental. It can be thought of as the next most obvious step to take in a school or a district. Second-order change is anything but incremental. It involves dramatic departures from the expected, both in defining a given problem and in finding a solution. (p. 66)

He suggests that for major school reforms, those of second-order change, the key principal responsibilities include: (a) knowledge of curriculum, instruction, and assessment; (b) optimizer, wherein the leader “inspires and leads new and challenging innovations” (p. 43); (c) intellectual stimulation, in which the leader makes conversations about the “most current theories and practices…a regular aspect of the school’s culture” (p. 42); (d) change agent, in which the leader is able to take risks and challenges the status quo; (e) monitoring/evaluating, where the leader gathers feedback on the effectiveness of the reform and its effects on student learning, (f) flexibility, meaning that the leader is able to adapt to changing situations and allow others to voice dissenting opinions; and (g) ideals/beliefs, meaning that the leader “communicates and operates from strong ideas and beliefs about schooling” (p. 42).

Marzano (2005) concludes his work with a chapter on the practical importance of developing a plan to successfully implement a school reform. He suggests the following five steps in developing a plan:

1. Develop a strong school leadership team.
2. Distribute some responsibilities throughout the leadership team.
3. Select the right work.
4. Identify the order of magnitude implied by the selected work.
5. Match the management style to the order of magnitude of the change initiative. (p. 98)
Marzano makes a point to acknowledge that list of 21 responsibilities is quite lengthy and he understands that it is unrealistic to expect that any single individual could be skilled at all the necessary behaviors listed. Therefore, he suggests a solution to this problem is to take a team approach to leadership in a school reform effort, capitalizing on the variety of strengths from the team members and distributing responsibilities of reform among them. In summary, Marzano outlines extensive evidence regarding the relationship between the actions of a principal and the ability of a school community to successfully implement reform efforts.

**Defining culture.** In his attempt to construct a unified and useful definition of the concept of culture, Schein (2004) offers the following definition of culture:

A pattern of shared basic assumptions that was learned by a group as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems. (p. 17)

Schein suggests that one initial way to discover some of the elements of a particular culture is to examine the socialization process for new members, looking at what newcomers are taught and learn as they “gain permanent status and are allowed into the inner circles of the group” (p. 18). He outlines three levels of culture that may be analyzed to get a sense of a particular group or organization. First, at the most visible level he calls the “artifacts [which] includes the visible products of the group,” such as the structure of the organization, its physical environment, stories told about the group’s history, observable rituals, and so on. At the next level are the “espoused beliefs and values,” which refer to the group’s norms and rules of behavior that have been articulated. Finally, Schein suggests that the most legitimate and most difficult level of
culture to uncover is the group’s basic underlying assumptions. These are premises upon which actions are taken, yet they are so universally accepted by the group, they may become unaware of these: “In fact, if a basic assumption comes to be strongly held in a group, members will find behavior based on any other premise inconceivable” (p. 31). Schein suggests that for a group or organization to sufficiently adapt and change to meet the changing demands of its environment, it is imperative for its leadership to examine and understand its culture.

Other scholars have developed a broader view of the definition of culture. Martin (2002), for example, disagrees with Schein’s perspective that only “true” culture exists at the level of underlying assumptions. She believes the external, visible aspects of culture are just as legitimate as these less visible aspects. In addition, she takes issue with the idea that an organization’s culture is only the majority’s shared values and perspectives on reality. She suggests that the reality of organizations is much more complex and in any organization, multiple subcultures will likely exist with each subculture having its own legitimate view of reality. She suggests that the existence of these subcultures and the ideas of multiple views of reality within a single organization have been largely ignored in most of the previous literature on culture.

She suggests that culture can be viewed from one of three theoretical perspectives: “harmony (integration), conflict between groups (differentiation), and webs of ambiguity, paradox, and contradiction (fragmentation)” (Martin, 2002, p. 120). The integration perspective most closely aligns with Schein’s interpretation that culture can be clearly defined and is generally unambiguous. The differentiation perspective focuses on the consensus of subcultures, rather than on some unified organizational reality:
“From the differentiation perspective (italics in original), consensus exists within an organization—but only at the lower levels of analysis, labeled ‘subcultures’” (p. 94). These different subcultures may be in conflict or in harmony with one another, but within each subculture itself there is harmony. Finally, she explains that the fragmentation perspective suggests that clarity does not exist on the organization level or within the subcultures, “placing ambiguity, rather than clarity at the core of culture…. [where] consensus is transient and issue specific” (p. 94). Ultimately Martin advocates that cultural researchers should incorporate all three of these perspectives into their research, as each perspective allows one to see aspects of the culture that the others may miss.

**Leadership and the learning culture.** Schein (2004) in his book, *Organizational Culture and Leadership*, also emphasizes the strong relationship between leadership and culture. He states that, “these dynamic processes of culture creation and management are the essence of leadership and make one realize that leadership and culture are two sides of the same coin” (p. 1).

Furthermore, he explains that “basically we do not know what the world of tomorrow will really be like, except that it will be different, more *complex*, more *fast-paced*, and more *culturally diverse*” which suggests that “*organizations and their leaders will have to become perpetual learners* (italics in original)” (p. 393). He suggests that a learning culture is necessary to promote the necessary flexibility and problem solving for organizations to survive and thrive in that kind of future, and that the leader’s primary responsibility is to create that learning culture.

Schein defines a learning culture as having the following ten dimensions: (a) “A proactivity assumption,” in which people respond to their environment by acting as
“proactive problem solvers and learners” (p. 394); (b) “Commitment to learning to learn,” in which members “hold the shared assumption that learning is a good thing worth investing in” (p. 395) and “value reflection and experimentation, and must give its members the time and resources to do it” (p. 396); (c) “Positive assumptions about human nature” (p. 386), which assumes people are essentially good, and that they can and will learn if provided adequate resources and support; (d) “The assumption that the environment can be dominated” and is malleable (p. 396); (e) “Commitment to truth through pragmatism and inquiry,” where leaders understand that they do not have all the answers and help others also “accept that there is much that they do not know. The learning task then becomes a shared responsibility” (p. 398); (f) “Orientation toward the future,” (p. 399) looking both at the near future to assess if solutions are working, but also looking at the far future to assess the larger implications of actions; (g) “Commitment to full and open task relevant communication,” in which “anyone must be able to communicate with anyone else and that everyone assumes that telling the truth as best one can is positive and desirable” (p. 40); (h) “Commitment to diversity”, wherein the organizational subcultures are connected and “value each other enough to learn something of each other’s culture and language” (p. 401); (i) “Commitment to systemic thinking”, with a leader that “believes the world is intrinsically complex, non-linear, interconnected, and…that most things are multiply caused” (p. 402); and, finally, (j) “Commitment to cultural analysis for understanding and improving the world” (p. 402).

Both Schein (2004) and Marzano (2005) indicate that leaders who hope to see reform efforts succeed in their organizations, have tremendous potential and responsibility to create the kind of organizational culture that is open, participatory, and
values constant learning. In the educational realm, it seems that this kind of school culture has the greatest potential to prepare students for a successful future in that increasingly complex, diverse, and technology-dependent world.

Summary

In conclusion, this study was guided by the major concepts from the transfer of learning literature. While this literature acted as the major lens of this study, the researcher remained open to any additional discoveries that emerged during the research process. The transfer of learning literature has focused on three key categories of factors that impact the level of transfer, originally outlined by Baldwin and Ford (1988), and followed by a number of subsequent researchers (Blume et al., 2010; Burke & Hutchins, 2007). These include the characteristics of the learner, the training design or interventions, and the work environment. While each of these types of transfer factors were explored to some degree in the research, this study focused primarily on the contextual factors in the work environment that were related to teachers’ initial and continued transfer of learning; in particular, aspects of technology, leadership and culture were most extensively explored. In the following chapter, specifics about the data collection and analysis processes will be discussed.
Chapter 3: Methods

Introduction

The purpose of this study was to examine one high school in depth to understand what contextual factors were related to the transfer of learning process of teachers as they participated in the eMINTS Program. Primarily qualitative research methods were used to identify the contextual factors in one particular high school and to investigate how these factors helped or hindered teachers’ ability to transfer their learning. Based on the exploratory and descriptive nature of the research question for this study, qualitative research was the most appropriate method for examining eMINTS Program participants’ experiences and describing the ways that aspects of the context, such as leadership and school culture, impacted teachers’ attempts at transferring these innovative teaching practices into their classrooms.

Research Design

The study used a single case study design, with Owenville High School as the unit of analysis, within the context of the entire district. As Creswell (1998) explains, the case study design allows the researcher to “use extensive, multiple sources of information in data collection to provide the detailed in-depth picture of” the specific case or cases (p. 37). The site chosen for this study was selected through “purposeful” or “theoretical sampling” (Heppner & Heppner, 2004), as this particular high school had implemented the eMINTS Program particularly comprehensively and successfully. It has been identified by members of the eMINTS National Center leadership team as an exemplary example of a high school implementation of eMINTS and has been showcased by the eMINTS staff multiple times.
Data Collection Strategies

Setting. The Owenville School District is a small, rural school district in the Midwestern part of the United States. The school district is situated approximately 30 miles away from a major state university and is comprised of an elementary, middle, and high school; each of these buildings is connected, forming one district campus. The Owenville School District has a total of 458 students, a certified teaching staff of 51 individuals, and it employs 8 support staff. The administration is comprised of an elementary building principal (grades K-5), a secondary principal (grades 6-12), and the superintendent. Owenville High School, in particular, serves 138 students and employs 18 full-time teachers. In the 2008-09 school year, approximately two-thirds of the students at Owenville School District received free or reduced food services. Less than 2% of students are ethnic minority students, and about 50% of students live in or near the town limits, with the other half residing in farming households.

Most of the Owenville teachers teaching grades 3-12 have participated in eMINTS Professional Development (PD). Several staff members who were new to the district this current school year (2010-2011) have not yet participated in eMINTS PD. The high school has at least one computer for every student enrolled in the high school, most of which are Apple Mac Book laptops, which are stored in laptops carts in the various classrooms. Each classroom also has an interactive white board called a SMART Board, access to a networked printer, and wireless Internet access. In addition, in order to better support the extensive amount of technology used daily at the school, in 2008 the high school building underwent a major renovation to update the heating/cooling systems and the electrical service.
**Participants.** The teachers and administrators at Owenville High School were the primary participants of the study. Nearly all the teachers at the high school have participated in the eMINTS Professional Development, including those who teach core subjects (mathematics, science, communication arts, and social studies), as well as some others who teach subjects such as art and business education. In addition, the Owenville School District employs a district eMINTS instructional specialist (eIS), who is also currently a communication arts and Spanish teacher, as well as the district curriculum director. All of these teachers, the curriculum director, the former and current superintendent, and the high school principal participated in the study. Sampling of participating teachers was not used for this study as the entire population of high school teachers at Owenville who participated in the eMINTS Program implementation was included in the study. In addition, some other teachers were also asked to participate as the data collection progressed and it appeared that their input might be relevant to the development of the case; these teachers included teachers new to the high school who had not yet participated in eMINTS PD and the high school Physical Education teacher who had been with the district for over a decade and had coached and team-taught health class with one of the eMINTS teachers. In addition, elementary and middle school teachers who had participated in eMINTS Professional Development were asked to complete an online questionnaire related to the district transfer climate as a whole. In all, 14 Owenville School District eMINTS teachers (including 8 high school teachers) fully completed the online survey, 16 administrators and teachers participated in in-depth interviews, and 8 teachers were observed teaching during at least one class period and participated in follow-up interviews.
**Data collection tools.** According to Creswell (1998), the case study design allows the researcher to use a variety of data collection strategies in order to paint a complex picture of the case. In order to explore the factors related to transfer of the eMINTS Program content and skills into the Owenville High School classroom practices, a variety of data collection strategies were used, including a survey, participant interviews, document and artifact analysis, and observations (of the district, school, and classrooms). As Yin (2009) explains, “no single source has a complete advantage over all the others. In fact, the various sources are highly complementary, and a good case study will therefore want to use as many sources as possible” (p. 101). Some initial exploratory interviews with the Owenville High School principal and the district eMINTS Instructional Specialist allowed the researcher to understand the overall district context and background of the eMINTS implementation project. The information these individuals provided helped guide the direction of the study and the final development of the interview questions for the teacher interviews.

**Learning Transfer System Inventory (LTSI).** As previously mentioned, all Owenville School District teachers who had participated in eMINTS Professional Development were asked to participate in taking the online version of the Learning Transfer System Inventory (LTSI), which was developed to analyze the level of impact various factors may have on the transfer process in a particular organization. Holton, Bates, and Ruona (2000) explain their motivation for developing the instrument; first, they note that most transfer studies have used their own specific scales to measure transfer, which cannot be easily compared from one study to another. In addition, “transfer research is at a stage where researchers need to move to more rigorously
developed and consistent measures of transfer variables…. From a broader perspective, defining and accurately measuring factors affecting transfer of training is important because it helps HRD move beyond the question of whether training works to why training works” (p. 337). They believe to achieve this goal that it is imperative to examine the entire “transfer system, which [they] define as all factors in the person, training, and organization that influence transfer of learning to job performance” (pp. 335-336). They based the initial version of the LTSI on a 63-item instrument by Rouiller and Goldstein (1993). After further testing, they then revised the instrument to more closely relate to the conceptual framework represented in the HRD Research and Evaluation Model (Holton, 2005; Holton et al., 2000; Holton, 1996), which “hypothesizes that HRD outcomes are a function of ability, motivation, and environmental influences at three outcome levels: learning, individual performance, and organizational performance. Secondary influences are also included, particularly those affecting motivation” (p. 339). Version 2 of the LTSI includes 16 total transfer constructs, which are divided into two parts: program-specific transfer constructs and general transfer constructs.

In order to validate the LTSI, version 2, Holton et al. (2000) administered the instrument to 1,616 trainees from a wide variety of organizations, including government agencies, for-profit organizations, nonprofit organizations, and public training classes, all of whom had participated in training ranging from topics such as technical skills, computer skills, sales/customer service, leadership/management, clerical, and communication skills. The developers of the instrument used exploratory factor analysis, specifically using the common factors analysis approach, to test the validity of the LTSI, version 2, which they note was the most appropriate type of analysis for the early stage of
scale development (Holton et al., 2000). They note that “scales developed to measure these sixteen constructs yielded exceptionally clean loadings and interpretable factors. Reliabilities were acceptable on all scales, with only three scales having reliabilities below .70 (.63, .68, and .69)” (pp. 354-355) (See Appendix F). Additional validity tests have been conducted on the instrument, as well (Holton, Bates, Bookter, & Yamkovenko, 2007; Holton, Chen & Naquin, 2003). Recently a third version of the LTSI instrument has been developed. Bates explains that the LTSI, version 3, still “measures all 16 scales, but with far fewer items (51 total items)” (R.A. Bates, personal communication, September 30, 2010). Version 3 recently has been tested for reliability and all 16 scales were found to have a Cronbach’s alpha rating of .70 or above (Bates & Holton, manuscript in preparation for publication).

Besides helping to create a standard measurement for future research studies, the LTSI is intended to aid organizations in diagnosing issues related to the transfer system. Holton et al. (2000) note that the results of the LTSI could be effectively used for collaborative planning with employees to identify barriers and implement interventions that may be able to improve the level of transfer. For the current case study, all members of the Owenville School District who had participated in eMINTS Professional Development were asked to complete the LTSI via an online survey tool. Of the 23 current Owenville teachers who had participated in eMINTS Professional Development, 14 completed the entire survey (for a 61% return rate). The results of the LTSI questionnaire were analyzed to identify areas in the school context that might need further investigation and also were used to triangulate trends identified from the analysis in other data sources.
**Teacher interviews.** Sixteen educators at the school district were interviewed in person using a semi-structure interview guide, which included a list of broad, open-ended questions (see Appendix B). All interviewees were also asked several basic demographic questions and also asked to respond to a broad opening statement that allowed them to explain their journey with the eMINTS Program at the district. They were specifically prompted to explain how various aspects of the work environment, such as leadership and cultural factors, may have helped or hindered their ability to initially implement and continue to use eMINTS instructional strategies in the classroom. Additionally, teachers were asked to give specific lesson examples where they incorporated eMINTS strategies into their lessons and what “Aha!” moments they experienced as their understanding of the eMINTS Instructional Model developed. Teacher interviews lasted approximately 30 minutes each and were conducted onsite at the Owenville School District after school or during teachers’ planning periods. Participants also were asked to be available by email or phone for brief follow-up or clarification questions.

**Administrator and eMINTS Instructional Specialist (eIS) interviews.** The Owenville School District administrators, specifically the current and former superintendents, and the high school principal were also interviewed in person using a list of broad, open-ended questions, which lasted between one to one and a half hours each (see Appendix C). They were asked to explore their perspectives on the transfer process, as well as to list specific actions they may have taken to help support the eMINTS implementation at Owenville High School. In addition, they were asked to provide more of the overview of the project, identify examples of teacher leadership they observed, and
discuss the long-term goals and strategies for the maintenance of eMINTS practices in the district.

The Owenville curriculum director who acted as the district eMINTS Instructional Specialist (eIS) also was interviewed and asked questions similar to the administrators regarding the background of the project, examples of teacher leadership and peer support, and her overall perspectives on the integration of eMINTS at the high school. She also acted as the district contact for the researcher during the data collection process.

