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## **Plugged In: A Case Study of an Exemplary Technology-Using Teacher**

Kameron Conner Ball

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PLUGGED IN: A CASE STUDY OF AN EXEMPLARY  
TECHNOLOGY-USING TEACHER

By

Kameron Conner Ball

A Dissertation  
Submitted to the Faculty of  
Mississippi State University  
in Partial Fulfillment of the Requirements  
for the Degree of Doctor of Philosophy  
in Educational Administration  
in the Department of Instructional Systems, Leadership, and Workforce Development

Mississippi State, Mississippi

May 2006

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2006

PLUGGED IN: A CASE STUDY OF AN EXEMPLARY  
TECHNOLOGY-USING TEACHER

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Technology has become pervasive in society and classrooms today. However, studies show that most teachers are not yet comfortable integrating technology into their repertoire of instructional strategies (Education Week, 2005). The purpose of this study was to determine how an exemplary elementary teacher uses technology to improve student learning and why she has chosen to integrate technology into her classroom instruction in the ways she has.

A single-case design was used in this qualitative study. Purposeful sampling was used in the selection of the study's participant, an exemplary elementary teacher who utilizes technology in her classroom. The participant's elementary principal and a school district administrator were also interviewed to provide additional perspectives to the case study. Personal interviews, observations, and document analysis were used to collect data.

The findings of this study included examples of how the participating teacher used technology in her classroom. These findings included ways that she integrated technology into daily activities across of wide variety of curriculum content areas, and ways the classroom environment was designed to encourage interaction, communication, and cooperation. The barriers of professional development, access, support, and time did not hamper the participating teacher's ability to integrate technology. Technology was used daily in the participating teacher's classroom for enhancing student work, easing management tasks, and communicating with parents. Additionally, I found that the participating teacher was motivated to use technology by several factors. Administrative support, the teacher's personal use of technology, and student engagement and motivation served as factors as to why the participating teacher integrated technology into her daily classroom instruction.

Recommendations included: (a) incorporating educational technology into a variety of undergraduate teacher education courses, (b) including a variety of instructional strategies for integrating technology in methods courses of preservice teacher education programs, (c) studying further how to reduce the barriers to technology integration - lack of professional development, access, support, and time, (d) requiring candidates in educational administration graduate programs to take an educational technology course, and (e) conducting further study to determine the link between the use of technology in a teacher's personal life and any increased classroom technology integration.

## DEDICATION

This is dedicated to my family who have seen in me what I could not see, to my mentor, Dr. Larry S. Anderson, who has blessed my life more than he will ever know, and to my grandparents who are not here to see this day, but who would have been proud.

## ACKNOWLEDGEMENTS

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I also want to acknowledge to my support system at work - Dr. Lynn Weathersby, Mr. Matthew Evans, and my co-workers. Your encouragement throughout this long process has been remarkable. Having the opportunity to work in a caring, supportive environment makes work a pleasure. I am one of the lucky ones because I truly love going to work everyday. Thank you for making that possible and for making a difference in the lives of children and teachers every day.

Naturally, I want to thank the very special teacher who allowed me to get up close and personal with her and her students. She is more than exemplary. Her students will remember their short time with her for years to come. I only hope that my children will be fortunate enough to have teachers who care as much as she does. Also, I want to thank her principal and the district administrator who participated in this study. I enjoyed every minute of our countless hours of conversations. Your insights and thoughts have added significantly to this research, and your support of educational technology is paying dividends in student learning opportunities.

For nearly 15 years, I have been blessed by my friendship with Dr. Larry Anderson, my mentor who has become more like family than friend. I only wish my vocabulary were as robust as his so I could find the perfect words to thank him. As I look back over the course of my professional career, every positive turn has been touched by his influence. I am so thankful that my mother's birthday present was that prize-winning cow. How Marcella has changed my life because her story connected me to you! You truly touch the soul of every person you meet and I am so grateful to call you my friend.

Lastly, my family - all of them - have been an unending source of love, support and encouragement. To my parents, my sister, Bill's family, our grandparents, - you have all been such a source of support! Thanks for everything - for cleaning my house and washing countless loads of laundry, for taking Conner Beth home with you so I could write, for praying of me, for knowing when to ask questions about my "book report" and when to just say "it will be okay." Thanks for having such faith in me. To my husband, Bill, I could never have attempted this entire program without your vote of confidence. You have always believed in me, even when I didn't. Your love and support throughout

this process have meant so much. Thanks for everything you've done to make this possible - including being both Mom and Dad when needed. Conner Beth, you are probably too young to remember most of this, but I appreciate your hugs and kisses when Mom had to study late or write on the computer. Thanks for eating so many dinners of peanut butter sandwiches and for letting Dad fix your hair for school when Mom had to be in Starkville. I hope this degree will serve as evidence to you and your little brother, who is on the way, that you can do anything if you put your mind to it.