In addition, the Owenville School District administrators and eIS acted as “key informants” for this study since they have a broad and wide-ranging view of the eMINTS implementation, school, and teachers. As Yin (2009) explains, these types of key individuals may not only be asked their perspective of the implementation, but they are also integral in helping to identify any other key people or sources of evidence that may help enrich the study. The researcher periodically talked with administrators at the district and the curriculum director to conduct member checks throughout the data collection and analysis phases of the project; these conversations were integral to the research to verify factual information and as well as gain insight on the validity of emerging themes.

**Observations.** All Owenville High School teachers responsible for teaching core subjects (mathematics, social studies, communication arts, and science) were observed teaching during one class period (approximately 50 minutes). The goal of these observations was to allow the researcher to gain firsthand information about the type of instructional strategies occurring in these high school classrooms. This information allowed the researcher to verify information regarding classroom practices and level of
eMINTS integration that teachers self-reported during their one-on-one interviews. Yin (2009) explains the following:

Observational evidence is often useful in providing additional information about the topic being studied. If a case study is about a new technology or a school curriculum, for instance, observations of the technology or curriculum at work are invaluable aids for understanding the actual uses of the technology or curriculum or any potential problems encountered. (p. 110)

A semi-structured observation guide, which was developed based on eMINTS classroom look for’s for principals developed by the eMINTS National Center, were use to provide some consistency in observations (See Appendix D). During each observation the researcher spent the class period typing notes from the back of the room, recording as much as possible in real time of the activities occurring in the classroom; information recorded included what the students and teachers were doing and saying, the structure of the activities, the content of the lessons, information about the setting, and what types of technology were being used. Following each observation, the researcher reviewed the notes, filled in gaps, and then filled in the information for the seven categories in the template. In addition, a list of follow-up questions were listed at the end of the document, such as what type of assessment would be used for the lesson, information about the make-up of the students in the particular class, etc. The researcher was able to follow up with all the teachers either on the same day as their observation or during her next visit to the school to get the questions answered. These answers were also recorded in the final observation notes.

In addition to the classroom observation, the researcher spent time observing the teachers and administrators in other parts of the school, such as the high-school and
superintendent’s office, the school hallways, the teacher’s lounge, and so forth. The researcher also observed a faculty meeting of the middle and high school teachers. Once again, these additional observations were used to verify and triangulate information reported in the one-on-one interviews, regarding topics such as the school culture, teacher interactions, and administrator interactions, and so on.

**Document analysis.** The final method of data collection was document and artifact review: “For case studies, the most important use of documents is to corroborate and augment the evidence from other sources” (Yin, 2009, p. 103). Each interviewee was asked to provide any supporting documents or artifacts that they believed might be helpful to provide additional understanding about the eMINTS implementation at Owenville. Many teachers provided lesson plans and student handouts for lessons that were either mentioned in the interviews or that the researcher was able to observe. In addition, other artifacts collected included URLs to the teachers’ classroom websites, agendas from professional development sessions, and lists of when teachers were trained in the eMINTS PD program. Finally, the current superintendent at Owenville had recently completed his dissertation, which used the Owenville School District as his target of study. Therefore, information in this document was especially important for background on the district and to help triangulate information from the other data sources in this study.

**Trustworthiness**

In order to address issues of trustworthiness, this study included a variety of procedures to ensure credibility and dependability of the study. Those terms are discussed
briefly below and a discussion of procedures used to address those issues and their relevance to this study follows.

**Credibility.** To establish the credibility of a qualitative study, Creswell (1998) suggests that the general concepts of trustworthiness and authenticity should be addressed. Credibility in qualitative research is roughly equivalent to the concept of validity in quantitative studies. Essentially, the researcher gains credibility for the study by providing a compelling case with evidence and reasonable insights for the study's interpretations and conclusions.

**Dependability.** For qualitative studies, dependability is roughly equivalent to the issue of reliability in quantitative studies. The researcher must ensure that the procedures used throughout the study help to minimize any possible biases. Miles and Huberman (1984) suggest that qualitative researchers should not only report on the details of the case examined, but also thoroughly document and report on the procedures of the data collection and data analysis processes. The following section discusses a variety of strategies qualitative researchers can use to address the issues of credibility and dependability, as well as addressing their implications for this particular study.

**Prolonged engagement.** Creswell (1998) discusses a variety of procedures that may be used by the qualitative researcher to address issues of verification in research, including the following: prolonged engagement; triangulation; peer review; negative case analysis; clarifying researcher bias; member checks; rich, thick description; and external audits. The first one, “prolonged engagement and persistent observation,” (p. 201) suggests that the researcher spend significant time with participants and in the study context. This extended time helps the participants to develop trust in the researcher,
which can improve the quality of data collected, and the greater overall understanding of
the context can improve the quality of interpretations of the data. In the present study, the
researcher was able to spend a significant amount of time at the school, over two months,
collecting data. In addition, the researcher had visited the school several times in the past
few years and had talked many times with the key informants and other teachers, which
helped to establish a basis of trust for the study.

**Triangulation of data.** Another way to address the issue of credibility in
qualitative studies is to use multiple sources of data to help paint a rich, detailed picture
of the case and corroborate evidence (Yin, 2009; Creswell, 1998): “Typically, this
process involves corroborating evidence from different sources to shed light on a theme
or perspective” (Creswell, 1998, p. 202). In this study, data was collected through a
questionnaire, observations, document collection, participant interviews, and existing
data. In addition, different types of participants were interviewed, including teachers who
were the direct professional development participants, some teachers who had not yet
participated in the eMINTS PD, the administrators of the district, and the district
eMINTS Instructional Specialist who conducted the majority of the eMINTS PD and
coaching visits with the Owenville teachers. Each of these groups was able to provide a
different perspective on the eMINTS journey in the district. Using these different types of
data sources allowed the researcher to create a more holistic view of the case.

**Peer review or debriefing.** Having a fellow researcher involved in the data
analysis and interpretation as an external check point can help minimize possible biases
that might otherwise occur with only one research working in isolation. This peer
researcher should be someone who “keeps the researcher honest; asks hard questions
about methods, meaning, and interpretations,” (Creswell, 1998, p. 202) and may simply provide a sounding board for working through challenging stages of the research process. In order to ensure that the researcher was analyzing the data fairly, for the present study, a peer researcher analyzed 2 of the 16 in-depth interviews that had been transcribed (approximately 13%). The researchers consulted and compared coding their categories and made adjustments to resolve differences. This strategy was used to help improve the accuracy of the analysis and reduce biases that may occur when only one researcher analyzes data in a study.

**Negative case analysis.** Creswell (1998) explains that in this procedure, the researcher is constantly revising his or her hypotheses as the study advances, especially in light of negative, disconfirming, or conflicting evidence. In the Owenville case study, the researcher used the spiraling technique during the data collection and data analysis processes. As interviews were conducted, they were immediately transcribed and reviewed. This allowed the researcher to constantly develop themes and hypotheses, and investigate those in subsequent interviews and observations.

**Member checks.** Member checks, or getting feedback from the participants of the study, are another method of ensuring the accuracy of the data collected (Miles & Huberman, 1984; Creswell, 1998). This procedure “involves taking data, analyses, interpretations, and conclusions back to the participants so that they can judge the accuracy and credibility of the account” (Creswell, 1998, p. 203). In this study, the researcher used follow-up questions with all participants when the meaning of any information provided seemed unclear or ambiguous. In addition, the study’s key
informants at the district (the district eIS and administrators) were asked to review the preliminary and overall findings to see if they rang true.

**Rich, thick description.** Providing rich, thick description means providing the reader with as much detail as possible in the case study report, including details of participants and the context explored in the study. This type of description is essential in a qualitative study to allow for transferability, which means that the reader is able to decide which elements of this particular case may be transferrable or relevant to other settings based on their similar characteristics (Creswell, 1998). For the current case study, the researcher collected overall district data through a questionnaire administered to all eMINTS teachers in the district and observations of general activity in the buildings. In addition, all Owenville High School teachers who had participated in eMINTS PD, administrators at the district, and additional teachers were interviewed in depth about their experiences. These various and comprehensive sets of data allowed the researcher to paint a rich and vivid picture of the implementation of eMINTS at Owenville High School (see Chapter 4).

**External audit.** Creswell (1998) explains that an external audit for a qualitative study means allowing an individual, not connected to the study, “to examine both the process and the product of the account, assessing their accuracy” (p. 203). Yin (2009) suggests that developing a case study database may be one way of helping to create an audit trail, which allows the data, notes, and reflections in a place separate from the final (and more limited) report. In this study, the researcher used NVivo 9 qualitative analysis software to store all information related to the study— interview transcripts, observation notes, documents, researcher field notes and reflections—in one place. In addition, the
researcher used the project log function available in NVivo 9, which automatically keeps a record of all activity in the project file, to provide an audit trail.

**Researcher Perspective**

All research requires the researcher to make a wide variety of choices during the design and implementation of a study. These choices are necessary in order to limit the scope of the research to focus on particular questions of interest and narrow the information included in a final report to a manageable amount; however, they also provide opportunities to introduce biases. All researchers must reflect on their own assumptions and personal experiences, which may influence the particular choices and interpretations they may make, to minimize any negative impact on the study. As detailed above, a number of research procedures can help minimize the negative impact of those potential biases.

For the particular case study presented here, the researcher was involved with the professional development program being studied in a variety of roles over the past decade, originally as an eIS and currently as the eMINTS Program Director. This extensive history with the program has certainly impacted the design and focus of the present study, in that there are particular assumptions made about certain factors influencing the transfer in this particular setting. For example, from previous schools and from this school district in particular, the researcher has seen how leadership has played an influential role in the successful implementation of eMINTS. However, this knowledge was used to explore that (and other) assumption(s) about the study. In addition, the researcher ensured that all participants in the study were fully aware of her position with eMINTS and she urged them to answer as honestly as possible (both about
positive and negative information related to the program implementation). Participants were reminded both at the initial informational meeting about the study to gain informed consent and prior to their individual one-on-one interviews, that one particular goal of the study is to figure out what works and what does not work for the program, so it was imperative that they note any problems as well as successes in their experience with eMINTS. Overall, the researcher’s previous experience with the program and the district helped in her ability to both attune to relevant data and accurately interpret the data.

Data Analysis

The LTSI survey was completed using an online survey program called Survey Monkey. This allowed teachers to complete the surveys anonymously. The data was then filtered into two sets—one that included the results from all completed surveys from teachers at any level in the district (elementary, middle, and high school teachers) and the other with only the answers from the high school eMINTS teachers. These data files analyzed using SPSS software to determine the scores for each individual for each of the 16 transfer constructs measured by the LTSI. The average ratings and reliability estimates (Cronbach’s alpha) for the two groups of teachers (whole district and high school only) were then calculated (see Appendix E). The data were used to inform the researcher about particular areas of interest to investigate in the study based on especially high or low ratings. The following scale provided by Dr. Reid Bates (personal communication, February 03, 2011) was used to guide the researcher’s interpretation of the scores: less than 1.9 extremely negative, 2.0 - 2.4 negative, 2.5 - 3.4 neutral, 3.5 - 4.0 positive, and 4.1 - 5.0 extremely positive. The survey data results were used primarily to triangulate the information gained from other data sources.
The data collected from the interviews, observations, and document analysis strategies was analyzed in order to understand the integration of the eMINTS Instructional Model into Owenville High School teachers’ instructional practices. Data analysis occurred not only at the end of the data collection process, but also throughout the study in order to help guide the researcher in further understanding the case and to help develop additional questions that need to be explored. In order to conduct the study as efficiently as possible, interviews were transcribed immediately after they occurred, rather than waiting until all interviews were completed. The qualitative software package NVivo, version 9, was used to help manage and organize the data for analysis. As Creswell (1998) suggests regarding qualitative research, a data analysis spiral may be most effective as the researcher moves from collecting to managing to analyzing data throughout the research process. The researcher analyzed the data using an open coding process, which allowed the researcher to identify types of the variety of themes that emerged related to barriers and drivers of transfer of learning in the case study. The researcher used a categorical aggregation approach, in which the “researcher seeks a collection of instances from the data, hoping that issue-relevant meanings will emerge” (Creswell, 1998, p. 154). An additional researcher assisted with validating the coding process by independently coding approximately 13% of the data and comparing to the primary researcher’s coding. Adjustments to coding categories were made based on the comparison of the two coding processes. During the data analysis process, the researcher explored the patterns and themes that emerged between the various data sources.

**Conclusion**
In conclusion, the study employed a single case study methodology, using primarily qualitative methods, to study the transfer factors that influenced the implementation of the eMINTS Program at Owenville High School. The primary sources of data collection were an online survey, semi-structured interviews with district teachers and administrators, observations of classroom teaching, and, finally, document and artifact analysis. All these data were used to develop an understanding the eMINTS implementation process at Owenville High School, and identify what particular contextual factors acted as drivers or barriers to teachers as they attempted to transfer their learning into their classroom practices. The following chapter outlines the key findings identified in this case study research.
Chapter 4: Findings

Introduction

The findings of this study are based on the variety of data collected, including an online survey, in-depth interviews and follow-up with participants, district and classroom observations, and relevant documents and artifacts. The first part of this chapter is presented chronologically, while subsequent sections will present the findings thematically. Specifically, the primary sections included are a detailed timeline of the eMINTS implementation at Owenville School District, followed by the major findings regarding the factors related to the teachers’ transfer of learning of the eMINTS Program concepts into classroom practice at Owenville High School.

Timeline of eMINTS Implementation

The process of implementing eMINTS at the Owenville School District has been a long and steady progression, which continues to this day. The effort was a highly collaborative one—teachers, administrators, students, parents, community members, and school board members were all involved. This section will take the reader through the highlights of the reform efforts that eventually incorporated eMINTS across the entire Owenville School District, as well as helped to demonstrate the efficacy of the eMINTS Program at the high school level.

Leading the charge for school reform. The first priority for the now-retired superintendent when she arrived at Owenville School District nearly two decades ago was to identify the major problems that needed to be addressed in order to improve the student outcomes of the district’s students and to get the faculty actively involved in
finding solutions. She consulted with the building-level administrators, the teachers, and even students and parents. She facilitated discussions to clarify the goals for students, which included improving reading and mathematics in the elementary school to better prepare students for middle and high school, increasing student engagement district-wide, increasing graduation rates, and ensuring students developed the 21st Century skills they would need to be successful after graduation. She sent faculty to conferences and to other schools that were implementing innovative programs and then asked them to bring those ideas back to discuss with one another. However, although teachers and administrators suggested many exciting reform ideas, many early attempts at school reform were unsuccessful. For example, an attempt to implement a program called Breaking Ranks that seemed promising initially quickly fell apart. “It seemed like everybody would come back—oh, that’s really great for our school—and then three months later it had kind of died. We went through so many reforms” (District-level Administrator).

However, after one particular statewide conference in the fall of 2004, the faculty seemed to gain some momentum in their planning efforts. Following the conference, the superintendent instituted voluntary weekly meetings for one month so the teachers could share what they had learned and discuss any other ideas they had for helping improve teaching and learning in the district. While these meetings were voluntary, they consistently had high attendance and continued on well past the planned initial month.

I told them we would meet one hour every Monday for the month of November. It ended up we met November, December, January, and February—I think it was February we met with student councils. The teachers wanted to bring the kids in…. I thought I might have five people there, I had twelve to fifteen every week, and… our hour extended to bringing in Subway sandwiches, ordering Casey’s pizzas, because we would be there, and it was just, “What do you need the rooms to look like?
…What do we need to make this fit what the real world looks like? And I tell you they got so excited!” (District-level Administrator)

The group began to look toward integrating technology as something that might improve the students’ 21st Century skills, increase their engagement in school, and help them develop broader perspectives and ideas about the possibilities for their futures.

We had high poverty in our school; it became more so especially after the floods, and I came with the flood. And so we were trying to find ways to broaden our kids' horizons and let them have a larger world view and their place in it, and technology just seemed the way to go. (District-level Administrator)

At the high-school level specifically, student lack of engagement was identified as a major problem. In addition, although some of their efforts thus far had worked to increase graduation rates and increase overall college admissions for Owenville High School graduates, as an administrator explained:

Most of them were home second semester. They didn’t have the social skills, they didn’t have the coping skills, they couldn’t function out in that world. And so we thought, "We really need to make an effort to help them find a place in that world so they are successful.” (District-level Administrator)

The introduction of technology and more collaborative, student-centered teaching methods seemed like something that could help address some of these challenges.

**Introducing technology in the classrooms.** When the decision to find a way to bring more technology to the school district was made, some faculty who were aware of the eMINTS Program suggested that they look at implementing it as their school reform effort, at least at the elementary level where the program had initially been developed and had been found to provide significant improvement in student achievement. However, implementing the eMINTS Program posed several challenges. The cost of the program
was a significant barrier, in that it required a large amount of classroom equipment (including interactive white boards, called SMART Boards, in each classroom and large numbers of student computers) and significant hours of professional development (which required both participation fees and teacher stipends). Some grant funding was available for districts in the state through the federal Enhancing Education through Technology (EETT) Program, which was implemented through the Title II.D Program. Owenville School District did apply for that grant to implement eMINTS in their third and fourth grades, but their efforts were initially unsuccessful.