## TABLE OF CONTENTS

	Page
DEDICATION.....	ii
ACKNOWLEDGEMENTS .....	iii
LISTS OF FIGURES .....	viii
CHAPTER	
I. INTRODUCTION AND LITERATURE REVIEW .....	1
Review of Related Literature.....	1
Barriers to Technology Integration.....	3
Policy on Educational Technology .....	7
Improving access .....	8
Creating quality educational content .....	9
Providing teachers high quality professional development .....	9
Utilizing digital, online learning environments .....	10
Improving Student Achievement through Technology .....	12
Summary of the Literature Review.....	17
Statement of the Purpose .....	18
Justification of the Study .....	19
Questions to be Answered .....	19
II. METHOD .....	20
Research Design .....	20
The Researcher .....	21
Research Participant .....	22
Procedure .....	23
Analysis .....	26
III. FINDINGS AND DISCUSSION.....	29
Orderton City Elementary School.....	29

CHAPTER	Page
Courtney's Classroom .....	32
Courtney.....	34
How Technology Was Used in Courtney's Classroom.....	40
Why She Has Chosen to Integrate Technology into Instruction.....	46
Discussion of Related Literature.....	52
 IV. SUMMARY, IMPLICATIONS, AND RECOMMENDATIONS .....	 56
Summary .....	56
Implications .....	65
Recommendations.....	68
 REFERENCES .....	 70
 APPENDIX	
A Educational Technology Policy Documents.....	75
B Researcher's Vitae .....	79
C Institutional Review Board for the Protection of Human Subjects in Research Approval.....	85
D Interview Protocol Participating Teacher .....	87
E Interview Protocol School Principal.....	89
F Interview Protocol District Administrator .....	91
G Observation Protocol.....	93
H Document Analysis Protocol .....	95

LIST OF FIGURES

FIGURE	Page
1. Educational Technology Policy Documents .....	76

# CHAPTER I

## INTRODUCTION AND LITERATURE REVIEW

Technology has become pervasive in society and classrooms today. However, studies show that teachers are not yet comfortable integrating technology into their repertoire of instructional strategies (Education Week, 2005). National reports and standards documents have recognized that technology proficiency is essential for all students (International Society for Technology in Education, 2000; No Child Left Behind, 2002; U.S. Department of Education, 2004). Teacher instruction is a critical factor in maximizing the potential that educational technology has to impact student achievement. The purpose of this study was to determine how an exemplary elementary teacher uses technology to improve student learning and why she has chosen to integrate technology into her classroom instruction in the ways she has.

The following chapter is presented in four sections: (a) Review of Related Literature, (b) Statement of Purpose, (c) Justification of the Study, and (d) Questions to be Answered. The review of literature will develop the rationale for this study.

## Review of Related Literature

Technology has become omnipresent in the 21<sup>st</sup> century. Modern innovations in technology have altered practically every aspect of life – business, education, family, leisure, and travel. With technology so pervasive in society, it is no wonder that technology proficiency has become a core requirement in schools today (Corporation for Public Broadcasting, 2003; U.S. Department of Education, 2004). The seamless integration of technology into the teaching and learning process is essential for success in the 21<sup>st</sup> century classroom. Teachers who effectively integrate technology into instruction report that students become more engaged and productive in the classroom (CEO Forum on Education and Technology, 2000). However, many teachers have found the infusion of educational technology into curriculum and instruction a difficult task (Cuban, 2001; U.S. Department of Education, 1996, 2000; Web-based Education Commission, 2000).

Some 10 years ago, the Office of Technology Assessment (OTA) (1995) reported in *Teachers and Technology: Making the Connection* that schools had had access to computers and educational software for over 20 years, but national figures show that in 1984 there was just one computer for every 125 students (Education Week, 2004). Technological changes during the last 10 years have resulted in the rapid proliferation of computers in schools throughout the nation. In 2004, survey results show that there was one computer for every 3.8 students (Education Week, 2005). In 2003, 93% of public school classrooms had Internet access, compared with 3% in 1994 (National Center for Education Statistics, 2005). In Mississippi, for example, due in part to former Governor Ronnie Musgrove's "Computer in the Classroom" initiative, every classroom has been equipped with at least one Internet-ready computer (Richard, 2003).

Even with access at such a high level, studies still show that most teachers are not comfortable with integrating technology into their instructional practices in an effort to improve student learning (Feldman, 2001; National Center for Education Statistics, 2000). Teachers and administrators have noted that educational technology can benefit all students. However, national figures report that a significant number of teachers are not yet integrating technology into the classroom instruction (Education Week, 2005). The successful integration of technology into education is often hampered by barriers to technology use (Solomon & Schrum, 2002).

### *Barriers to Technology Integration*

Even teachers with generally positive attitudes toward technology experience difficulty and barriers in the implementation and integration process. Most noted barriers to successful technology integration include lack of professional development, lack of access to equipment, lack of support, and lack of time (OTA, 1995). Several studies have noted that these issues must be addressed in order to successfully incorporate technology into the teaching and learning process (Byrom, 1998; National Center for Education Statistics, 2000; OTA 1995.)

A major challenge in the effective use and integration of technology into the classroom has been the inadequate professional development of teachers (CEO Forum on Education and Technology, 1999; National Center for Education Statistics, 2000). Teachers regularly feel unprepared using computers and are unaware of the instructional standards and content-based practices that computers and the Internet are able to support. In 1999, only one-third of public elementary and secondary teachers reported feeling well prepared or very well prepared to use computers and the Internet for classroom

instruction (U.S. Department of Education, 2000). In *Technology Counts 2005* (Education Week, 2005), national survey results stated that in nearly 20% of schools over half of the teachers are “beginners” when it comes to using technology. Byrom (1998) noted that lack of preparation is one of the major barriers to effective technology integration in classrooms. She found that schools where technology is effectively integrated into instruction have made a strong commitment to teacher professional development. Additionally, she noted that this professional development was onsite, continual, and comprised a substantial portion of the technology budget.

Although lack of professional development opportunities has been often reported in terms of quantity, quality also seems to be an important issue. Traditional professional development offerings have been criticized for lacking continuity and follow-up (Fullan, 2001). In addition, preservice training has been criticized as being fragmented and unrelated to authentic classroom experiences (National Commission on Teaching and America’s Future, 1996). Saylor and Kehrhahn (2003) reported that successful professional development efforts focus on encouraging and supporting teachers to deliberately practice ways to integrate technology into their teaching practice. They listed four characteristics of successful professional development: (a) engaging learners in activities that build upon their current knowledge; (b) providing immediate informative feedback; (c) supporting learners in guided practice, independent practice, and experimentation; and (d) encouraging reflective dialogues among learners. Professional development sessions that are provided in a timely manner, onsite, and include follow-up opportunities assist in reducing the barrier of sufficient training as teachers attempt to

integrate technology into classroom instruction (National Center for Education Statistics, 2000).

Limited access to technology equipment and connectivity has proven to be another significant barrier to teachers' use of technology. In 1999, public school teachers reported most frequently that one of the barriers to the use of computers and the Internet for instruction was limited access to computers (National Center for Education Statistics, 2000). The National Center for Education Statistics also reported that teachers may be more likely to integrate computers and the Internet into classroom instruction if they have access to adequate equipment and connections. In addition, teachers report that technical difficulties are a main reason why they do not use the computer more often (CEO Forum on Education and Technology, 1997). All too often, the computer hardware and software found in classrooms are limited to older machines in poor condition (Consortium for School Networking, n.d.). Also noted in Education Week (2005), "Technology must be regularly updated or replaced within schools in order to remain an effective tool for learning" (p.36). School districts find that equipment upgrades, technical support, and training are capital expenses and are therefore continuing costs (Dickard, 2003). Furthermore, Gahala (2001) noted that in many schools technology is often found in computer labs rather than in classrooms. The National Center for Education Statistics (2000) noted, "teachers were significantly more likely to use computers in the classroom than elsewhere in the school" (p. 57). Many high schools have elaborate technology labs filled with updated computers and printers, but the classrooms are void of any computers. Students and teachers cannot possibly utilize the lab in an efficient manner and without technology present in the classroom many "teachable moments" go unrecognized. When

technology is available in the classroom, unfortunately, teachers report that the computers are too old to handle sophisticated software needed for instructional purposes.

In addition to issues with access, a lack of support further complicates the goal of effective technology integration. Support for technology comes in two forms - technical support and administrative support. Ronnkvist, Dexter, and Anderson (2000) reported that very few schools have a full-time school level computer coordinator or technician. Additionally, they noted that technology support in schools comprises both the technical and instructional domains of support. Schools need clear technology plans that provide a vision and direction for technology programs (National Center for Technology Planning, 2004). For teachers to experience success with technology, school leaders must demonstrate the importance and relevance of technology into the teaching and learning process. Ronnkvist et al. (2000) concluded that the successful integration of technology into classroom instruction requires the availability of quality technology support.

The lack of time is one barrier that can quickly thwart technology implementation efforts. Hattler (1999) stated that the biggest barrier to technology use is simply time; that is "time for training, for trying out technologies, and for exploring uses of technology and discussing the role technology can play in teaching instructions" (p. 326). The National Center for Education Statistics (2000) noted two types of time barriers: the lack of release time for teachers to learn how to integrate computers into instruction and the lack of time in the schedule for students to actually use technology in class. The lack of time is one major reason a substantial number of teachers report they do not use computers and other technologies regularly for instruction (Solomon & Schrum, 2002).

These barriers to technology integration - lack of professional development, access, support, and time – impede the process of technology integration.

Recommendations as to the methods of reducing technology integration barriers vary according to the type and intensity of the barrier. However, regardless of the barriers involved, meaningful technology integration will be difficult to attain if teachers do not have sufficient equipment, time, training, or support. Schools using technology have noted that recognizing and working through the barriers to technology integration is an ongoing and difficult process, but one that is beneficial for student learning gains (Southern Region Education Board, 2005).

#### *Policy on Educational Technology*

In 1983, the federal report *A Nation at Risk* (National Commission on Excellence in Education, 1983) incorporated a recommendation that high school graduation requirements include coverage of the “Five New Basics”—English, mathematics, science, social studies, and computer science. Almost 20 years later, the *No Child Left Behind Act of 2001* (NCLB) (2002) included a recommendation that by the end of the eighth grade all students should be technologically literate. The federal legislation in NCLB also repeatedly cited technology as a noteworthy source of support for teaching and learning across the curriculum. The amount of emphasis placed on educational technology in the legislation implies a mounting consensus among educators and the general public concerning the value of technological literacy.

Since *A Nation at Risk* (National Commission on Excellence in Education, 1983), American schools have made significant progress improving both their technological capacity and their capability to utilize technology in the learning process (Culp, Honey,

& Mandinach, 2003; National Center for Education Statistics, 2005). These dramatic improvements are due in part to recommendations presented in numerous federal policy initiatives and national reports issued to garner attention and resources for technology in schools. Over the past 15 years, federal and state policy initiatives have primarily focused on the barriers to effective technology usage: access, time, training, and support.

Federal and national policy reports have identified action steps that will help fulfill the promise of technology - improved student performance, increased teacher productivity, and enhanced access for all students (Lemke, Vandersall, & Ravden, 2005). Policy documents and reports have highlighted the need for improving access, creating quality educational content and software, providing teachers with high quality professional development, and most recently utilizing digital, online learning environments (Culp et al., 2003).