So, the group decided that while they would continue to look at writing another Title II.D grant for the next year, they would develop a customized technology plan. Some members of the group had heard about a handheld initiative being implemented in the state, which would get technology into the classrooms at a significantly reduced cost. “Initially we were trying to go with… laptops for high school students, the handhelds we were using at middle, and then to really lay the framework for it we looked at eMINTS for upper elementary” (District-level Administrator).

The leadership team presented their plan to the school board and received approval to put handhelds in the fifth- and sixth-grade classrooms and create eMINTS-like classrooms in the fourth grade classrooms, installing interactive whiteboards, but no student computers or eMINTS Professional Development. The teachers involved also received some initial training on the basic use of the equipment.

After a year of this implementation, the administration solicited feedback from teachers, students, and parents about their impressions of the handhelds and interactive whiteboard technology. The teachers believed that the new technology was engaging the
students more and said that discipline problems had noticeably declined. The teachers
used the interactive whiteboards to bring videos, websites, and other resources from the
Internet into the classrooms. Students used the handhelds to write papers, read
information, and practice skills through educational games. However, while the students
and parents were very positive about the new technology, the teachers did not notice any
significant gains in students learning. The teachers also found that the handhelds were
somewhat limited in their usefulness as few applications were available for them at that
time, the small size made the writing process difficult, and keeping them charged was a
challenge. In addition, the administration noticed that teachers were still teaching in a
highly traditional, teacher-directed way; students were not using the SMART Boards,
only the teachers. Essentially, classroom instruction looked very similar to the way it had
looked prior to introducing the technology, and teachers continued to work highly
independently, without much peer collaboration.

The feedback led the planning group to re-evaluate their technology integration
efforts—it appeared that the introduction of technology in itself was not sufficient to
change the kind of learning that was taking place. They wanted to find ways of changing
the actual classroom instruction to become more meaningful and student directed. The
group decided to look again at finding a way to implement the eMINTS Program,
because the program not only involved the technology, but a focus on student-centered,
inquiry-based learning “I really [saw] the inquiry type of concept, and the technology
only allows you to do that” (District-level Administrator). Some staff even began to think
that eMINTS might be appropriate to help address the key issues identified at the high-
school level, as well. “The more we saw, I remember somebody sat there at a meeting
and he leaned back and he says ‘I think eMINTS is what we’re trying to do, at the high school, too’” (District-level Administrator).

However, convincing all the teachers that eMINTS could also work at the high school was a challenge. Thus far, only a few high schools had tried to implement eMINTS with older students who had more complex content to master and highly structured schedules. Many teachers had a hard time visualizing how it could work at that level, so the district sent some staff to these schools to observe. In addition, they became aware of the nearby university medical school’s successful problem-based learning (PBL) program, which was a highly student-centered, inquiry-based approach to teaching complex medical school content. So the high school principal, curriculum director, and several teachers visited the medical school to observe their program. They came back excited about the possibilities and holding a much better understanding of what it might look like with older students and more complex content. They shared their experiences with the other teachers and also suggested that the district send additional groups of teachers to observe firsthand, which it did.

As the Owenville faculty became more convinced that they wanted to implement inquiry-based learning into their classrooms, the next step was to revise their long-term school reform plan and their grant application to include eMINTS at all levels. While they hoped to be awarded the Title II.D grant this next time, they also decided that they would not allow their plan to be wholly dependent on whether or not they received the federal funding. They decided to use currently available funds to have a teacher participate in the eMINTS Professional Development for Educational Technology Specialists (PD4ETS) Program, a “train-the-trainer” program, which allowed district staff
members to become certified eMINTS Instructional Specialist (eIS) over the course of two years. The superintendent asked the curriculum director if she would attend the eMINTS PD4ETS program to become the district eIS to implement the eMINTS training. While the curriculum director was initially hesitant about leaving the classroom part of the day to take on that role, she eventually realized that it was the best solution to make sure their plan could move forward. She thought her participation in the program also might help the district strengthen its Title II.D grant application by gaining better insight into the program and demonstrating a strong district commitment. The next step in the plan was to gain school board approval to make the changes that would be necessary:

> It was a seven year plan, what we needed for building, what we needed financially, what we needed so that we didn’t start it and it died, or somebody left and it died. If we wanted true reform,…this was what we needed to do. Our bond issues were set within that, so that we could make the high school building look like the teachers said we needed it to look like. (District-level Administrator)

**Implementing the plan.** Once the school board approved the plan to implement eMINTS across the district, the next step in implementing the plan and writing the grant was to decide who would participate in the first round of professional development. The leadership team, which included the district-level and building-level administrators, as well as the curriculum director, outlined the criteria for participating teachers. They identified four main criteria for choosing teachers to participate, which included the teacher’s willingness to try new things, a high degree of self-confidence, high level of commitment, and an overall representation of the various grade levels and discipline areas. The leadership team then asked for teachers to let the team know if they were interested in participating, and from a pool of 15 teachers who volunteered, ultimately 11
were chosen to participate in the first training group. This group included 3 elementary teachers, 4 middle school teachers, and 4 high school teachers. They included teachers who taught various core subjects, including communication arts, social studies, mathematics and science. The teachers were given a choice about which program they felt they could commit to—the more intensive eMINTS Comprehensive PD Program or the smaller version of the program called eMINTS4All. Then the leadership team, with the help of additional teachers, wrote the Title II.D grant based on the plan they had developed and submitted it in the spring of 2006, with an understanding that they would begin implementation with their district eIS whether or not they were awarded the grant. However, when the Owenville staff learned that they had received the federal grant, they were ecstatic, as it would accelerate the eMINTS implementation substantially. “It cut three years off of our seven year plan. And, you know, seven years may not seem like much, but seven years in the life of a child…but [the grant] really helped” (District-level Administrator).

**Beginning eMINTS Professional Development.** In the fall of 2006, the two-year grant implementation began as the 11 teachers started their eMINTS Professional Development. Those teachers in the eMINTS Comprehensive Program worked with an eMINTS Instructional Specialist (eIS) who was employed by the eMINTS National Center, and the eMINTS4All teachers worked with the district curriculum director as she completed her second year of the eMINTS train-the-trainer program. The curriculum director noted that at first she believed they would not need the help of the outside eIS since she believed they could implement the program on their own. However, the eMINTS National Center leadership insisted that the implementation was too large for
the district to do on its own. As the curriculum director got more involved in the large-scale implementation process, she realized the wisdom of having the eMINTS staff person, who was highly experienced in the program, working with them.

Both the curriculum director (acting as the district eIS) and the eIS who was an eMINTS staff member worked with the teachers in their training sessions, which were focused both on technology use and on the various aspects of teaching strategies that comprised the eMINTS Instructional Model, which emphasizes Inquiry-based Learning (IBL). Both eISs also visited the classrooms of the teachers in the program about once a month to provide coaching and mentoring to them as they began trying to transfer what they were learning into their classroom instructional practices. Sometimes they met with individual teachers one-on-one to help plan an upcoming lesson or follow-up on content from a professional development session. Other times the eISs would visit teachers when the students were in the classroom and provide assistance in a variety of ways—to help out with the lesson, observe the classroom to provide feedback later, or sometimes help with the technology:

I liked those, because then, she was an extra set of hands, she was an extra set of eyes, you know, sometimes she could see things that I didn’t see, or she could help when I didn’t know how to answer a question related to maybe the technology..... Helping you get a little more comfortable with what you were doing, or provide suggestions and say, you know, this time, or next time try this, or to talk to her about it ahead of time, she sometimes could foresee that there might have been a problem or something that you might address differently. (Teacher 10)

While some teachers felt more comfortable than others having another person in their room while they were teaching, all the teachers found the one-on-one support from their eISs helpful. Most also found the professional development sessions to be useful
and well structured, although the eISs did make some adjustments at times based on the prior knowledge of the teachers for particular topics. The teachers appreciated that they had time between their sessions to try out what they had learned before moving on to the next topic, and they enjoyed having the whole professional development schedule at the beginning to know which topics would be addressed:

[The eMINTS PD materials] were extremely helpful. I think it gave a focused, structured way [to progress], and it also helped the teachers not get too frustrated with themselves, because they knew if they didn’t have that skill yet that it was coming in a different module. (District-level Administrator)

Several participants in the study also mentioned that having the training onsite at the district was a real advantage, since that meant that the teachers did not have to spend additional time traveling to another location, which would take more time out of their lives. This was an especially important factor for several teachers who had young children.

Teachers also mentioned that having the groups mixed with elementary and secondary teachers offered some pros and cons. On the negative side, many teachers said that it would have been more productive to be in eMINTS sessions with teachers that had more similarly-aged students:

One of the things that they had relayed to me about the training initially, they preferred, and they thought it was important to be more, not subject similarities, but age groups similarities. That was one of the big, big suggestions they would have during the training. If you trained all the high school teachers together. It was hard to have a high school teacher and some elementary teachers and use [the same] samples or examples. (District-level Administrator)
On the other hand, the mixed groups had some positive unintended consequences, as well. Prior to the training, the teachers from the elementary school and the secondary schools rarely interacted:

I really think that the eMINTS and the inquiry have kind of helped glue all of our teachers together….When I first came here, there was a very strong wall between elementary and the middle school/high school….We have finally got to the point where, because the eMINTS, they’re all training together, sitting through the training, they’re all working together, coming up with ideas, so that’s really helped bridge the gap. (District-level Administrator)

As the Title II.D grant period progressed, administrators and teachers began to notice some changes to Owenville. First, those teachers involved in the training significantly increased their understanding of the components of a successful eMINTS classroom:

At first everybody was interested in the technology. Boy, you know, we’ve got, we’re going to get laptops and SMART Boards, and that part of it was our initial excitement about the program, but then as we got into the professional development part of it we really learned what eMINTS was all about, and it’s not the technology part of it, and it’s the professional development and the changing of the way you instruct kids, and the way you integrate technology into the classroom. (Building-level Administrator)

In addition, many teachers had begun to incorporate many of teaching strategies into their classrooms. Many teachers developed and implemented lessons that involved real-world problems, allowed the students to be highly self directed, to work in cooperative groups, and to make use of the technology resources.

In addition to changes occurring in the classrooms, the way teachers interacted and worked with one another changed significantly. The level of teacher collaboration and collegiality began to increase dramatically as teachers got to know one another more
in the sessions. As teachers became more used to sharing lesson ideas and providing each other with feedback in their professional development sessions, they also became more comfortable seeking help from one another or planning together outside of the sessions. At the high school, the teachers collaboratively developed several large-scale, interdisciplinary problem-based learning (PBL) lessons. These lessons were developed based on knowledge they had gained through eMINTS Professional Development and with additional guidance from the medical school faculty:

Last year we did have quite a bit of collaborative time, where we’ll group them in teams, various subjects, and they’ll work on a particular large problem-based learning project, that maybe we’ll do class-wide, and all those core subjects will be involved, or all of those subject areas, not core subjects, will all be involved in writing the particular [lesson]. (Building-level Administrator)

Nearly every teacher interviewed cited this new high level of collaboration among staff as one of the biggest changes in the district, from the eMINTS implementation to the present time, and also cited it as one of the most rewarding changes. The administration noticed the significantly higher levels of teacher collaboration, as well an overall increased focus on teaching and learning among the staff: “When I caught the coaches viewing classroom tapes, instead of basketball tapes, that was a winner!” (District-level Administrator).

Teachers and administrators also observed some of the positive changes for students that they had hoped to achieve. Student engagement increased significantly, parent involvement increased noticeably, students’ technology literacy and other 21st Century skills greatly improved, and student academic achievement improved. In the year following the completion of the grant, the Owenville School District was officially
recognized for the gains in academic gains they had made in student achievement by being cited as a “Distinction in Performance” district by the state’s educational agency. In addition, as of the current 2010-2011 school, their website also notes that they have 75%–80% of their high school graduates attending post-secondary educational institutions.

**Sustaining the district’s eMINTS implementation.** After the first year of the grant, the district eIS started another five teachers in eMINTS PD. Since then, the district has always had at least one active eMINTS Professional Development group. The most recent group will finish their two years of eMINTS Comprehensive PD this spring. This group combined several teachers that were new to the district last year with some teachers who had received only eMINTS4All training originally, to allow them to finish the full eMINTS Comprehensive PD Program.

At this point, 22 teachers in the district have participated in the eMINTS Professional Development at Owenville, which includes all the core teachers, except a couple of teachers who are new to the district this school year. Some non-core teachers, however, such as the music and physical education instructors, have not participated in the professional development at this point. Those who have gone through the professional development continue to actively use the eMINTS equipment and instructional strategies in their classrooms, although the way and the degree to which each individual teacher incorporates them into their classroom widely varies. At the high school, in particular, the administration sees a high degree of eMINTS teaching methodology in use:

I would say that our involvement with eMINTS strategies and inquiry-based instruction is pretty much fully integrated throughout the 6-12 staff. I mean, there’s (sic) a few exceptions, but I would say that many of those
strategies are used daily, hourly, by a lot of our teachers. (Building-level Administrator)

Interestingly, in the initial interviews for this research, teachers were asked to describe their level of eMINTS integration into their teaching. Based on the subsequent observations conducted, the self-assessments provided by the teachers appeared highly accurate. Teachers seem to know what eMINTS teaching looks like and be highly self-aware about the degree to which they are using those strategies versus more traditional teaching styles.

The administration continues to convey the message that the eMINTS teaching and inquiry-based learning strategies are an important part of the district’s identity. Teachers new to the district noted that they were asked during their hiring interviews about their knowledge of eMINTS and their willingness to participate in eMINTS Professional Development. Additionally, monthly eMINTS collaboration meetings are held for veteran teachers (those eMINTS teachers who had already completed their full eMINTS PD) to attend on a voluntary basis, and the veteran teachers often take on the role of mentoring the teachers that are newer to eMINTS and inquiry-based learning. Recently one teacher that has been a leader at the development of the PBLs and eMINTS lessons has been given a formal assignment to mentor other teachers, allowing him to be available one hour everyday to help them develop their own inquiry-based lessons. In addition, the curriculum director continues in her role as the district eIS, training new teachers and remaining available to all the teachers to help them work through lessons or provide other support:

I think a lot of that, like I said, goes back to [the curriculum director]… with keeping things going, and keeping—our veteran teachers, our veteran
eMINTS people, as being kind of mentors to our people that are being certified now, kind of being there for them to support them. (District-level Administrator)

Going forward, one of greatest concerns for the administration and teachers is simply the aging of the equipment, and the cost of its replacement. They continue to buy some new laptops each year, but the current rate of replacement puts them on about a five-year replacement schedule. Nearly all of the original laptops purchased with the Title II.D grant are still operational and as new equipment is purchased, the older equipment is passed on to classrooms that have not had much technology. They realize that more new equipment will eventually need to be purchased when the current equipment dies or can no longer support the more current software:

The programs that are coming out… they’ve become so demanding that the technology that you have, well you can’t use it on this computer, you have to get a new computer, type thing, but that’s the nature of the beast, I guess. (District-level Administrator)

Dimensions of Context and Their Relationship to Transfer of Learning

Introduction. Although most of the teachers at Owenville School District have participated in eMINTS Professional Development, simply completing the professional development is no guarantee that teachers will actually use what that have learned in their classrooms. As the transfer of training literature suggests, a wide variety of contextual factors may have an impact on any particular individual’s level of implementation back in a work setting. As previously noted, the level of transfer in Owenville High School classrooms overall is fairly high, based on both assessments from teachers, administrators, and eMINTS National Center staff members. The primary focus of this study was to explore the factors in the school context that may have helped or hindered this implementation process, with a particular emphasis on the role of leadership and
culture at the school. After analyzing the data thematically, a number of major factors were identified as relating to the transfer process. First, many people were cited as impacting teachers’ decisions to use their training, including the administrators, the eMINTS Instructional Specialists (eIS), teachers at the school, and finally the Owenville students. In addition, factors related to the technology had both positive and negative influences on teacher transfer. This section explains what the data showed about the relationship between these contextual factors and the ability of teachers to transfer the knowledge and skills from their eMINTS Professional Development sessions into their instructional practices.

Leadership factors. An analysis of the data collected strongly indicated that the administrators at the district were a huge positive factor in the implementation of eMINTS and that they used a wide variety of strategies to help facilitate the transfer of learning. As will be described in detail below, they provided high levels of support and resources to the teachers, consistently conveyed a sense of importance for the initiative, and, over time, created a school climate that reinforced the continued use of the eMINTS strategies.

Setting clear expectations for the importance of the program. From the first discussions of bringing eMINTS to Owenville High School, the administrators were intimately involved in the process, which signaled to teachers that this was a district priority. Many interviewees identified the administration’s leadership of the program implementation as a motivator for them to personally use the eMINTS instructional strategies in their own classrooms:
I would say, without our administration, or at least their attitude, this would never have worked. Because they were very open, really they were the driving force behind it I would say…. I mean, we had the choice to do it, but it was also sort of made known that if you did sign up for it that you needed to at least try it and see how it works for you. (Teacher 6)

The administration also followed that initial support with other actions to make sure the expectations for teachers were clear. Nearly all the teachers interviewed mentioned that although not done in a heavy-handed way, the administrators were clear that the teachers were supposed to be using the technology and inquiry-based instructional strategies. “They talk it up and I think just let it be known that it’s important and that’s something that we do here” (Teacher 1). The administration also used staff meetings to emphasize the priority of the program: “It’s always talked about. I mean it’s just one of our, you know, like on the checklist of a meeting, it’s always something that’s mentioned” (Teacher 9).