### *Improving access*

Numerous national reports have documented the need to install sufficient hardware in schools (e.g., Dickard, 2003; National Association of State Boards of Education, 2001; National Information Infrastructure Advisory Council, 1996; OTA, 1995; U.S. Department of Education, 2000;). Earlier reports noted the belief that furnishing schools with necessary computers and technology devices would serve as the initial measure toward the extensive and effective deployment of educational technology (OTA, 1988). By the late 1990s, the issue of access to modern computer equipment and networking technology for public schools continued to be a focus of national discussions. As a result, the E-Rate program was created, which is a federal program providing

discounts on select telecommunications equipment and Internet access to public schools and libraries (Schools and Libraries Division, 2003).

### *Creating quality educational content*

Early reports documented the need for additional large-scale educational software products (OTA, 1988). Curriculum software was noted as a tool for improving student achievement (CEO Forum on Education and Technology, 1997). However, recent reports have shifted the emphasis from packaged curriculum software to quality educational content – including multimedia content, teacher-created content, and online educational content (CEO Forum on Education and Technology, 2000; National Association of State Boards of Education, 2001). With the emergence of virtual learning environments and sophisticated online learning tools, the need for integrating digitized learning content into instructional delivery is growing and receiving national attention (National Association of State Boards of Education, 2001; Web-based Education Commission, 2000).

### *Providing teachers high quality professional development*

In most federal and national policy reports of the past 15 years, the need for quality professional development has been a lasting theme. From the earliest reports of the OTA (1988) to the latest national plan for educational technology (U.S. Department of Education, 2004), emphasis has been placed on providing teachers with technology training opportunities. Attention has been given to the needs for technology development of both inservice and preservice teachers. The CEO Forum on Education and Technology (1997, 1999, 2000) reports, the Web-based Education Commission (2000), and No Child

Left Behind (2002) have all listed professional development among priorities for improving classroom instruction and student performance.

*Utilizing digital, online learning environments*

With the proliferation of Internet access in schools today, the topic of utilizing digital, online learning environments has received much attention. The National Association of State Boards of Education (2001) stated in the report, *Any Time, Any Place, Any Path, Any Pace: Taking the Lead on e-Learning Policy*, that “e-learning will improve American education in valuable ways and should be universally implemented as soon as possible” (p. 4). This document reports various ways that digital and online learning environments can transform the teaching and learning landscape, including – ensuring equity to all students, providing high-quality instruction, increasing communication, and overcoming geographic limitations. The report noted that technology can help to eliminate the isolation of schools within communities through increased communication. With the prevalence of virtual schools, additional attention has been given to promoting the proper use of online learning opportunities (National School Boards Foundation, 2002; State Educational Technology Directors Association, 2005).

At the request the U.S. Department of Education, Culp et al. (2003) conducted a review of policy documents and technology reports, entitled *A Retrospective on Twenty Years of Education Technology Policy* (see Figure 1 in Appendix A). The report provided an analysis of common recommendations made in major educational technology reports issued by federal agencies, blue ribbon panels, and private-sector consortia since the publication of *A Nation at Risk*. The majority of noted recommendations urged policymakers to provide the conditions, support, and research-based knowledge

necessary to create and maintain quality, technology-rich learning environments in schools. The seven key recommendations, as presented in *A Retrospective on Twenty Years of Education Technology Policy* (Culp et al., 2003), were:

1. Improve access, connectivity, and requisite infrastructure;
2. Create more, high-quality content and software;
3. Provide more, sustained, high-quality professional development and overall support for teachers seeking to innovate and grow in this domain;
4. Increase funding from multiple sources for a range of relevant activities;
5. Define and promote the roles of multiple stakeholders, including the public and private sectors;
6. Increase and diversify research, evaluation, and assessment; and
7. Review, revise and update regulations and policy that affect in-school use of technology, particularly regarding privacy, and security.

National policy documents and reports demonstrate the degree of discussion on how best to support and advance the quality use of educational technology. This topic continues to be a prominent concern for both practitioners and policymakers, which is now exacerbated by new mandates found in *No Child Left Behind* (2002). A growing consensus suggests that the focus of current research should shift from quantitative factors of access, training, support, and funding issues toward more qualitative factors of improving teacher instruction and student technology literacy (North Central Regional Education Laboratory, 2004).

### *Improving Student Achievement through Technology*

As a result of the mandates found in *No Child Left Behind* (2002), educators and policymakers are being forced to seriously examine the potential of educational technology and its utilization, or lack thereof, in classrooms. Technology literacy has been identified as a vital and important skill for all students (International Society for Technology in Education, 2000). In addition to the importance of all students demonstrating technology proficiency, recent federal mandates found in *No Child Left Behind* (2002) have focused efforts on proving whether technology does, in fact, improve student learning outcomes.

With increased attention on accountability for student learning, educational practices have been required to demonstrate a scientific, research-base of proven effectiveness. Educational leaders and policymakers have debated whether the investment in technology has delivered results of increased student achievement (Pflaum, 2004). Recent publications and studies have laid the framework of empirical evidence that the integration of technology has significantly improved student performance, motivation, and academic achievement (e.g., Beglau, 2005; Butzin, 2001; Page, 2002).

In a meta-analysis of studies that examined the effect of technology on student learning by Waxman, Lin, and Michko (2003), findings indicated a positive effect of instructional technology on teaching and learning. Waxman et al. noted, “the findings demonstrated that the overall effects of technology on student outcomes may be greater than previously thought” (p. 15).

The West Virginia Basic Skills Computer Education (WVBSCE) program became the subject of one of the first long-term statewide studies involving educational

technology and student performance. Commissioned by the Milken Family Foundation, an independent research team led by Dale Mann and Carol Shakeshaft from Columbia University studied the effectiveness of the state's 10-year educational technology program. The WVBSCE program placed computers in every kindergarten through sixth grade classroom through the state of West Virginia, and implemented a technology-enriched instructional program from 1991 through 1998. The researchers cited a direct correlation between student achievement gains and technology integration. Significant gains in mathematics, reading, and language arts skills were cited as results of the effective use of technology (Mann, Shakeshaft, Becker, & Kottkamp, 1999).

In the state of Missouri, the e-Mints program (enhancing Missouri's Instructional Networked Teaching Strategies) was studied and found effective in improving student learning outcomes. The e-Mints program is a collaborative educational initiative, sponsored by the Missouri Department of Education, which infuses modern and emerging technologies into classrooms while providing ongoing professional development for teachers in e-Mints classrooms. Beglau (2005) reported that technology infusion had significantly increased student performance on state standardized tests for low-income students and special education students. Improvements were noted in all subject areas by as much as 12 to 13 percentage points in comparing the e-Mints treatment group with the control group.

The extent to which educational technology impacts student learning remains dependent primarily on the nation's teaching force. There is an increasing body of credible research that suggests the single, greatest element to a child's academic achievement is the quality of the teacher (American Council on Education, 1999;

National Commission on Teaching and America's Future, 1996). Prichard (2004) suggested that the debate over educational technology should not focus on the actual technology, itself; but rather how teachers are using the technology. Prichard asserted the following:

You see, it's never been about the technology. The common claim that technology improves student learning and raises achievement scores is a fallacy. Think about it: Overhead and filmstrip projectors are forms of technology. But we don't claim these technologies engage students' interest, motivate learning, or enhance classroom interaction. What matters is how teachers use these technologies. An overhead projector is a versatile tool but requires effective application: How it is used is more important than what it is. And that's why teaching matters.

Effective teachers have shown gains in student learning through the integration of technology, not because of the number of computers in their classroom, but because they know how to engage students in the learning process (Prichard, 2004).

The CEO Forum on Education and Technology (1999) in its report entitled, *Professional Development: A Link to Better Learning*, outlined the five stages of teacher technology adoption. The first stage is referred to as the entry stage. It was noted that at the entry stage teachers began to learn how to use technology, as they were not themselves comfortable with technology. Students were able to use technology while a teacher was in the entry stage because an outside source was driving the technology usage - a computer lab teacher, for example. Next, in the adoption stage, teachers began to use technology as a productivity tool to replace some of the routine tasks found in a classroom. Teachers used technology in a limited manner, but saw the benefits

technology has to offer. As teachers moved into the third stage, adaptation, they began using technology with students. Technology became tied to the curriculum and learning objectives in the classroom. In the fourth stage, appropriation, teachers began to use technology as a powerful learning and teaching tool. They started planning lessons that would capitalize on the power of technology for increasing higher order thinking skills. Students saw technology as a learning tool in classrooms where the teacher was in the appropriation stage. Lastly, the invention stage was the final stage of teacher technology adoption noted by the CEO Forum. In the invention stage, teachers were transforming the traditional classroom environment to embed technology throughout the course of daily instruction. An understanding of the stages of teacher technology adoption can be valuable as professional development training is designed. The CEO Forum (1999) noted that tailoring technology training sessions to teachers needs could help schools make certain that technology is an effective tool for creativity, collaboration, and invention.

The George Lucas Educational Foundation has cataloged more than 150 online documentaries of case studies where technology has been utilized to enrich and improve student learning. In the Foundation's book, *Live and Learn*, stories from across the nation were compiled to demonstrate how teachers and technology are dramatically improving traditional schooling (Burness, Snider, Kirby, Duckett, Hartford, & Chion-Kinney, 1997). After studying and interviewing hundreds of teachers, administrators, and students, patterns of successful attempts to reform the educational process emerged. These included the seamless integration of educational technology. The editors stated the following:

Interactive multimedia technologies that incorporate audio, video, and graphics engage students' interests and open additional avenues for them to express their ideas and demonstrate what they have learned. The schools that have the freedom to set and pursue their own visions are finding that technology offers powerful tools to help translate their ideas into reality. (p. 6)

Granger, Morbey, Lothington, Owston, and Wideman (2002) conducted a multi-case study analysis from interviews conducted at four Canadian schools. Findings suggested that a culture of support and ongoing learning, collegial relationships among teachers, sound instructional pedagogy in the integration of technology, and principal support were observed as the most influential factors in the facilitation of technology-related professional development and classroom practice. Granger et al. noted that school culture and teachers' philosophical beliefs about quality teaching possibly constituted the most significant component of successful integration of technology.

Angers (2004) conducted an ethnographic study of three middle school teachers who utilize technology in instruction. Findings showed that the participating teachers believed technology was a tool that supported improved student learning outcomes. Teachers' personal beliefs about the role of technology helped to shape their goals for technology use. The study also reported that student motivation and satisfaction increased with the use of technology.

Classroom environments designed to encourage interaction, communication, and cooperation have proven more conducive to promoting increased student learning through technology integration. Technology-enriched classrooms can provide avenues for students to engage, solve problems, make decisions, and explore intriguing questions

(McKenzie, 2000). Technology-enriched classrooms have a “critical mass” of modern, strategically placed computers and adequate support for technology use.

Page (2002) studied elementary students in technology-enriched classrooms and students in traditional classrooms, and compared their development in the areas of student achievement, self-esteem, and classroom interaction. The findings indicated that children in technology-enriched environments scored higher on standardized achievement tests, demonstrated higher levels of self-esteem, and worked more frequently in student-centered environments.