The administration formalized their expectations of seeing eMINTS instructional strategies in the classrooms by aligning performance evaluations to make sure they were appropriate to the evaluation this new type of teaching:

We even rewrote our expectations for our evaluations, we did that to incorporate the eMINTS and the 21st Century [skills]…for teacher evaluations, for principal evaluations, that this is an expectation for the district, that, you know, we want students engaged, we want students successful. (District-level Administrator)

Another way the administration signaled the importance of the program was to continue making eMINTS Professional Development a priority: “They show that it’s a priority. I mean, even this year, almost all professional development was cut out of our budget…, but eMINTS is on there at the top. (Teacher 1)
Not only did the administration encourage staff to be involved at the beginning of the eMINTS implementation, but they continued to indicate the importance of teaching this way: “They’ve stayed very involved in that, which I think is a good thing. It’s not one of those phases we’ve just gone through and now we’re finished with. You still feel like you should teach that way.” (Teacher 6)

*Shared leadership and collaborative decision-making.* The leadership not only spearheaded the original school reform efforts, but they generated buy-in from the various stakeholders by making the decision-making process a highly collaborative one. As previously mentioned, the teachers were highly involved in identifying the academic issues that needed to be addressed and then brainstorming solutions, and ultimately deciding as a group to adopt the eMINTS Program district-wide. This level of involvement went a long way to securing buy-in from the wide variety of stakeholders:

> I think the critical skill in leadership… is how do you put feet under good ideas? It walks among the teachers and the kids. So... you need to bring everyone in together and really sit, and think it out, and then try to get all the pieces. (District-level Administrator).

Besides involving many people in making decisions, several teachers noted that once those decisions were made, the administrators were effective delegators. For example, the curriculum director noted that not only was she asked to provide the professional development for the teachers, she was also asked to take on the lead role in eMINTS planning and coordination at the district:

> I’m sort of the coordinator and not just the trainer. Pretty much everything that happens with eMINTS comes back to me... they ask me to recommend who should we bring in next, all those sorts of things, what’s the next batch going to be, and what’s the budget going to be for eMINTS the next year, and all of those things. I’m kind of the point person for that. (Teacher 1)
Another teacher recalled when he had an idea to raise funds through a concert to get graphing calculators for the high school classrooms. He explained how the administration was able to strike a good balance between allowing him to take the lead on his idea, but also stay involved and supportive to help make the fundraiser a success:

They also didn’t just say, "Oh, do whatever you want," and never checked on me. It was just really professional, back and forth, I had to check and tell them this is what I know…. it was just really fun, and they worked with us. (Teacher 5)

**High level of administrator involvement.** Many of the high school teachers mentioned that the administrators, both the superintendent and principal, often came into their rooms to help out and see what the students were working on:

They love coming into the classroom, and the principal and superintendent are both science guys, so they like coming up here. And I have [the superintendent] coming in with chemistry, and we’ve done several labs and lessons together, co-teaching, and hopping back and forth with instruction, which is absolutely great. (Teacher 8)

Sometimes the teachers would ask the administrators to participate or role-play some for a particular inquiry-based lesson or PBL. For example, in one eMINTS lesson in an advanced biology class, the teachers asked the superintendent and high school principal to role-play and have the students present to them:

I was a board member of an insurance company and the kids had to present to me why we should continue insuring the Southeast Asia Rice company, and we were there for three days, and the kids were making presentations in groups, just like people in business do. (District-level Administrator)

**Creating a positive school climate.** Another important role the administration has played is helping to foster a positive environment for the students. One way they do this is by having a lot of interaction with the students and really getting to know them as
individuals:

They stand in the hall and talk with them, and call them by name. And kids feel pretty casual around them, so they know people, and they know about families and things… that have to do with students and who they are, and why they are why they are, and some of those things. (Teacher 1)

**Generating school board, parent and community support.** One key role the administration played was to keep the board and community highly informed and supportive of the plan and then the project as it continued. School board support was essential from the beginning since they had to approve the district budget that would allow the Owenville staff to make the kind of changes that would remove many of the barriers they identified to full implementation of eMINTS: “There’s no way we could have gotten the community to buy into it, just totally gut the high school building. It was beautiful, we told them we wouldn’t touch it on the outside, and really now it’s a lot more inviting” (District-level Administrator).

Regarding the work of getting the school board on board, one of the administrators said the following:

My board had a lot of trouble with…. “How much is this going to cost” …and they want to see a return on investment, you know? And so that’s why we did a lot of the sharing of the results, what the kids [were doing]…. So we tried to really give them some data and, just the teachers every month, they would come to the board meeting and talk about whatever, you know, some piece of it. (District-level Administrator)

An administrator's comment on the situation really summed up the totality of support that made the Owenville eMINTS implementation so successful:

And then, just having the support of… the superintendent, and… the principal at the time, and the school board and the whole community buying into that philosophy made it a lot easier for teachers to take risks and to try new things” (Building-level Administrator)
The administration also focused some of their efforts on increasing the level of parental involvement and found the eMINTS implementation to be a motivator for some parents to reconnect with the school:

For parent teacher conferences we always had trouble getting high school, even middle school, some, I think parents either give up on their kids when they become difficult, or they pray that it gets better, and we had difficulty getting parents there; so we did a lot of those projects… as a show and tell for kids, and that got the parents there, and got the kids there, and it gave them a better understanding of what was going on in the classroom. (District-level Administrator)

**Knowledgeable about inquiry-based learning.** Many interviewees noted that the Owenville administrators were particularly knowledgeable about eMINTS classrooms and good teaching practices, in general. In fact, both the current elementary and secondary principals at Owenville completed eMINTS training when they were classroom teachers. That process helped them to know what to look for to better provide constructive feedback to teachers:

I had particularly strong curriculum instructional leaders, and [the high school principal], you could tell he was an excellent teacher; he had a really good understanding of what went on in the classroom. (District-level Administrator)

Another teacher's comments supported the same idea:

I think they interact very well with the staff as far as our administrators have all been teachers, so they know the struggle. Some of them even taught as we were going through some of this stuff, so, they understand what we’re trying to do. They collaborate still on lessons, which I’m not sure, I think that’s somewhat unique for principals to actually talk about making a lesson, eMINTS, and things like that. (Teacher 6)

In addition, although the original superintendent has since retired, the former secondary school principal is now the superintendent and a former Owenville High School teacher is now the secondary principal. That transition has helped keep continuity
in the message about the importance of eMINTS at the administrative level: “Just us being able to transition administrative people as we rolled over, into keeping that support, I think it’s gone a long way” (Building-level Administrator).

Even the administrators who were not directly involved in the training as eMINTS teachers found other ways to educate themselves about how the eMINTS classrooms would look. Besides spending extensive time observing the medical school problem-based learning (PBL) process, one administrator mentioned that he also spent quite a bit of time in the teachers’ classrooms, and talked quite a bit with one of the teachers who was creating a lot of PBLs and other eMINTS-type lessons:

I sat down and talked with him, he said “Well, it takes a long time to put it together, but once it’s done, they seem to get into it.” And he has continued to put more together. His classroom is also the most, most uh, different I guess I should say, and so I’ve kind of learned a lot from him. (District-level Administrator)

**Providing support and encouragement.** Nearly every teacher in the study mentioned how supportive and encouraging the administrators were to the teachers in general and about their attempts to integrated inquiry-based learning into their classrooms. Many stated that the administrators, both building-level and district-level, often came into their classroom and frequently made positive comments about their technology and inquiry-based learning integration efforts. Even a teacher who rated himself as low on his level of implementation of eMINTS in his classroom stated that the administration was still very encouraging about what attempts he had made, such as using various resources on the Internet and using the SMART Board. He also noted that when they did make suggestions
about trying other aspects of the instructional strategies they were very respectful in the way they made their suggestions. He explained as follows:

I love the leadership here because, [the superintendent] included, and the current leadership, they are very, very sensitive and professional. All those things I learned at [college], about how—don’t coerce people, be this kind of a leader. I would say overall they are really like that. They treat you like an equal person. (Teacher 5)

The results of the Learning Transfer System Inventory (LTSI) survey also supported this finding that the administrators were highly encouraging about teachers implementing what they learned. Teachers rated the “Supervisor Sanctions” construct, which is defined as “the extent to which individuals perceive negative responses from supervisors-managers when applying skills learned in training” (Holton, Bates, Ruona, 2000, p. 345) as the lowest of all the 16 constructs evaluated on the survey. This rating was extremely low on both the district-wide results and the high-school-only results, with averages at or near 1.0 (strongly disagree) for each group.

**Creating a safe environment for risk taking.** Another highly consistent finding was that the administration at Owenville has fostered an environment that is safe for teachers to take risks in classroom instruction, to try new things without fear of reproach: “We were not marked down on evaluations because we tried and it maybe was not as successful as we wanted the first time” (Teacher 10). Another teacher put it this way: “[The administration’s] just being willing to let us fail at times was kind of reassuring in a strange way” (Teacher 6).

Many teachers interviewed noted how important it was for them to have administrators who understood what good classroom teaching looked like in an eMINTS classroom: “Having educated administrators about what this product is and looks like is
probably important, because the teacher’s role is way different than what some principals or administrators are looking for” (Teacher 6). This high level of understanding of what an effective eMINTS classroom might look like was a significant factor in the willingness of teachers to move out of their comfort zones:

They knew and understood that if they go in to see a classroom that kids are going to be up moving around and doing things, it looks noisy or messy or whatever. And they’ve been interested and excited to see what those things are, so we haven’t had teachers who’ve had to worry about, you know, that their evaluation would be bad or something because it looks noisy in the room, or whatever. (Teacher 1)

In reflecting on the strategies the district had used to support its teachers in this new undertaking, one administrator commented, that there are “ways to help people grow without being offensive, and being respectful of who they are and where they are, because we’re all growing, you know (District-level Administrator).

**Providing resources.** Although resources at Owenville High School were by no means unlimited, one thing that the teachers consistently mentioned was how good both the building-level and district-level administrators were about allocating resources for the initiatives they supported, especially eMINTS. The superintendent explained what she would tell other administrators about finding the necessary resources to implement the eMINTS Program at their district:

Are there ways that you can incorporate your professional development days… if you already had them in the calendar, are there ways, rather than doing one-stop-shop PD? Are there ways that you can organize this and make use of, so that you’re using your current resources more wisely? I think a lot of times you just need to reallocate resources. Make sure you have the structure, so it’s not depending on just the administrator; you’re too busy doing the rest of the work. And hiring our people, we were able to change jobs around and things, so that it wasn’t actually new hires, I think we had one total new hire, but just releasing. We used iTV to take over some of the classes that we gave up by people. You know, there’s
(sic) ways, just look at ways of reallocating those resources. (District-level Administrator)

Resources might include equipment, professional development opportunities, time allotted, or money (such as for stipends for out-of-contract time). Teachers and other administrators noted the administration was very willing to provide the resources teachers identified as necessary for success: “If we needed extra things here and there to go along with the stuff that we’d gotten from eMINTS,… they didn’t hesitate to go ahead and fill those requests” (Building-level Administrator). During the collaborative planning sessions with the teachers, the superintendent was constantly assessing the resources needed to actually implement reform efforts:

As people are talking, in the back of my head, part of me is calculating room space, what we need, another part’s calculating the money, another part is calculating HR, you know, how many people, what do we need, what positions, supplies, and how to, you know. I know that we get this many computers, I know that in three years we’re going to have to have X number of dollars to keep upgrades…. And, you have to have all that thought out and planned out, or it falls apart, and we didn’t want that to happen. (District-level Administrator)

One of the key resources that the administration ensured was available was the necessary personnel to support the teachers in their efforts:

We had to have a technology person that was able to keep everything up and going, to have another [to do] database management that was able to help us collect all the pieces of data for all of our lesson planning, everything through the school matrix–she was critical. And then [our district eIS], being there for our on-site training, so that we didn’t have to worry about scheduling around families and other duties. (District-level Administrator)

Similarly, the new-teacher hiring process was also aligned with the goals of the program. When new teachers were brought into the district, the administration looked for
educators who would be a good fit for the environment that they had created, especially people who were open to trying new things:

When we hire people, we look for people who are interested in doing [new things], too, who don’t want to just stay and read the same notes year after year, that are willing to be adventurous and learn new things and keep changing. That’s probably the most important part as far as doing something different. (Teacher 1)

Respecting teachers’ time. The time it takes to attend training and develop new lessons can be a significant barrier to transfer for teachers. In addition to providing resources for the classrooms, the administration also ensured that teachers’ out-of-contract time was not taken for granted, finding ways to compensate teachers for that extra time. The administration was sensitive to what they were asking the teachers to take on:

Anything extra that they did, for the planning, the training, we always paid them…. Because I think we should honor their time, too, as professionals…. And so we tried to make it so that it was something that was accessible, that… we were not taking advantage of them as employees. (District-level Administrator)

Professional development opportunities. Not only did the administrators send teachers through eMINTS Professional Development with the federal grant funds, but they continued to allocate professional development money to eMINTS training each year to continue training new teachers: "The administration set aside a lot of the time, the money, and the subs over the years for us to be able to do the PD” (Building-level Administrator). In addition, the administrators offered to have teachers involved in other professional development opportunities consistent with the eMINTS instructional strategies, such as sending the high school science teachers through the highly hands-on, project-based Physics First program.
**Opportunities for site visits.** Many teachers mentioned that the opportunities to go on the site visits to see innovative teaching practices were highly motivating for them. Those visits were also essential in allowing the teachers to gain a clear understanding of what integrating inquiry-based learning into their classrooms would look like, which ultimately improved their ability to actually implement those instructional strategies:

I think the thing that helped me more than anything was the chance we had to go to the university and see their medical program. Because they use what they call PBLs, which is problem-based learning, which is pretty much the exact same thing as inquiry-based stuff….We all came back excited about it and we could see what the end product should look like, which is really nice when you’re trying to build something to know what it should look like when you’re finished. Before that as a teacher you always hear about new theories and whatever, but usually you don’t pay a lot of attention because you don’t see the benefit, but in this case we saw the benefit and that was sort of a motivation. (Teacher 6)

**Infrastructure changes.** In their original planning meetings, the teachers identified challenges to collaborating on lessons since they were scattered throughout the building. They believed that they would be better able to work together if the building were set up so similar subject areas were located close to one another: “We gutted the whole inside of the building and redid it, so that we had a math and science wing, so that we had social studies and language and communication arts—yeah, no, we moved the high school principal downstairs so we could redo” (District-level Administrator).

**Openness to new ideas.** Interviewees also consistently felt that the administrators were highly open to new ideas, as long the benefit of the students was at the heart of the reform: “I would say there’s (sic) opportunities here to do just about [anything], you know, if it’s good for kids, it’s good for education, if it’s good for the community, you
know, we will help” (District-level Administrator). Another individual explained it this way:

[The administration is] open minded about the fact that schools, for the most part, look like they did a hundred years ago, and that that probably is not necessarily a good thing.... They’re not interested in just staying with the status quo, or saying that’s okay, it’s fine... don’t rock the boat—they’re interested in boat-rocking if it seems like a reasonable thing, you know, if there’s a good reason for it. (Teacher 1)

And the administrators’ openness to risk taking and new ideas seemed to perpetuate a similar attitude among the Owenville teaching staff. While some staff indicated some hesitation or discomfort with the changing role of the teacher in an eMINTS classroom, many of the teachers discussed that they were able to take the necessary risks to become comfortable in that role:

I’m learning to loosen up a little bit, and give over some of that control of the learning back to the kids is a challenge, or was a challenge. It’s not as much now as it was then. And realizing that I was going to fail and flounder a little bit, and I didn’t provide enough scaffolding, or it was too, too much too quickly. So those were some things that you had to step back and go, okay, alright, what are we going to try next time? But, no, I wasn’t willing to give up quickly. (Teacher 10)

Another teacher explained how an administrator played a key role in helping her overcome some of her concerns with trying to implement IBL in her classroom:

I think at the very beginning when I started doing my problem-based learning, and it became more student-centered, and I felt like, oh my gosh, what are these parents going to think? You know, I was worried that the kids would come home and say [my teacher] didn’t tell me the answer, and that kind of stressed me out.... I remember my principal said “you just need to do it, and after you do it one time, you’ll feel better with it” and, you know, and he was right. I just took the plunge and it was okay. (Teacher 9)
In addition, as new teachers were hired, the administration specifically looked more at candidates’ openness to trying new ideas, than any specific past experience with eMINTS.

**Finding new ways to keep teachers motivated.** The administration at Owenville School District has continued to look for ways to keep the eMINTS strategies implemented in classrooms. The administration recognizes that, as time goes by, some teachers may fall into old habits or get stuck in a rut, using the few strategies with which they are most comfortable and not branching out. As previously mentioned, the district eIS continues to host monthly collaboration meetings that all teachers are welcome to attend after school.