Butzin (2001) conducted a three-year, experimental study involving two elementary schools. The treatment group experienced a transformed learning environment embedded with a technology-rich instructional model. The control group experienced a traditional, elementary classroom learning environment without the infusion of technology. The results demonstrated that technology had a significant positive effect on student learning. Additionally, the findings suggested that technology can be more effective when utilized in a transformed learning environment, than in a traditional setting.

### *Summary of the Literature Review*

Three topics have been included in this review of literature: (a) barriers to technology integration, (b) policy on educational technology, and (c) improving student achievement through technology. A wealth of information has been generated regarding the prevalence of technology in education in the past 20 years. The most noted barriers to technology integration include lack of professional development, lack of access to equipment, lack of support, and lack of time. These barriers create sizable obstacles for

teachers as they attempt to integrate technology into instruction. Recommendations have provided educators with strategies to effectively minimize the effects of these barriers.

National reports and federal policy have noted the importance of integrating educational technology into classroom teaching and learning. Additionally, studies have emphasized the need for improving access, creating quality educational content and software, providing teachers with high quality professional development, and most recently utilizing digital, online learning environments. Through these action steps, educational policymakers and researchers believe that student achievement will be improved. A growing body of empirical evidence has shown that the integration of technology has significantly improved student performance, motivation, and academic achievement.

### **Statement of the Purpose**

Teachers are to ensure that students have the necessary skills to thrive in the digital age. After years of significant investments in infrastructure and hardware, the promise of technology in education has yet to be fully realized. Policymakers and educational leaders are demanding evidence that these investments are improving student learning and teacher effectiveness. Further investments will hinge on these findings. Research is needed to determine the efficacy of technology in improving instruction and student achievement. The purpose of this study was to determine how an exemplary elementary teacher uses technology to improve student learning and why she has chosen to integrate technology into her classroom instruction in the ways she has.

### **Justification for the Study**

While most teachers recognize that computer technology is important, many do not have a clear understanding of how to effectively integrate it into classroom instruction to improve student learning. Results of this study may assist educational administrators and teachers in increasing student achievement through implementing effective technology integration strategies.

This research is also timely. The *No Child Left Behind Act of 2001* (2002) highlighted the need for additional research on the use of technology in teaching practice and the impact of technology on student learning. Very little empirical research exists that connects increased student academic achievement to increased technology integration and usage (Culp et al., 2003). Additionally, research suggests that the debate over educational technology should not focus on the actual technology, itself; but rather how teachers are using the technology (Prichard, 2004). Further study is also needed to determine what techniques teachers employ to effectively integrate technology into teaching. This study seeks to add to the existing literature regarding how and why exemplary teachers utilize technology in the classroom.

### **Questions to be Answered**

The following research questions were used to direct the focus of this study:

1. How does an exemplary elementary teacher use technology to improve student learning?
2. Why has she chosen to integrate technology into her classroom instruction in the ways she has?

## CHAPTER II

### METHOD

#### **Research Design**

This case study describes how technology was integrated in the classroom of an exemplary elementary teacher and why it was integrated in that way. Yin (2003) contended that a case study format was the preferred method for investigating contemporary events when "how" or "why" questions are being presented. Merriam (1988) stated that the case study is differentiated from other research designs because it seeks holistic description and explanation.

A case study offers a close examination of one incident of interest in a common, though possibly complex situation. Merriam (1988) stated, "by concentrating on a single phenomenon or entity, this approach aims to uncover the interaction of significant factors characteristic of the phenomenon" (p. 10). When conducting a case study, the researcher seeks to gain a complete picture of the case.

A holistic description of the events, actions, and routines that occur naturally in the case being studied is needed for the researcher to formulate accurate theories (Yin, 2003). Thick, rich descriptions of the case are useful in establishing credibility. In this study, an in-depth study of this single-case was required to properly understand the phenomenon. The case study design was selected for this study, as it would be impossible

for the researcher to separate factors or variables from the context of the classroom environment.

### **The Researcher**

According to Merriam (1988), the researcher is the primary instrument in case study research for data collection and for analysis. In case-study research, it is necessary for the researcher to have ongoing and close contact with the participants. Case study research requires the researcher to become a part of the world of the participant to see the environment from the participant's perspective. During the study, I was present at the school and in the exemplary teacher's classroom on a regular basis to observe and collect data.

During my professional career, I have worked as an elementary classroom teacher, school district technology coordinator, university adjunct instructor, and state director of educational technology (see resume in Appendix B). As a classroom teacher, I taught elementary grades in affluent, as well as poverty-stricken schools. In each setting however, technology was available at the classroom level. Training and support for technology were also readily accessible. In my elementary classroom, students used technology daily to augment the learning process. I was teaching at Rankin Elementary School in 1994 when it became the first school in Mississippi to have an Internet connection in every classroom. My teaching experiences were highlighted by special projects that involved technology, as well as utilizing a multiage classroom structure and inclusion model for students with special needs.

While my experience with educational technology began as a classroom teacher, it was enhanced through graduate studies. In 1997, I completed my master's degree in

instructional technology at Mississippi State University. Since that time, I have worked on several state and national committees and advisory boards. In addition, I was able to teach preservice elementary education students at Mississippi State University in both technology and elementary methods courses. In 2001, I worked at the Mississippi Department of Education as the state director of educational technology. This position provided opportunities to visit nearly every school district in Mississippi observing classroom teachers and technology coordinators as they implemented technology integration efforts. As the state director of educational technology, I discussed with educational administrators and policymakers the value of the classroom teacher in the technology integration process.

### **Research Participant**

Purposeful sampling was used for this study. Maxwell (1996) suggested the use of purposeful sampling when persons are "selected deliberately in order to provide important information that [cannot] be gotten as well from other choices" (p. 70). In combination with purposeful sampling, I used reputational-case selection to determine the participating teacher for this case study. In reputational-case selection, participants are "chosen on the recommendation of an 'expert' or 'key informant'" (Goetz & LeCompte, 1984, p. 82). I relied on direction from district administrators in choosing the participating teacher because they have had first-hand knowledge of the teacher's classroom instruction and her success with students.

The participant in this research study was a certified elementary teacher. Her elementary principal and a school district administrator were interviewed to provide additional perspectives to the case study. The participating teacher worked in Orderton

City Elementary School (a pseudonym) where she taught fourth grade. Courtney (a pseudonym) had been teaching for seven years. She was chosen for this study because of her reputation as an exemplary teacher who utilizes technology and because of her student's success in writing, as documented by the results of the Mississippi Writing Test administered to fourth graders.

Courtney's elementary principal and a school district administrator were interviewed in an effort to ascertain how school and district leadership decisions have influenced technology integration in Courtney's classroom. The participating elementary principal has been an administrator for 10 years. She has served as the elementary principal in the school where the participating teacher works for four years. The district administrator who is participating in this study serves as the director of instruction in the school district where the research was conducted. She has been a teacher, school administrator, and district administrator for 27 years.

### **Procedure**

To conduct this case study, I utilized several data collection techniques. Prior to any data collection, the participating school district superintendent granted permission in writing for me to conduct research in the school district. In addition, the Institution Review Board for the Protection of Human Subjects (IRB) of Mississippi State University approved my application for this study to be conducted (see Appendix C). Upon IRB approval, consent was obtained from Courtney and the administrators.

This study sought to uncover how an exemplary elementary teacher integrates technology into her daily instruction and why she chooses to do so. Personal interviews, observations, and document analysis were used to collect data.

I conducted an initial interview with the participating teacher. During this interview, an interview protocol was used as a framework for guiding questions (see Appendix D). Five additional interviews were conducted with the participating teacher to gather specific information related to her classroom instruction and technology integration decisions. Additionally, I conducted an interview with the participating teacher's elementary principal (see Appendix D). The purpose of this interview was to gather insights from the principal as to if and how the participating teacher has affected technology integration efforts among other teachers. Additionally, I sought information on how the technology usage of the participating teacher has affected student performance. An additional follow-up interview was needed to clarify questions that arose during my conversations with the participating teacher. I also conducted an interview with a district administrator who has knowledge of the participating teacher's technology usage. This interview focused on how the district has supported technology integration, and how the district has analyzed the success of the participating teacher's student achievement scores. In all, I conducted nine interviews to obtain varying perspectives on the participating teacher's level of technology integration and its impact on student performance.

All interviews with the participating teacher, school principal, and district administrator were recorded and transcribed. As the interview was being transcribed, the data were numbered by page and line for reference. Reactions and comments were also recorded with each transcribed interview to assist in formulating conclusions. This transcription was printed and also saved onto both a computer hard drive and networked server. Backup copies of all transcribed interviews were burned onto CD. Once each

interview was transcribed, I reviewed the complete transcript to check for clarity and identify topics that needed to be probed further in additional interviews.

Multiple observations of the participating teacher were conducted in her classroom and school setting (see Appendix D). I observed the participating teacher in the delivery of instruction on 26 separate occasions. Each observation lasted approximately one hour. Observations were scheduled in advance and at varied times to capture a range of activities and content instruction. Five observations were videotaped.

At the conclusion of these videotaped observations, a post-observation interview was conducted with the teacher. During these post-observation interviews, the videotape of the classroom observation was replayed for the participant. A discussion of the videotaped session served as the basis of the interview. The participating teacher was asked to reflect on her instructional strategies and share information that may lead to conclusions about such practice. During these interviews, the teacher was given opportunities to pause the recording and reflect or comment on any significant event. These interviews offered the opportunity to probe further into an issue, often with one question creating the need for another. The opportunity to clear-up questions lead to a better understanding of the conditions that existed in the teacher's classroom that support technology integration.

As observations and interviews were conducted, I also gathered pertinent documents for review (see Appendix D). The process of document analysis was used to uncover additional details that are not gleaned through observations and interviews. Additionally, these artifacts presented the school's commitment to and awareness of technology integration. Sample teacher lesson plans, student work samples, writing

assessment rubrics, school and district technology plans, the participating teacher's professional teaching portfolio, and the district's professional development catalog were collected for review. Documents were gathered from the participating teacher, her principal, and the district administrator.

The process of interviews, observations, and document analysis were ongoing and interconnected. I began by conducting separate interviews of the participating teacher, then her principal, and the district administrator. Each interview was recorded and transcribed. As part of the interviews with the principal and district administrator, I collected the school and district technology plans and the professional development catalog for analysis. I then began the observations of the participating teacher in her classroom setting. Throughout the observation process, I collected documents for analysis. These documents included lesson plans, student work samples, writing assessment rubrics, teacher-created assignments, the participating teacher's professional teaching portfolio, school and district technology plans, and the district's professional development catalog. Additionally, on five occasions, post-observation interviews were conducted. During these post-observation interviews, the participating teacher and I viewed the videotaped classroom observation and discussed her choices of instructional strategies.

### **Analysis**

In qualitative research, data collection and analysis is an ongoing process; analysis is not reserved until the end of the research. Data analysis begins as the data is collected and continues through the writing of the research report (Merriam, 1988).