In addition, another way the administration has tried to keep teachers motivated is to recognize teachers for their creative, high-quality lesson plans by choosing a lesson plan of the week to highlight. The high school principal implemented this program last year in an effort to keep encouraging teachers to continue to share and come up with innovative new lessons: “We usually submit the ones we used for eMINTS-based projects” (Teacher 2). Several teachers interviewed mentioned that having this opportunity and having a lesson selected was a real motivation to create new lessons and share them:

Last year we had a lesson plan of the week, where we all submitted what we thought was a strong lesson, and... those were available for us to share, so that we could collaborate and get ideas from one another, and there was one teacher that was chosen a week that was deemed to have a really successful lesson. That was kind of a kick in the pants, and supportive... you know, encouragement to share. (Teacher 3)
Looking toward the future. Administrators have continued to explore what the next steps for the district teachers and students may be. They plan to start another eMINTS Professional Development cohort in the fall to bring on several new teachers to ensure everyone is on the same page. In addition, they have also continued to have conversations with other innovative districts to explore what other ideas they might bring back to discuss with the staff. For example, they recently attended an eMINTS Conference where a presenter discussed a district’s latest efforts at integrating iPods into classroom instruction. The Owenville administrators have started a discussion about whether iPods or iPads might be something that they should consider for the future.

Technology Factors. Since an implementation of the eMINTS Program involves the introduction of large amounts of technology in the classroom and school, it is not surprising that teachers identified a variety of technology factors as both barriers and drivers to transfer. One of the most frequent challenges noted was frustration with the loss of instructional time due to technology-related issues. Technology was also cited as a key driver to teachers’ transfer of eMINTS instructional strategies, allowing the student-centered, inquiry-based type of teaching to occur much more easily, motivating students, and ultimately creating students who are better prepared for their lives after graduation.

Technology challenges. Several teachers noted that while having the plethora of technology resources at the school may be beneficial in many ways, it also posed a variety of challenges which ultimately worked against teacher motivation to use the eMINTS Instructional Model in their classrooms. One teacher noted that early in the eMINTS implementation, in particular, these issues were more prevalent and some teachers felt that it might not be worth using the computers:
[One thing that] frustrates teachers the most at the beginning are things like, students don’t know how to save, or don’t save in the right place, or little technical glitch sort of things, and you just think, "Ahh, it was a lot quicker when I just pulled out the worksheet and handed it to them than to try to get them to do it on this file and save it on there." And that gets better, definitely. (Teacher 1)

Depending on the teacher’s overall motivation, readiness, and comfort level using the technology in the classrooms, these technical issues may pose more or less of a barrier to the integration of eMINTS. The teachers who rated their level of eMINTS integration as lower, in particular, expressed greater frustration about the occurrence of technology problems and talked more about the amount of interference the technology created with the limited instructional time. “With all of the technical problems, with ‘oh, my login’s not working’, and—it was like a disaster” (Teacher 5). Besides student login issues, other computer-related examples cited as taking away from instructional time included difficulty when technology was not working properly or was running slowly, especially with older computers. When technology problems occurred and the technology resources were an integral part of the lesson planned that day, it would often result in significant problems and frustration. “If you constantly have computers that are going down or [are] broken, or the Internet is not working…it’s impossible” (Teacher 7).

Furthermore, despite the fact that Owenville High School has more technology than most, classrooms still have to share some technology resources which can cause interruptions to instruction. “I have the printer…and sometimes it doesn’t go off at all. But sometimes, like today, it was nonstop” (Teacher 4). Students also are often sent to other classrooms to borrow laptops if a teacher does not have enough for the number of students in particular class:
Not every classroom has those computers, so if another teacher wants to use them, if it’s a class that has a small amount, and I have 20 laptops, then they can come in and borrow mine. That’s fine, but it interrupts my class. It’s a squeaky loud door, and you know as well as I do, kids are in a classroom working quietly, the door opens—they all look….So they come in, they open the door, they bang around, they get the computer, they walk back out. The end of the class period, they come back in, they bang around, and they leave. (Teacher 4)

Moreover, for the teachers without as much technology in their classrooms, that situation can compound the barriers for them, as well:

It gets to be a big pain in the neck to send your stuff downstairs, and then go get it, and then "oh, where’s so and so." Sounds kind of, I don’t know if that sounds petty, but you put all of that together and it’s kind of a headache. (Teacher 5)

Another teacher noted that borrowing computers was only a problem if “I’m not on top of my game and planning ahead” to make sure she had figured out where she would get the additional computers needed; “then that can be an issue” (Teacher 3).

Even some teachers who had plenty of computers in their classrooms and used them often still mentioned some technology-related challenges. One teacher mentioned a recent issue of plagiarism in one particular class with which she was currently dealing; another teacher discussed the difficulty in making sure students used reliable sources when conducting research on the Internet. And yet another teacher mentioned his frustration that many students lack adequate search skills to find relevant information in an efficient manner, so he has to spend time preselecting resources for them:

I always have websites ahead of time that they’re supposed to use, because they would waste half their time if they just do a Google search and they have 20,000 hits, and they would spend forever not knowing what to look at and what to look for….Some of them could look it up and they’d be fine, but other ones… they just sit there and stare for 20 minutes at the same page well, "Can I use this or not, is there anything on here?" (Teacher 7)
Technology as a positive force. While many of the teachers noted experiencing some technology challenges at one point or another, the vast majority saw the technology as a positive addition to the school. Many noted that it improved instruction by linking classrooms to a vast amount of resources, especially those available on the Internet; it was a tremendous motivator for students and teachers; and it helped the school make significant progress toward its goal of creating students with critical 21st Century skills.

One teacher noted that he found that technology was able help students better visualize the concepts, such as abstract mathematical concepts that are challenging for students to comprehend:

I think eMINTS and technology can help remove a lot of frustration from understanding, because [students are] so visual….Our culture would be a lot better off if kids could visualize while they solve. (Teacher 5)

Other teachers explained that having the computers located in their classrooms made the ability and decision to use them for instruction much easier. The survey results of the LTSI support this finding. The teachers at the high school and in the whole district indicated that they agreed that they did indeed have the opportunity to use what they had learned in professional development. The average scores on the transfer dimension “Opportunity to Use,” defined as “the extent to which trainees are provided with or obtain resources and tasks on the jobs enabling them to use training on the job” (Holton, Bates, Ruona, 2000, p. 345), were at 4.00 or above for both groups. As one teacher explained the situation:

I have always done some types of inquiry learning….but it was always more difficult, because you just had one computer lab. And so I guess the biggest thing for me was just, once we got all the computers, then it was much easier to do; it was much easier to do it often. (Teacher 7)
Many interviewees also commented on how helpful and reliable the wireless network in the school was and how that led to very little down time with the Internet, which also made the use of the technology in the classroom easier:

The wireless here for whatever reason is tremendous, and everybody that comes here to visit or whatever comments on how well the wireless works. Having that, not having to fool with cords, allows our students to have a lot more freedom. (Administrator 3)

One teacher explained the particular care that was taken in placing the wireless access points to try to achieve the best results possible:

We have 10 or 11 wireless access points, so we didn’t skimp on those. We have them, and that’s one of the things that we put in last year over in the K-1-2 hallway, because they could not get wireless access over there. So we put a wireless access point, and our maintenance director is really helpful. Before we installed it, we set it in a room, and then I took…the laptops they would be using and I went around to each of the rooms looking for dead spots, you know, places where we weren’t going to get a connection….So we tried to place it where we were going to get [the best connection], and we have an old building, so we have old walls, we have thick walls. (Teacher 10)

Furthermore, nearly every teacher noted how extraordinary the district’s technical support team was and how important that support was for the successful use of the technology in their classrooms:

It’s awesome. They’re incredible. Our tech support is immediate. She’ll say "oh, I don’t have time to do this," and then it’s done like five minutes later. You get an email and it’s done…. She’s really good, very efficient. (Teacher 9)

One way the district administration helped ensure that teachers and students would have easy access to technical support was to follow a member of the technical staff’s suggestion that they put the district eIS/curriculum director, the database
administrator, and the technical coordinator all in one room in the front hallway of the high school. She explained her reasoning as follows:

[I suggested that they] move us to the room that we are now, because we’ll be closer to the office, and put all three of us in the same room so that we can collaborate, and when students or staff come in with a question we can address it—somebody in here is going to be able to answer this question. If not, we will find the answer. And so that’s been very, very helpful, having us all together. (Teacher 10)

Improved technology skills. Several interviewees noted that overall both the staff and the students had significantly increased their technology skills since the district began implementing the eMINTS Program: “I think as a staff, and as a student body, we’re much more technology literate” (Teacher 2). Teachers who had gone through the eMINTS PD felt especially comfortable using technology; however, another teacher who had not gone through the training but did use the technology with students mentioned that he sometimes felt frustrated that he did not have more technology skills: “The kids are, I would say at times ahead of me, so that makes it frustrating for me” (Teacher 13).

However, many teachers felt that it was extremely beneficial to the students to have this high level of technology access and use:

It kind of feels like it, if you’re not bringing it to your school that, it just feels like in this day and age and,…kids are so technology based, and they need to be challenged….The old ways of doing things are not, I don’t feel work as well as they used to with kids. (Teacher 12)

Another teacher noted that having the students use a variety of computer platforms at school provided additional benefits to the students:

We have mostly Macs for students, but also some PCs, and most of them have PCs at home, and they know how to switch back and forth and not be bothered by that. I think probably that will help them out a lot in the future where they don’t really realize that that will be a benefit…that they’re adaptable. (Teacher 1)
High School and Curriculum Factors. Many of the interviews provided some insight about the unique issues related to implementing eMINTS at the high school level. In some ways, the highly structured nature of the high school schedule can be a major barrier to implementing eMINTS, especially certain aspects of the eMINTS Instructional Model; for example, eMINTS promotes interdisciplinary teaching wherein a single lesson or project would address standards and concepts from multiple content areas at the same time. Getting teachers who were responsible for single subjects to work together and create lessons that included other subjects was a significant challenge. However, the administration was committed to finding ways to make those types of lessons work and finding ways to get teachers to work more collaboratively for the overall benefit of the students:

High school was really hard because they didn’t have that time built in during the day. There wasn’t as much, and they would just teach one subject, and they didn’t always see a student that was poor in science may be wonderful in writing, but science may not lend itself to that....So sometimes kids were treated with assumptions, you know, and not see the whole, the whole child. So...we did a lot of team building activities, not only among the staff, but also among the kids, especially the high school kids, so that we could do our larger group experiences, like the Renaissance....When we first tried some of these cross-curricular [lessons], we did it as bigger projects, just a one-time shot, and then we tried to incorporate...the project-based learning...into the eMINTS [classrooms]....So breaking down the content specialists’ thoughts to where we were all student specialists, or child specialists. (District-level Administrator)

Another structural limitation mentioned by some teachers was the short class period in a typical high school schedule makes implementing eMINTS strategies more difficult than at the elementary level; these limitations often diminished teachers’
motivation to try certain aspects of the eMINTS Instructional Model, such as community-building activities:

I think it is tougher at the high school level because everyone shifts around all day. Every 50 minutes you have [class changes], and teachers are reluctant to take a lot of time to work on that, because time is so limited…. You can’t have a class meeting for 15 minutes, you know, even once a week, because that’s a big chunk of your time…. I think they have learned that doing those along the way is a good thing, and they’re more conscious of trying to do it, but I do think it’s harder than when you’re in the same room all day with the same set of people. (Teacher 1)

Another teacher agreed that the frequent class changes were a barrier and he talked about how the previous high school where he taught had implemented block scheduling, which allowed for longer class periods and fewer transitions. We “went four classes every day, here we go seven. I think eMINTS would work better in a block schedule” (Teacher 5).

There were other interviewees who felt that implementing eMINTS instructional strategies with older students was actually easier than with younger students. One person explained that older students have more knowledge and experience on which to draw for projects:

Seeing it used at the university, seeing it used at the high school and middle school and elementary, was more of an eye-opener for me…. It pointed out that inquiry-based requires you to have some base knowledge to begin with. If you give somebody a problem and they have no concept of the problem, where to look for things…. So, really, I saw that it works best… in high school and college level. Middle school you can begin, and elementary I don’t think it is as beneficial, because they don’t have that base knowledge. (District-level Administrator)

One interviewee explained that getting students to work in groups is especially challenging at the high school level; whereas younger students may comply more to please the teacher or go along with the group, “at high school [there is] a lot more
independent thinking and every hour you need to win them over again to, that it’s worth doing what I’m asking you to do” (Building-level Administrator). He explained that sometimes students’ uncooperativeness is discouraging to the teacher trying to incorporate eMINTS instructional strategies:

There’s more apathy [at the high school level], and so it’s more challenging to make good collaborative groups that all function. I think you’re more likely in a classroom to have… some of the groups working well and some of them just don’t work very well. And that’s frustrating for a teacher. And sometimes teachers will still talk in training, “Well I did this, but this person didn’t get anything out of it. And so I’ll say well, if you’d done it a different way, if you’d done the traditional way with lecture notes and something else, would they have gotten anything out of it then? Well, no, they weren’t doing anything then, either. So…it’s hard to let some people drop off the edge, but, still some do. (Teacher 1)

**Subject-specific issues:** Some participants of the study also noted that they believed that the different high school subjects varied in their degree of natural applicability of eMINTS instructional strategies. For example, one teacher noted that business class was an especially good fit with eMINTS: “Business is so real world, so it’s not hard to do. It’s very easy” (Teacher 9). Several teachers also mentioned that in science it was especially easy to incorporate the eMINTS instructional strategies, since “science itself is just inquiry-based” (Teacher 8). Other subjects seemed more challenging; in particular, several teachers suggested that the more skill-based the content of a course, the more challenging it is to teach it in an inquiry-based way:

Some classes just are more difficult to put with eMINTS, and I think math is one of those… simply because math is pretty definite. You have a specific answer you’re trying to look for. Where in science, and history particularly, and of course language arts you can just do about anything, your interpretation of a story may be something different than mine, and there’s no one right answer, so I think that’s different classes. (District-level Administrator)
**High-stakes testing pressures.** Several teachers explained that although they would like to do more project-based lessons with their students, they often worried about the end of course (EOC) exams that the state requires students to take for many of the high school courses or making sure students were properly prepared for upcoming college entrance exams. Teachers worried that they may not have time to cover the entire curriculum that students will be tested on if they spend too many days using more student-centered teaching methods:

> Time is really the hardest because they need to know how to do so many different things…and trying to just make sure they know how to do this and that…trying to come up with a big project at the end of it or at the beginning of it, it’s just really hard to want to stop for a week, or even a few days, when we just have to keep going for EOCs at the end… I just feel like sometimes,…we have to keep going, we can’t do something…more, maybe exciting with it. (Teacher 11)

Some administrators do help teachers manage the stress of high-stakes testing, while also supporting them in integrating technology and inquiry into their classrooms. For example, for one teacher who had End of Course (EOC) exams required in majority of his courses, he explained that this pressure was a primary barrier for him to use the technology and inquiry-based teaching strategies. However, he explained that his administrators understood these pressures and were flexible about their expectations:

> I get asked, “Hey why don’t you try a PBL in one of your classes that doesn’t get the end of course exam.” And that’s fine, that makes sense, but if they ask me to do that in the ones that I’m going to be tested in, I start to [get concerned]…I’ve told our principal this, I’ve got to prepare them for this test. (Teacher 5)

While elementary students do not do take EOC exams in particular, they are required to take other high stakes tests. Therefore, these concerns about testing are not a barrier that is unique to implementing eMINTS at the high school level.
More challenging to create cross-curricular lessons. At high school, teachers are subject matter experts, and likely do not know the details of what or when during the semester other teachers are introducing certain concepts that might connect. Therefore, at the secondary level (middle and high school), the success of creating complex, cross-curricular is highly dependent on the amount of communication and collaboration that occurs among the high school staff. One administrator explained that they were able to help find time for regular time for this type of collaborative lesson planning for the middle school teachers fairly easily; however, finding a solution for the worked for the high school teachers was more complicated:

With the middle school we had changed so that they had common planning. At the high school, we did that as much as we could, and...we would have [the nearby university’s education] students come for teacher release days. So we would schedule those around, so it would be an internship for a third or fourth year education student at the college of education, but we had the same subs coming in, the same person, same intern, so it wasn’t disruptive to the class, and they would come like every two weeks or something. So, we would schedule those as work days, and we would have them scheduled so that we could release certain teachers together to discuss, and that was elementary, too, and middle school and high school. (District-level Administrator)

Advantages of implementing eMINTS with high school student. However, not only were some challenges unique to the high school implementation, some of the enhancers were unique to them as well. Since the older students had already gained many knowledge and skills from their previous years of schools (and from more life experience in general), the students were able to engage in inquiry-based learning tasks that were at a much at much higher levels than younger students, who many still have been learning the basics of typing on a computer or how to be an active member of a group. The types of
PBLs that the high school teachers created often involved highly complex tasks and a level of personal- and group- management that would not be possible for younger students.

**More motivated students.** Another highly consistent finding in the study was that students in the eMINTS classroom were indeed more motivated, as the teachers who originally advocated for the program had hoped. The technology itself captured students’ attention, as one teacher explained: “The kids love the technology and that instantly motivates them” (Teacher 6).

In addition, students seemed more engaged in the classroom when teachers incorporated more problem-based and project-based learning strategies. One particular teacher explained the feedback he received from students: “I did interviews of kids and what they liked best… it was overwhelmingly, ‘we like the projects and… stuff better than worksheets and lectures’” (Teacher 7).

Seeing the students before the eMINTS implementation and then afterward, one administrator noted how remarkable the change was from her perspective:

I didn’t see bored kids. That was the hardest thing as the superintendent. I came from elementary, kids aren’t bored, and to walk through and see kids just leaning back, passing time, or asleep, or trying to do something to get out of it…and I haven’t seen kids not engaged – I didn’t the last three or four years I was there. I mean, it was a striking difference. (District-level Administrator)

**Highly collaborative work culture.** Finally, the most consistent finding of the study was that the eMINTS Program implementation at Owenville had facilitated the development of a highly collaborative and collegial work culture at the high school. Nearly every interviewee mentioned how well the staff, teachers, and administrators,
worked together and how often they consulted one another about their lesson ideas, and how much this support helped them to be successful in using the eMINTS instructional strategies in their classrooms. This high level of peer support was also confirmed in the LTSI survey results with participants; the “Peer Support” construct, defined as “the extent to which peers reinforce and support use of learning on the job” (Holton, Bates, & Ruona, 2000, p. 344), was one of the highest rated categories for both the high school only and the whole district samples, with average ratings of 4.29 and 4.14, respectively. Not only did they collaborate during the eMINTS PD sessions, but they began to collaborate at other times:

They even started…to each other’s classroom and do peer coaching….I know I went in one day and the guys were, instead of the basketball games, reviewing the tapes. They were reviewing their teaching tapes. They were taping each other. And then they would come into my office, “You used to teach 6th grade, but middle school, what can I do with social studies? I’m thinking this, this, and this, does that make sense?” (District-level Administrator)

This new collaborative spirit had a positive impact on the teachers, but also on the students:

When you heard the teachers talking about, “Oh, I’m trying to do this, I’m trying to do that, what do you think”…. they really got involved in it and were sharing back and forth and bouncing ideas off each other, and any time you can get a group of teachers doing that…they become excited, and then that’s going to always bleed over into the classroom, [the students] get excited, too. (District-level Administrator)

As previously mentioned, one of the eMINTS teachers who participated in the very first group of eMINTS PD at the district has since been given an extra hour a day specifically reserved for helping other teachers in the district develop innovative, eMINTS-type of lessons. He explained his role this way:
I’ve done it for a long time, so, they just give me a topic and I can sort of give them suggestions depending on their age level and different things that they’re teaching, of a way to use technology in a creative or…productive way, and make it more of an eMINTS lesson. (Teacher 6)

Teachers seemed extremely knowledgeable about each others’ lessons and expressed a high level of respect for each others’ unique abilities. Several mentioned that certain teachers were particularly skilled with a certain software program or a particular type of teaching strategy, and so they would go to them when they needed help with that.

In addition, many teachers suggested that this level of collaboration, collegiality, and mutual respect created an extremely satisfying work environment. Most teachers at some point in their interview indicated a high degree of job satisfaction. Several also noted that the small school environment made this level of support and collegiality especially possible. In fact, a couple of teachers mentioned that they had been encouraged by family and friends to pursue a job at a bigger school, where they might be able to make more money. They indicated that the work environment, with highly supportive administrators and peers, outweighed any other factors and that they truly enjoyed working in the small, close-knit environment at Owenville. “A lot of people have asked me, my friends, why don’t you go to a bigger school,… and I’m like well, I’ll tell you why, because one reason is I like my job. I’m not stressed” (Teacher 5). Another teacher explained her feelings this way:

I don’t want to go to a bigger school, because of the environment we have here…and all the support I have. You know, it’s great, actually, living and teaching with a small school. (Teachers 8)

Interestingly, the strong collegial culture is a reason that people stay on at the school and the fact that so many people stay on board continues to strengthen the culture.
Some interviewees noted that in the beginning of the eMINTS implementation, some teachers who were not as interested in implementing the program chose to find other jobs. But for the past several years, the district and the high school, in particular, has had extremely low turnover, with “retirement [being] about the only way we’ve lost teachers” (District-level Administrator). Another teacher explained the bond among the teachers this way:

I think there is a level of excitement and a level of…professionalism among the teachers that we are all in this together. We almost feel like a hand-picked group of people now that have come through all of this stuff. ‘Cause to be honest, the people that didn’t want to do this are gone now, really for the most part. And the people here, [those people that] are being hired and they know coming in that this is the way we do things. And really it feels kind of like an elite group that’s trying to do this eMINTS stuff and impact our kids. I think it’s a much better atmosphere and attitude for both the kids and the whole school, in general. (Teacher 6)

Part of the strength of the culture seems to stem from many of the staff having shared experiences, especially regarding eMINTS. For the new teachers (those new to the district and new to teaching, in general), the collegial atmosphere seemed to be especially important, probably the most important factor. Most of the newer teachers in the district had never taught in an eMINTS classroom or participated in eMINTS PD prior to coming to Owenville. Many teachers noted that these new teachers received a great deal of support and were allowed to move toward inquiry-based teaching in a gradual way:

We have a structure in place, these are the people who will help you get your feet under you, if you’re a beginning teacher we will help you, with the mentoring and everything, get you settled in that, and then we will start introducing elements. But, that it was a graduated scale of our expectations, based on what the people…where they were in their careers themselves, and in their own professional development. (District-level Administrator)
A couple of teachers that were in their second year at the district and almost finished with their eMINTS PD explained that being a part of the training was extremely helpful for them.

We started in the summer, like the beginning of August, and so I was doing [eMINTS PD], and that really gave me the opportunity to meet some of my colleagues, and get to know them a little bit better. So, I think that was a great kick-start to my first year. (Teacher 8)

It allowed them an opportunity to get to know their colleagues early on so that they were very comfortable asking them whatever questions came up. In addition, being part of this active eMINTS PD cohort also meant that they received regular classroom visits, coaching, and mentoring from the district eIS: “I love having her come up and observe and even be involved…. She likes to be involved also, not just sit there and watch. So that’s been great” (Teacher 8). The district eIS helped the new teachers in the group to understand the eMINTS philosophy and begin integrating it into their classrooms. She also dispelled some of their misconceptions. For example, one teacher explained that she initially thought that being an eMINTS teacher meant that she was supposed to be using the computers all the time:

Something that I struggled with at first, and [the district eIS] had to remind me, “No, they don’t want you to just get a computer out every day, they want you to really just make sure that it’s inquiry-based and if you can do it by hand, that’s fine.” (Teacher 11)

Overall, the eMINTS PD seemed to be a powerful method of enculturation in the district for new teachers. This finding was also validated by comments from and about teachers who were not initially included in the training, suggesting that not participating in the eMINTS PD and not getting the equipment in their rooms left some teachers feeling left out of the excitement and collaboration: “So I watched while my peers got
new technology and learned how to use it, and was sad that I was unable to join them in that endeavor” (Teacher 3).

Some teachers in their first year in the district have not yet been included in eMINTS Professional Development, since no new cohort began when they started with the district. While they also noted that the work environment was a positive one, some of their comments stand in contrast to those of the newer teachers who were involved in training when they first began with the district:

I think it’s hard coming into a school that is so integrated, that everyone knows everyone, to be an outsider, you know, in that school. But, not that anyone would makes me feel uncomfortable, because everyone has made me feel very comfortable, I just feel like I haven’t gotten to know everyone. (Teacher 12)

While the comments from interviewees suggest the administration was very cognizant of the time it takes for new teachers to begin using inquiry-based learning in their classrooms, the expectations from students also posed some challenges. One teacher recalled his reaction when he first came to the school after the eMINTS implementation was in full swing:

It was a bit of surprise to me how much kids knew about technology, and how used they were to using that in the classroom setting. So I did find it was hard; I felt like coming to my class was the old-fashioned, old school, “Oh man, when are we going to do a PBL?” (Teacher 5)

Another teacher who had not been through the training since his subject area was less conducive to using the eMINTS teaching methods, indicated that he had spent time talking with other teachers to try to find some ways of incorporating the technology and inquiry into his instruction, partly due to student pressure to teach this way:

It’s really trickled down even to me, because I haven’t had any training… but I have asked and they’ve helped me with PowerPoints and some
different ways of teaching. Like I said, you don’t want to be that teacher that still lectures out of the book and when they’re doing all this fun stuff in other classes. (Teacher 13)

Teachers who are new to the district and not involved in the eMINTS PD also seemed to be less aware of what other teachers were doing in their classrooms:

But as far as what they do in class, as far, I mean—in lunch I’ve heard them talking about what’s due for this week, or what are we going to do in class, and it sounds like they take their curriculum and they’re just adapting it to incorporate more technology, but beyond that, I don’t know. (Teacher 4)

Clearly, teachers consistently expressed their satisfaction with the work culture of Owenville High School, whether or not they were fully involved in the eMINTS implementation at the school. However, those teachers who had participated in eMINTS PD discussed the collaboration aspect of the work culture much more and expressed more feelings of collegiality than other teachers who had not been involved.

**Conclusion**

Overall, the findings of the study suggest that a large number of contextual factors were related to teachers’ level of transfer of learning of the eMINTS instructional strategies. Administrators at both the district and building level found myriad ways of enhancing the transfer process, such as providing high levels of support, clear vision, collaborative planning, procurement of resources, and attention to developing stakeholder buy-in. While the comments about administrative factors were overwhelmingly positive, most of the other transfer factors identified in the study were generally more mixed between ways in which they were helpful, but also ways that those factors acted as barriers. For example, technology was a significant driver for transfer in that it provided motivation to both teachers and students and greatly increased the ease to which teachers
could implement both the teaching and the technology aspects of eMINTS. However, technology had the potential to pose significant barriers to teacher transfer if problems consistently detracted from limited class time. Similarly, some high-school-specific factors inhibited the transfer process, such as the constant changing of classes and highly focused content of some courses; while the greater background knowledge and experience of older students enhanced teachers’ ability to use inquiry-based teaching in their classrooms. Finally, the participants of the study overwhelmingly indicated that the collaborative, learning-oriented work environment was a huge driver to their transfer of learning. In the following chapter, a discussion of these findings and their relationship to the relevant literature is discussed, along with conclusions about the overall study, as well as implications for future research and practice.
Chapter 5: Summary, Discussion, and Conclusions

Introduction

This chapter presents a summary and some of limitations of the case study presented. Subsequently, a discussion of the major findings and some of the key conclusions of the research are presented. The chapter concludes with the researcher’s suggestions for future research and a discussion of how some of this study’s findings could be applied to practice.

Summary

This research used a single case study design to address the following research question: What factors enhanced or hindered teachers’ transfer of learning in the eMINTS Program implementation at Owenville High School? The data collected during the research revealed a wide variety of contextual factors which were related to teachers’ ability to integrate the eMINTS instructional strategies and technology into their classroom practice. While some information was gathered about the district as a whole to provide context for the case, the primary focus of the study was on the high school specifically.

Participants in the study included Owenville administrators and teachers from all through the district. Elementary, middle, and high school teachers who had participated in eMINTS PD at Owenville School District were asked to complete an online questionnaire related to the district transfer of learning climate. In addition, these high school teachers, several additional teachers, the district-level and high-school level administrators, the technology coordinator, and the curriculum director/district eMINTS
Instructional Specialist (a total of 16 individuals) all participated in in-depth, semi-structured interviews and were asked to provide any supporting documents or artifacts for the study. Finally, each of the high school teachers responsible for core subjects (mathematics, communication arts, social studies, and science) was observed teaching during at least one class period.

The data from the survey, interviews, observations, documents and artifacts were all analyzed to develop a rich understanding of the eMINTS implementation. The data was also organized using NVivo 9 software to determine and triangulate the various themes that emerged.

The detailed findings of the study were presented both chronologically and thematically in Chapter 4. Overall, the findings suggest that a large number of contextual factors were related to teachers’ level of transfer of learning of the eMINTS instructional strategies. Administrators had a significant positive impact on teacher transfer, as they set clear expectations, provided extensive resources and support, and engaged the faculty in collaborative planning efforts for reform.

Technology also emerged as a significant contextual factor for transfer of learning. Technology acted as both a hindrance and a motivating force. Many teachers suggested that too many technical “glitches” could easily have caused them to give up on their efforts to integrate eMINTS instructional strategies; however, due to the excellent reliability of the Macintosh computers and wireless network in the building, as well as the superb efforts of the technical support staff, those technical barriers were avoided for the most part. Furthermore, since the research question particularly concerned the factors related to transfer in the high school context, the researcher took care to inquire about any
specific barriers or enhancers related to high school in general or particular to high school courses. In fact, the findings showed that a number of elements in the high school context did inhibit teacher transfer of the eMINTS strategies, such as short class periods with frequent student transitions and greater student disengagement than lower grades; however, the older students were more facile with the technology, so teachers did not have to use their time to instruct them on a lot of computer basics, and the high school students also came with more prior knowledge and experience, which made the inquiry-based learning process easier to implement.

Finally, the highly collegial and collaborative work culture that had developed at the district since (and largely as a result of) the eMINTS Program implementation, acted as a key driver of transfer for teachers. Almost unanimously interviewees expressed that Owenville School District was a good place to work, with staff that genuinely care about the well-being of students, and who were always willing to help one another out in their efforts to improve teaching and learning. This type of supportive learning-oriented culture was fostered by the administration, the district eIS, and several teacher leaders, and has become solidified through the shared experience of implementing the eMINTS Program.

**Limitations**

This study had several limitations, including the following:

This study was limited to only one site, the Owenville High School. Relevance to other sites is highly dependent on how well this case resonates with those other sites.

As previously noted, as often is typical in many qualitative studies, the researcher was the primary instrument of data collection. A concerted effort was made to maintain
objectivity in the data collection and analysis process; it is important to note, however, that I have a long history with both the eMINTS Program and the Owenville School District which may have impacted (both positively and negatively) my ability to see the situation clearly.

Discussion

Many of the findings in this study were highly consistent with much of the transfer literature, especially the literature related to technology integration efforts, the role of leadership, and the relationship of culture. The following sections highlight how some of this literature specifically applies to the current study.

The role of leadership. Much of the transfer literature outlined in chapter 2 discusses how leadership support can act as a positive driver for transfer of learning. For example, Marzano (2005) outlined seven key responsibilities or behaviors that principals should engage in to facilitate the success of a second-order, or transformative, school reform effort. The district-wide eMINTS implementation that occurred at Owenville School District, which significantly changed the way that instruction occurred in practically every classroom, would be considered a second-order change effort. Examining these seven responsibilities, it appears that the administrators skillfully engaged in all the behaviors listed.

The first two essential responsibilities of principals that Marzano (2005) mentions for successful second-order change are having administrators that are knowledgeable about curriculum, instruction, and assessment and having the administrator take on the role of “optimizer,” or "one that inspires and leads new and challenging innovations” (p. 43). Clearly, the findings of this study suggest that the Owenville administrators skillfully
fulfilled both these responsibilities. As one administrator noted, regarding her early efforts to find the right reform to improve the academics at the school by exploring various state and national reform efforts: “I always tried to read a lot, study a lot, and so…I tried to stay close to the forefront of what was going on” (District-level Administrator).

Throughout the study, interviewees remarked on how knowledgeable the administration at the school was, both about the eMINTS instructional strategies that were being implemented, as well as about good instruction in general. A number of teachers mentioned that they not only brainstormed about lesson ideas with their peers, but felt comfortable doing that with the principal and superintendent, as well. In addition, many teachers indicated that the fact that the superintendent had spearheaded the reform effort and all the administrators were such strong supporters was a critical factor in their own success at implementing eMINTS in their classrooms.

Other responsibilities Marzano (2005) mentions include having the school administrator take on the role of change agent and assessing progress along the way. Once again, interviewees consistently noted the Owenville administration's high level of openness to new things. They mentioned that not only were the administrators extremely comfortable with trying new things if they were in the best interest of the students, but they actively promoted an environment that was safe for teachers to take those risks, as well:

They’re also very forgiving with mistakes that you might make when you’re trying….They’re understanding that you’re not going to maybe get it perfect that first time you do it. I think that’s really important, too….I just feel totally comfortable taking a risk, and even having them in my room while I do it. Like I’m not intimidated at all, because I feel like, in
the end, they would say oh, well, you could do this, or you could do this—I just respect, you know, their opinion, and feel pretty comfortable with my relationship with them. (Teacher 9)

A number of teachers talked about the importance of reflecting on how the new things they were trying were working to make improvements for the next time:

Definitely try out everything once. At least once, in the room, to see if it will work. And then when it doesn’t, you know, really analyze it and see if maybe you can tweak it. And there’s (sic) some things that it wouldn’t work, and there are some things that’ll be great. (Teacher 8)

Moreover, one administrator also discussed the importance of gathering and using data to make decisions about the reform. She explained that presenting relevant data was especially important and effective at generating school board support, as it helped board members fully understand what benefits the changes were having for students.

Finally, Marzano suggests that the last important responsibility school leadership has for the success of a major school reform effort is that the leader “communicates and operates from strong ideas and beliefs about schooling” (p. 42). Consistently interviewees talked about the administrators' high level of commitment to the well-being of the students. One administrator explained her vision for the school in the following way:

It was [about] trying to create a culture and environment….We couldn’t do anything about their lives outside of school, but between 8 to 3, we could create an environment, and that was my theme song I preached…that this is a good place for children to be, a good place for people to work. It was a safe place. (District-level Administrator)

The study done on eMINTS principals’ leadership styles is another study that resonates well with the present study. As previously mentioned, the research by OSEDA (2003) indicated that a participatory style of leadership was the principal leadership style most likely to facilitate teachers’ use of eMINTS instructional strategies in their
classrooms. Interviewees in this study indicated that teachers were highly involved in a collaborative planning process as eMINTS was implemented at the school. As one person explained, this high level of involvement in decision making had a tangible impact on teacher buy-in: “Respecting people’s opinions and their experiences, and…then as a group deciding what we can do, and I think that really increased our level of commitment” (District-level Administrator). Another person interviewed explained the administration’s leadership style and commitment to teacher involvement this way:

They’re very willing to talk to us. They did not come and say, “You will do this.” The approach was “we’re interested in this, this is why we think this is important, would you be willing to—would you be interested?” And so they’re very willing to listen to staff and to incorporate staff ideas. We’re a very community-oriented staff here. (Teacher 10)

**Technology integration literature.** The present study shared some consistency with the findings of several studies on technology integration attempts with schools. For example, O’Dwyer et al. (2005) discuss the ways leadership practices and support can highly impact teachers’ adoption of technology in the classroom. Their findings are similar to the findings of this study. Furthermore, they found that technology-related professional development had a large positive impact on teachers’ use of technology. In the present study, many interviewees cited the participation in the eMINTS PD sessions as a key driver to their and other teachers’ transfer of learning. Additionally, teachers cited the one-on-one sessions and classroom visits from their eMINTS Instructional Specialist as extremely helpful to their efforts. These visits are a regular part of the eMINTS Professional Development program, designed to allow more personalized follow-up and mentoring than can be done in the group sessions. Regarding the impact of the in-classroom visits from the eIS, one teacher explained:
She would come in and do her observations and then give you feedback, which was also very helpful, because this was very new to us and so, when you’re not sure exactly where you’re going, or where you’re going to end up. (Teacher 10)

Another teacher also expressed the usefulness of these visits from her eIS:

Well, she can definitely see things I don’t. So that’s always something good to know, and… when we sit down and discuss, we always come up with new ideas, or new ways to approach, a situation that would happen in class, or a different way to apply the technology or to present the material. (Teacher 8)

Many teachers mentioned that they especially found the one-on-one with the eIS outside of the classroom helpful in improving their ability to make more eMINTS types of lessons for their students:

She is pretty amazing. She’s really good at taking the time to help me develop the lesson so that it has that higher order thinking and that I don’t miss any real-world concept that the kids might need. [Whenever] I write a lesson and she always looks at it….I mean, I don’t think I’ve written very many that she hasn’t looked at. (Teacher 9)

O’Dwyer et al. (2005) also suggest, besides a strong focus on providing teachers with related professional development, that greater technology integration will occur with greater availability of technology resources in the school. As discussed, the teachers at Owenville High School also indicated that the ready access to the technology in their classrooms removed barriers that they had previously experienced.

The findings in this case study are also consistent with many aspects of Cuban’s (2001) book on the introduction of technology in schools. Similar to several other authors, Cuban emphasizes the importance of considering the context in any technology-related school reform effort. He also suggests that administrators need to implement shared decision-making with school staff and operate with a genuine respect for teachers'
professionalism and expertise. As has been articulated already, this study found that these types of leadership practices did indeed occur at Owenville School District and at Owenville High School specifically; furthermore, the study participants indicated that these actions had a strong positive impact on teachers’ transfer of learning regarding eMINTS technology and instructional strategies.

Cuban discusses some of the particular challenges present in the way that most high schools are structured. Many of these same issues were cited in this study, such as the limitations of the rigid high school schedule. Cuban also outlines many of the problems that technology can pose when it is integrated into the classroom. This study found that teachers attempting to use the technology did indeed have some of the same anxiety over possible technology problems, “server crashes, software foul-ups, printer glitches, and slow Internet connections” (p. 173) that he outlines. However, in this particular setting, these potential problems were rarely realized due the high-quality technical support at the district; therefore, such technology problems were not often barriers for most of the teachers interviewed.

**Fostering a culture of learning.** Some of the literature on leadership’s impact on culture is also highly relevant to the present study. Schein (2004) suggests that in order for an organization to be able to meet the newest challenges it faces, it must be flexible and able to continually engage in problem-solving; he calls this type of organization a “learning culture” and argues that it is the key responsibility of the organization’s leaders to create this learning culture. In the case of Owenville, prior to the adoption of the eMINTS Program at the district, teachers and administrators felt that the traditional
school setting that existed there was no longer sufficient to meet the needs of the
students, to prepare them for jobs and life in the 21st century.

Schein (2004) defines ten dimensions of a learning culture, most of which applied
to the Owenville school environment. For example, teachers reported feeling that the
faculty enjoyed a high level of open communication and sharing. The administration
fostered an ongoing commitment to learning within the staff, as well as holding a high
value on “reflection and experimentation...[giving] its members time and resources to do
it” (p. 396). In addition, the ongoing collaborative meetings with staff that the
superintendent held even before the district adopted the eMINTS Program created time
and space for discussions of innovative teaching practices and group problem-solving.
All these factors suggest that indeed the leadership at Owenville was successful at
developing a learning community at the school, and this type of community was cited
repeatedly by interviewees as having a positive relationship to teachers’ transfer of
learning.

**Other perspectives on culture.** As previously discussed, Martin (2002) suggests
that an organization is not only made up of one culture, but is in fact comprised of a
variety of subcultures, each holding its own legitimate view of reality and holding its own
shared norms and values. Much of this research was implemented with a whole school,
dominant cultural perspective; the researcher attempted to explore the elements of the
culture that were shared and about which there was much consensus from the
interviewees. Martin refers to this perspective as the “integration” perspective and
suggests that researchers using this lens may focus particularly on the dominant culture of
the organization, often investigating it from the leadership’s perspective. In addition,
Schein (2004), while acknowledging this lens may not capture the entire complexity of an organization’s culture, argues that it is a valid and useful perspective for conducting research.

However, while the overall dominant culture that appeared to be present within Owenville School District has been discussed at length already, the researcher also turned some attention to examining the possibility that subcultures in the district existed with their own particular shared assumptions and values. The researcher explored the possibility that such subcultures may be in conflict with one another, as suggested by the “differentiation” perspective. In fact, a number of subcultures did appear to exist within the district; some of these groups observed included the group of male coaches, the middle school teachers, the high school teachers, the technology support staff, the new teachers, and finally the teachers that had participated in eMINTS PD and those who had not. Some of these groupings were identified from interviews, but some were observed by watching the teachers interact. For example, at a faculty meeting observation, as teachers came into the room, where they chose to sit seemed to indicate some subcultural groupings: all of the male teachers/coaches sat together in the back of the room, the middle school female teachers sat together, and the high school female teachers sat together. Of course, most individuals belonged to multiple groups. However, there was little evidence that any real tension existed among the groups, with the exception of the little bit of tension that seemed to exist between the teachers involved in eMINTS and those not involved in eMINTS. Some of the teachers who were not originally part of the eMINTS PD felt left out, though many of them have since been completed eMINTS PD. However, there are still a few teachers who have not
participated, including those teaching in the grades below third grade, and there was some indication in the research that they continue to feel somewhat disenfranchised.

Finally, this researcher did not see any strong evidence of high degrees of ambiguity or contradiction at the district, as Martin’s last perspective on culture, “fragmentation” would suggest might exist.

Conclusions

While a wide variety of findings were presented based on the data collected for this case study, several big ideas emerged as particularly important lessons. While a number of factors appeared to be related to the teachers’ transfer of learning, many of those factors were also related to one another. Some of the key conclusions and linkages that arose from this study include: the strong influence of leadership on transfer and on other transfer factors, the understanding that a planned focus on sustainability is critical, and the role that technology played in strengthening the work culture at the school.

Leadership’s role in creating a learning culture. As Schein (2004) explains:

It can be argued that the only thing of real importance that leaders do is to create and manage culture; that the unique talent of leaders is their ability to understand and work with culture; and that it is an ultimate act of leadership to destroy culture when it is viewed as dysfunctional. (p. 11)

In the case of Owenville High School, the administrators played a critical role in transforming the less effective work culture that existed prior to the eMINTS implementation, and fostering a culture of constant learning and collaboration. The school leaders actively engaged in shared decision-making, modeled an openness to trying new things, and encouraged collaborative lesson planning.
In addition, the administrators helped provide a clear vision of the goals for instruction by sending multiple groups of teachers to model sites, such as to the medical school that had implemented a problem-based learning approach and to other high schools implementing eMINTS. These experiences significantly helped the teachers to gain a better understanding of what the “end product” could look like and fostered buy-in from the teachers.

Furthermore, as previously mentioned, the administration consciously aligned their human resource practices and recognition structure, to ensure the perpetuation of the type of culture they wanted. They hired new teachers who had an openness to try new things and a willingness to be a part of the eMINTS Program. They aligned their teacher and principal evaluations to encourage eMINTS teaching practices and recognized teachers who had high-quality lesson plans. Finally, one of the most frequent things mentioned by teachers was how the administration created a safe atmosphere for them to try the new things they had been learning in their professional development, and provided people for them to work with (such as the district eIS) who could help them become more skilled at developing these new kinds of lessons.

In summary, one of the great lessons from this case study is the strong link between the leadership at a school and the development and management of a robust learning culture.

**Planning for sustainability.** Probably the most important take-away from examining the highly successful and ongoing eMINTS implementation at the Owenville School District was the careful planning that led to putting systems in place in an effort to create long-term sustainability. As Schein (2004) notes, one of the ways that leadership
needs to support learning and change is to have a “commitment to systemic thinking,” recognizing the complexity of organizational change and realizing “that most things are multiply caused” (p. 402). The Owenville administrators were keenly aware of this complexity and skillfully attended to the wide variety of elements that would ultimately determine the success or failure of their reform efforts.

One of the lessons learned from their efforts include planning for the need to refresh. For example, with the large amounts of computers at the school, a long-term plan for eventually replacing and upgrading that equipment needed to be in the district technology plan and budget. In addition, the staff members themselves need to have opportunities to refresh and update their skills. Providing ongoing collaboration opportunities and professional development on new technologies or teaching strategies is imperative to prevent the teachers from becoming stagnant in their teaching.

In addition, any school that has many eMINTS classrooms should consider sending a staff member to eMINTS “train-the-trainer” training to become a certified eMINTS Instructional Specialist for the district. At Owenville, this allowed the district to continue providing professional development to new teachers, as they were hired and to additional teachers who were not included in the first cohort. This person onsite also provided teachers who had completed their eMINTS PD with ready access to an extremely eMINTS-knowledgeable individual as they continued to attempt try new things in their classrooms. Having someone onsite to continue to provide support and professional development is a key step in sustainability for any district implementing many eMINTS classrooms, as some staff turnover is inevitable.
**Relationship between technology and culture.** Another important conclusion from this study was the reinforcing relationship between the use of technology and the work culture at the school. While technology is certainly an integral piece of the eMINTS instructional model, along with inquiry-based learning and a supportive classroom community, it also acted as a catalyst for change for the teachers. As the teacher shared the struggle and experience of learning to use all this new technology, it gave them something in common to collaborate about. As one teacher explained, the teachers who had been through the eMINTS implementation, including the professional development, felt a strong sense of a strong bond with one another.

In addition, the technology acted as a catalyst in that it provided a non-threatening reason for teachers to change their teaching practices. The teachers were not being asked to change their teaching practices because they were not skilled teachers; they were being asked to teach differently because the new technology provided new opportunities and resources that teachers could learn how to capitalize on through their eMINTS PD. The technology helped motivate teachers to integrate the more student-centered teaching strategies and facilitated more collaborative opportunities with their peers.

**Implications for Future Research and Practice**

**Implications for research.** The study contributes to the current literature by adding to the qualitative research in the transfer of learning literature, an underrepresented methodology in transfer literature (Baldwin et al., 2009). The single case study design allowed the researcher to explore specific detailed information on the actions taken by study participants, most notably the administrators. For example, not only did this study identify what general transfer factors were related to teachers’
transfer, such as a strong supervisor and peer support, but it was also able to explore many of the specific behaviors in which participants engaged to create that support.

However, some of this study’s limitations suggest opportunities for further areas of research. For example, it would be helpful to be able to look at a wider variety of high schools with a variety of settings. Is it possible to foster the strong collaborative and collegial work culture at high schools that are much larger and/or in non-rural settings? In high schools that are not so closely connected with a single elementary and middle school, is it possible to develop the tight-knit community found at Owenville? In addition, for high schools that do not have students coming from eMINTS classrooms in the middle school, how much would that change what the teachers at the high school would be able to do regarding the integration of technology and inquiry-based learning? Additionally, it would be helpful to look in more depth at the subject-specific issues which arose in this study, especially those suggesting that secondary mathematics is a particularly challenging content area in which to integrate eMINTS strategies. For example, it could be useful to do a study of a large number of eMINTS teachers teaching mathematics to see if the same challenges exist across the board, if certain elements of the content are easier to integrate than others, and so on. Such a study might hopefully find some suggestions for future mathematics teachers interested in incorporating eMINTS instructional strategies into their classrooms.

**Implications for practice.** While the study examined only one particular setting, the insights gained about the various methods of enhancing the transfer of learning of the eMINTS instructional strategies in a rural, secondary school setting may be applicable to a variety of other schools. This study's implications for practice include gaining an
understanding of some of the unique issues involved in attempting to implement the eMINTS Program into a high school setting. As previously explained, little research has been conducted thus far about eMINTS at the high school level, in large part because many fewer eMINTS implementations exist there than at the lower grade levels. However, as some of the interviewees in this study noted, eMINTS instructional strategies hold a great deal of potential for success with older students, so more needs to be learned to understand and encourage more high schools to adopt the program. This research in particular provides an excellent list of aspects of the school context to attend to in the attempt to increase the chances of participating teachers’ transfer of learning. While some of the barriers to transfer in the school context may prove more difficult to overcome than others, such as funding limitations and state requirements for seat time and testing, many of the transfer factors can be influenced by strong leadership, teachers, and program planners. This study outlined a long list of behaviors in which the administrators engaged that could be very much in the control of administrators at another district: actively garnering stakeholder support through soliciting their involvement, having regular and open communication, coming back to stakeholders with data on results, creating buy-in from teachers by having them visit other schools with successful eMINTS and related reform models, engaging in participatory decision-making, creating an environment where it is safe to take risks, and consistently conveying the importance of the implementation in a variety of ways (aligning performance evaluations to match the program expectations, keeping the program at the forefront through regular updates at faculty meetings, recognizing teachers for innovative lesson plans, and making decisions about resource allocation that continue to support the
program). These lessons may be helpful to administrators, but also to eMINTS Program leaders, as they may be able to find ways to help those administrators assess their current environment and prioritize areas that they could work on to make the school context a more hospitable environment for a successful eMINTS implementation.

**Summary**

In conclusion, this case study examined the contextual factors related to the teachers’ transfer of learning in the eMINTS implementation at the Owenville High School. The teachers and administrators who participated in the study provided data through a variety of methods, including a questionnaire, participant interviews, observations, and document analysis. The findings of this case study suggest that several contextual factors did act as barriers to transfer, such as difficulties with technology, the rigid high school class schedule, and certain types of skill-based content. However, a large number of factors also enhanced teachers’ ability to use the knowledge and skills from their eMINTS Professional Development, including strong and multifaceted methods of support from the school administrators, high levels of peer support and collaboration, and high-quality technical support. Hopefully, many of the lessons learned from this study at Owenville High School will be able to provide the staffs of other potential eMINTS high schools with ideas that increase their chances of success, ultimately benefitting more students in the future.
References


O’Dwyer, L.M., Russell, M., & Bebell, D. J. (2005). Identifying teacher, school, and district characteristics associated with middle and high school teachers' use of


Appendix A: Consent Form

Owenville School District
eMINTS Implementation Case Study
Consent Form

Lorie Kaplan, under the direction of Dr. Joe Donaldson, will conduct a study of eMINTS professional development program implementation at Owenville School District for her dissertation research project.

Purpose of Study: The purpose of this study is to examine one high school (Owenville High School) in depth to understand what factors were related to the transfer process of teachers as they implemented knowledge and skills taught in the eMINTS Program into their instructional practices.

Research Goals: The goals of this study are to determine the following:
1) How the eMINTS program was implemented or adapted to fit into the Owenville School District classrooms.
2) The nature of the eMINTS implementation and how Owenville School teachers came to define eMINTS for their classrooms, and
3) The impact various training design and work environment factors had on facilitating or inhibiting the adoption of eMINTS into Owenville School District’s teachers’ instructional practices.

Research Activities: This research study will involve the following activities and participants will be asked to participate in each applicable activity:

1. Questionnaire—All Owenville School District staff will be asked to take the Learning Transfer System Inventory (LTSI) which assesses their perceptions of general and training program-specific factors affecting transfer of learning. The questionnaire should take participants approximately 15-20 minutes to complete.

2. Interviews—All Owenville High School teachers and administrators will be asked to participate in at least one interview session lasting approximately 45-60 minutes to discuss their experience with the eMINTS Program. Participants may be asked to meet for a follow-up session if additional information or clarification is required. (Note: Some additional Owenville School District teachers may also be asked to participate in an interview to help the researcher understand more about the overall eMINTS implementation at the district.)

3. Observations

   1. Teaching Sessions: All Owenville High School core subject teachers will be asked schedule at least one single-period classroom observation (approximately 45-50 minutes), following their one-on-one interviews. The goal of the observations is to allow the researcher to see firsthand the instructional practices of the participating teachers. The researcher may conduct a brief follow-up interview (approximately 15-20 minutes) to clarify questions regarding the observation.

   2. Meetings: The researcher will attend at least one faculty meeting and other Owenville staff collaboration opportunities, if possible.
3. **General Observations:** The researcher will also be conducting general observations of the Owenville School District, including activity during class passing times, lunch hour, and so on, to get a general sense of the school climate and culture.

4. **Document Collection**—Participants will be asked to submit any documents that they believe would help inform the study (i.e., grant proposal, teachers’ lesson plans or case studies, press releases or articles, websites, and newsletters to parents).

**Study Risks:** No risks are anticipated for participants in this research study. No discomforts or stress are foreseen for participants.

**Benefits of Study:** This study will expand the transfer of learning literature, specifically in the area of technology integration into classroom instruction. The study will also inform eMINTS Program administrators about ways to improve the eMINTS Program for future participants, particularly at the high school level.

**Voluntary Participation:** Note that participation in this study is completely voluntary and participants may withdraw their consent at any time with no penalty. Participants also may refuse to answer any or all questions on the questionnaire and during interviews. No penalties will result from an individual’s decision not to participate in the study.

**Confidentiality:** While data collected (such as specific quotations from interviewees) will be used to illustrate findings, all responses will remain confidential. For the purposes of data collection, analysis and reporting, pseudonyms will be used to protect the identity of participants on all data collection materials. The results of this study may be presented at scientific meetings and in published reports for educational, policy, and scientific purposes.

- By signing this form, you are agreeing that, "**Yes, I would like to participate in this research project,**" indicating that you have read the information provided above and agree to participate in the research study of the eMINTS professional development program at Owenville School District.

If you have any questions or concerns, please feel free to call Lorie Kaplan at (573) 529-9069 (or email kaplanl@missouri.edu) or Dr. Joe Donaldson at (573) 884-9330 (or email donaldsonj@missouri.edu). For additional information about human participation in research, feel free to contact the UMC Campus Institutional Review Board Office at (573) 882-9585. In addition, Cynthia Gardner, the eMINTS Instructional Specialist at Owenville School District, will be acting as the study contact person at the district as is available to respond to questions or concerns.
Appendix B: Teacher Interview Guide

Research Question: What factors enhanced or hindered teachers’ transfer of learning in the eMINTS Program implementation at Owenville High School?

Demographic info:

- Name:
- Gender:
- What subjects and grades do you teach?
- How many years have you worked in education?
- How many years have you been teaching at Owenville School District?
- What level of eMINTS professional develop have you been through? And when did you complete your training (or how far along are you in your training)?
- Who was/is your eMINTS Instructional Specialist (eMINTS Trainer)?
- How would you describe your level of use of eMINTS strategies, defined broadly as technology integration and inquiry-based instruction (IBI)?

The participant teacher is asked to respond to the following opening statement:

*I would like to find out about your journey with eMINTS, implementing technology and inquiry-based instruction (IBI) into your classroom, over the past few years.

*Please tell me your experience with the eMINTS program, starting with the first time you heard about eMINTS, your involvement in the Title II.D grant, your training experience, and your experience implementing the eMINTS instructional strategies while and since completing the training.*

1. Exploring responses to the opening statement:

   A. Did you have any “aha” moments in your efforts to integrate eMINTS strategies (technology integration and inquiry-based instruction) into your classroom? If, yes, please describe those moments and how did it help with your transfer of eMINTS instructional practices into your classroom.
   B. How would describe teaching using eMINTS Instructional Strategies? What would you expect to see in an effective eMINTS classroom?
   C. Describe a few of the eMINTS lessons you have created and/or taught? What impact do you believe those lessons have had on your students and on your views about teaching?
   D. What challenges have you faced in trying to integrate eMINTS teaching strategies into your classroom? What challenges do you see as unique to implementing eMINTS into the specific subject and grade-level(s) you teach?
2. Exploring the leadership factors related to transfer:

A. Talk to me about the administration at Owenville School District in general. For example, how do they approach doing new things? How they work with staff? How do they interact with students?
B. Tell me how the Owenville School District administrators supported (or hindered) your ability to use what you learned in your eMINTS training?
C. In what ways have they continued to help (or hinder) your ability to maintain and/or grow your use of inquiry-based instruction in your classroom?
D. Tell me about your experience receiving classroom visits from your eMINTS Instructional Specialist? How did these visits assist you in your integration of technology and IBI?
E. How have technology resources and technical support impacted your ability to use eMINTS teaching strategies in your classroom?

3. Exploring the impact of organizational culture on transfer:

A. How you would describe what it’s like to work at Owenville High School? What types of things would you tell a new teacher about this school?
B. In what ways have peers supported (or hindered) your ability to use what you learned in your eMINTS training?
C. How have they continued to help (or hinder) your ability to maintain and/or grow your use of inquiry-based instruction in your classroom?
D. How have you seen the eMINTS implementation impacting the faculty and overall culture of the school?

4. Bringing closure to the interview:

A. What advice would you have for school administrators considered bringing eMINTS to their high school?
B. Based on your experience, what suggestions or advice would you have for other high school teachers who are going to go through eMINTS professional development? What strategies would you suggest to them to help them implement eMINTS teaching practices into their classrooms?
C. Are there any documents or other resources that you could share with me that would help me gain additional insight for this study?

5. What questions do you have for me about this research?

Thank you for your participation in this interview.
Appendix C: Administrator/eMINTS Instructional Specialist (eIS) Interview Guide

Research Question: What factors enhanced or hindered teachers’ transfer of learning in the eMINTS Program implementation at Owenville High School?

Demographic info:

- Name:
- Gender:
- How many years have you worked in education?
- What is your position/role at Owenville School District?
- How many years have you been at Owenville R-1 (total)? How many year have you been in your current role?
- What has been your level of involvement eMINTS Program implementation at Owenville?
- How would you describe the overall level of use of eMINTS strategies, defined broadly as technology integration and inquiry-based instruction (IBI), in Owenville School District? At the Owenville High School specifically?

The interviewee is asked to respond to the following opening statement:

I would like to find out about your journey with the implementation of the eMINTS Program at Owenville School District over the past few years. Please tell me your experience with the eMINTS program, starting with the first time you heard about eMINTS, your involvement in the Title II.D grant, your experience with the eMINTS professional development, and your experience as a district leader in the eMINTS implementation at Owenville.

1. Exploring responses to the opening statement:

A. Did you have any “aha” moments in your efforts to help integrate eMINTS strategies (technology integration and inquiry-based instruction) into Owenville teachers’ classroom practices? If, yes, please describe.
B. How would describe teaching using eMINTS Instructional Strategies? What would you expect to see in an effective eMINTS classroom?
C. Describe a few of the eMINTS lessons that the teachers at Owenville have taught? What impact do you believe those lessons have had on the Owenville students and community (parents, etc.)?
D. What challenges have you experienced in trying to implement the eMINTS Program at Owenville School District? What challenges do you see as unique to implementing eMINTS at the high school level?
E. How have the modules and other resources provided by the eMINTS Program been helpful (or unhelpful) in the implementation of eMINTS at Owenville? At the high school level specifically?
2. Exploring the leadership factors related to transfer:

   A. Talk to me about the administration at Owenville in general. For example, how do they approach doing new things? How they work with staff? How do they interact with students?
   B. Tell me how the Owenville School District administrators supported (or hindered) teachers’ ability to use what they learned in their eMINTS training in the classroom?
   C. In what ways have Owenville School District administrators continued to help (or hinder) teachers’ ability to maintain and/or grow their use of inquiry-based instruction in their classrooms?
   D. How have classroom visits from the eIS impact teachers’ ability to integrate of technology and IBI?
   E. How have technology resources and technical support impacted teachers’ ability to use eMINTS teaching strategies in their classrooms?

3. Exploring the impact of organizational culture on transfer:

   A. How you would describe what it’s like to work at Owenville High School? What types of things would you tell a new teacher about this school?
   B. In what ways have peers supported (or hindered) each other’s ability to use their eMINTS training in the classroom?
   C. How have they continued to help (or hinder) one another to maintain and/or grow in their use of inquiry-based instruction in the classroom?
   D. How have you seen the eMINTS implementation impacting the faculty and overall culture of the school?

4. Bringing closure to the interview:

   A. What advice would you have for school administrators considered bringing eMINTS to their high school?
   B. Based on your experience, what suggestions or advice would you have for other high school teachers who are going to go through eMINTS professional development? What strategies would you suggest to them to help them implement eMINTS teaching practices into their classrooms?
   C. Are there any documents or other resources that you could share with me that would help me gain additional insight for this study?

5. What questions do you have for me about this research?

   Thank you for your participation in this interview.
Appendix D: Classroom Observation Template

Observation/Teacher:

Date/Time:

Class:

I. Classroom Observations (in real time)

II. Summary:

<table>
<thead>
<tr>
<th>Teacher-facilitated learning</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Student-centered Learning</td>
<td></td>
</tr>
<tr>
<td>Unique Teaching pedagogy and learning strategies to implement standards based curriculum</td>
<td></td>
</tr>
<tr>
<td>Community of Learners</td>
<td></td>
</tr>
<tr>
<td>Technology Richness</td>
<td></td>
</tr>
<tr>
<td>Assessment of Student Performance in the Context of IBL</td>
<td></td>
</tr>
</tbody>
</table>

III. Follow up Questions:
Appendix E: Learning Transfer System Inventory (LTSI) Results

This table displays the average scores from the study participants and scale reliability estimates for the 16 constructs included in Version 3 of the LTSI survey:

<table>
<thead>
<tr>
<th>LTSI Construct</th>
<th>High School Teachers’ Averages Only</th>
<th>Cronbach’s alpha for High School Only</th>
<th>Whole District Teachers’ Averages</th>
<th>Cronbach’s alpha for Whole District</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supervisor support</td>
<td>3.46</td>
<td>.36</td>
<td>3.53</td>
<td>.76</td>
</tr>
<tr>
<td>Supervisor sanctions</td>
<td>1.00</td>
<td>1.00</td>
<td>1.02</td>
<td>.79</td>
</tr>
<tr>
<td>Content validity</td>
<td>4.29</td>
<td>.59</td>
<td>4.14</td>
<td>.75</td>
</tr>
<tr>
<td>Personal outcomes positive</td>
<td>3.92</td>
<td>.69</td>
<td>3.83</td>
<td>.82</td>
</tr>
<tr>
<td>Personal outcomes negative</td>
<td>2.33</td>
<td>.88</td>
<td>2.00</td>
<td>.88</td>
</tr>
<tr>
<td>Personal capacity</td>
<td>1.96</td>
<td>.98</td>
<td>1.91</td>
<td>.96</td>
</tr>
<tr>
<td>Learner Readiness</td>
<td>3.29</td>
<td>.71</td>
<td>3.41</td>
<td>.77</td>
</tr>
<tr>
<td>Peer support</td>
<td>4.34</td>
<td>.87</td>
<td>4.14</td>
<td>.86</td>
</tr>
<tr>
<td>Motivation to transfer</td>
<td>4.38</td>
<td>.91</td>
<td>4.38</td>
<td>.91</td>
</tr>
<tr>
<td>Transfer design</td>
<td>4.50</td>
<td>.87</td>
<td>4.36</td>
<td>.93</td>
</tr>
<tr>
<td>Opportunity to use</td>
<td>4.03</td>
<td>.95</td>
<td>4.00</td>
<td>.90</td>
</tr>
<tr>
<td>Performance coaching</td>
<td>2.75</td>
<td>.79</td>
<td>2.69</td>
<td>.85</td>
</tr>
<tr>
<td>Resistance to change</td>
<td>1.71</td>
<td>.88</td>
<td>1.60</td>
<td>.87</td>
</tr>
<tr>
<td>Performance self-efficacy</td>
<td>3.91</td>
<td>.81</td>
<td>3.93</td>
<td>.83</td>
</tr>
<tr>
<td>Transfer effort - performance expectations</td>
<td>4.28</td>
<td>.71</td>
<td>4.21</td>
<td>.76</td>
</tr>
<tr>
<td>Performance - outcome expectations</td>
<td>3.54</td>
<td>.68</td>
<td>3.64</td>
<td>.66</td>
</tr>
</tbody>
</table>
## Appendix F: LTSI Factors and Definitions Table

<table>
<thead>
<tr>
<th>Factor</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learner readiness</td>
<td>The extent to which individuals are prepared to enter and participate in training</td>
</tr>
<tr>
<td>Motivation to transfer</td>
<td>The direction, intensity, and persistence of effort toward utilizing in a work setting skills and knowledge learned</td>
</tr>
<tr>
<td>Positive personal outcomes</td>
<td>The degree to which applying training on the job leads to outcomes that are positive for the individual</td>
</tr>
<tr>
<td>Negative personal outcomes</td>
<td>The extent to which individuals believe that not applying skills and knowledge learned in training will lead to outcomes that are negative</td>
</tr>
<tr>
<td>Personal capacity for transfer</td>
<td>The extent to which individuals have the time, energy, and mental space in their work lives to make changes required to transfer learning to the job</td>
</tr>
<tr>
<td>Peer support</td>
<td>The extent to which peers reinforce and support use of learning on the job</td>
</tr>
<tr>
<td>Supervisor support</td>
<td>The extent to which supervisors-managers support and reinforce use of training on the job</td>
</tr>
<tr>
<td>Supervisor sanctions</td>
<td>The extent to which individuals perceive negative responses from supervisors-managers when applying skills learned in training</td>
</tr>
<tr>
<td>Perceived content validity</td>
<td>The extent to which trainees judge training content to reflect job requirements accurately</td>
</tr>
<tr>
<td>Transfer design</td>
<td>The degree to which (1) training has been designed and delivered to give trainees the ability to transfer learning to the job, and (2) training instructions match job requirements</td>
</tr>
<tr>
<td>Opportunity to use</td>
<td>The extent to which trainees are provided with or obtain resources and tasks on the job enabling them to use training on the job</td>
</tr>
<tr>
<td>Transfer effort – performance expectations</td>
<td>The expectation that effort devoted to transferring learning will lead to changes in job performance</td>
</tr>
<tr>
<td>Performance – outcomes expectations</td>
<td>The expectation that changes in the job performance will lead to valued outcomes</td>
</tr>
<tr>
<td>Resistance – openness to change</td>
<td>The extent to which prevailing group norms are perceived by individuals to resist or discourage the use of skills and knowledge acquired in training</td>
</tr>
<tr>
<td>Performance self-efficacy</td>
<td>An individual’s general belief that he is able to change his performance when he wants to</td>
</tr>
<tr>
<td>Performance coaching</td>
<td>Formal and informal indicators from an organization about an individual’s job performance</td>
</tr>
</tbody>
</table>

Appendix G: Campus Institutional Review Board Approval Letter

Dear Investigator:

Your research proposal involving human subjects was approved by the Campus IRB. Your project falls under the following Expedited category(s), unless it was reviewed and approved by the convened board:

45 CFR 46.110.a(0)(6)
45 CFR 46.110.a(0)(7)

Your IRB approval for this project will expire on January 12, 2012. If you intend to continue research activities after the expiration date, you must complete and submit a Continuing Review Status Report for review at least 30 days prior to the expiration date. If the project is completed prior to the expiration date, you must complete and submit the Completion/Withdrawal Report.

The Campus IRB Approval is CONTINGENT upon your agreement to:

1. Adhere to all University of Missouri IRB Policies.

2. MODIFICATIONS: Submit an Amendment Form for any proposed changes to a previously approved project prior to initiation of those changes.

3. RECORD INSPECTION: The Campus IRB reserves the right to inspect your records to ensure compliance with federal regulations. You are expected to maintain copies of all pertinent information related to the study, including but not limited to, video and audio tapes, instruments, copies of written informed consent agreements, and any other supportive documents for a period of seven (7) years from the date of completion of your research.

4. REPORTING: Promptly report to our office any unanticipated problem, deviation, or noncompliance.

5. CONSENT: Use the IRB approved consent document unless the consent process was waived. This can be found in document storage and labeled as approved with the approval date in the footer.

Type of Consent Approved:

Waiver of Documentation
Written Consent

If applicable: Child Category:

https://irb.missouri.edu/eirb/letter/53241

3/21/2011
If you have any questions or concerns, you may call the IRB office at 573-882-9585 or e-mail us at umcresearchirb@missouri.edu.

Thank you,
The Campus Institutional Review Board

https://irb.missouri.edu/eirb/letter/53241

3/21/2011
Vita

Dr. Lorie F. Kaplan is a professional in the fields of educational leadership and adult learning, and received her doctor of philosophy degree in Educational Leadership and Policy Analysis from the University of Missouri-Columbia in May 2011. For the past 15 years, she has worked for the University of Missouri, most recently as the Program Director for the enhancing Missouri’s Instructional Networked Teaching Strategies (eMINTS) Program at the eMINTS National Center. Prior to taking on an administrative role with eMINTS, she worked as an eMINTS Instructional Specialist, providing professional development and in-classroom coaching and mentoring to teachers learning how to integrate technology with inquiry-based instruction. Previously, she spent time in Japan teaching English to junior- and senior-high school students. She also received her Master's degree in Educational Technology in 1996 and her Bachelor's degree in English in 1993, both from the University of Missouri-Columbia. Dr. Kaplan currently lives in Columbia, Missouri, with her husband and son.