Data analysis was conducted according to methods described by Merriam (1988) and Yin (2003). Merriam (1988) explained, “data analysis is the process of making sense out of one’s data” (p. 127). She described a process of data analysis that included:

1. Reviewing all data collected, both topically and chronologically,
2. Creating an outline for sorting data,
3. Identifying units of information which are later sorted,
4. Developing categories of recurring patterns in the data,
5. Making inferences, and
6. Developing a theory.

Yin (2003) stated that “every case study should...strive to have a general analytic strategy – defining priorities for what to analyze and why” (p. 109). The process of data analysis that I used can be summarized into three activities initially discussed by Miles and Huberman (1994) as data reduction, data display, and conclusion drawing and verification. As interviews, observations, and document analysis were completed, I began the process of organizing the raw data into usable segments of information - identifying units for sorting as Merriam (1988) described in her process of data analysis. Next, data were arranged into categories for comparison and further examination. I used these categories to determine patterns and themes that may be present in the participating teacher's classroom instructional strategies. Finally, conclusions were developed and verified through further triangulation.

In order to validate findings from the data source, attempts were made to triangulate data. Merriam (2001) described triangulation as “using multiple investigators, multiple sources of data, or multiple methods to confirm the emerging findings” (p. 204).

The triangulation approach that was used in this study included multiple sources of data to enhance validity and reliability. Since data triangulation requires a researcher to use a variety of data sources, this study used observation data, interview data, and document data for analysis. Once these data were collected, I analyzed notes, transcripts, and documents to check for patterns and emerging themes.

A coding process was employed to assist in the data analysis process. Data from each participant was coded using key words in the margins of the completed transcripts. This process assisted in sorting the raw data into emerging themes. Once all observations and interviews had been recorded, the field notes and transcripts were thoroughly read. Next, the data were analyzed for content and theme categorization. Topics and themes were identified from the research questions and from the data itself as it was analyzed. Themes were listed on a chart in matrix form. As categories emerge, they were assigned a color code that was kept as a list for easy reference. The color-coding system was also used to relate themes present in documents, field notes, research articles, and artifacts.

## CHAPTER III

### FINDINGS AND DISCUSSION

The purpose of this study was to determine how an exemplary elementary teacher uses technology to improve student learning and why she has chosen to integrate technology into her classroom instruction in the ways she has. The focus of the study was Courtney, an exemplary fourth grade teacher at an elementary school in Central Mississippi who integrated technology into her classroom. Courtney was entering her seventh year as a teacher, with all of her professional teaching experience having been in fourth grade at the same school. Her elementary principal and a school district administrator were also interviewed to provide additional perspectives to the study. The case study that resulted is presented in this chapter.

Data generated from interview transcripts, observations, and document analysis was grouped into emerging themes as they related to two guiding research questions.

1. How does an exemplary elementary teacher use technology to improve student learning?
2. Why has she chosen to integrate technology into her classroom instruction in the ways she has?

### **Orderton City Elementary School**

The recently constructed Orderton City Elementary School sits approximately 500 yards off of a busy county highway, surrounded by a beautiful natural landscape. The grounds were immaculate, the hallways sparkled, the paint appeared fresh, and the overall environment was very inviting. I made my way to the administrative office where I was greeted by the receptionist who assisted me in signing in and questioned me regarding my destination. After I explained my purpose for the visit, she directed me to Courtney's classroom down the hallway on the left.

As I walked down the hallway, I became more impressed by the building's design and later learned that the school won national recognition for new facility construction. Orderton City Elementary School serves students in kindergarten through fifth grades and was opened in August 2004. Orderton City Elementary was built as a result of a school attendance area rezoning plan and passage of a nearly \$70 million school bond issue. Prior to August 2004, the faculty, staff, administration, and students of Orderton City Elementary were housed at another school, Smith Street Elementary, which was reconstituted and the building was annexed by the local high school through the rezoning plan. Once the new elementary facility was built, it was renamed Orderton City Elementary to reflect its new location, which is on Orderton Drive.

According to the Mississippi Department of Education (2005), approximately 13% of the students at Orderton City Elementary received free or reduced lunches, which indicated that a relatively small portion of the students lived at or below the poverty level. Orderton City Elementary received the highest accreditation level (Level 5 Superior-Performing) from the Mississippi Department of Education in the fall of 2005. According

to the 2005 spring test administration of the Mississippi Curriculum Test, the students at Orderton City Elementary performed above the Mississippi state average in grades two through five in reading, language arts, and mathematics.

The school building consisted of 32 classrooms, a computer lab, indoor physical education facility, music and art classes, and large combination cafeteria/auditorium. Each grade level was designed in a hub formation with four classrooms positioned around a central meeting area. The hallways were covered with displays of student work – artwork, writing samples, graphic organizers, charts and graphs. In addition, large canvas murals, which were painted by students, were hung throughout the building.

As I walked toward the fourth grade hub of classrooms, I saw the computer lab on the left. The lab has 20 desktop Gateway computers, arranged on long tables running along the east and west walls of the room. At the back end of the lab was a wall with built-in cabinets, two sinks, and two floor-to-ceiling windows. The front wall of the classroom was fashioned with a long dry erase board and a table that houses a large, networked laser printer. Additionally, a wireless computer lab cart with 10 Apple laptops, and a printer, a scanner, and a digital camera was placed near the front of the room. In one corner of the room, an LCD projector connected to a teacher workstation computer, was positioned to display information onto a large screen. A computer lab schedule was posted on the back of the door. I noticed that Courtney's class had student work samples displayed on the bulletin board that was mounted to a wall above the computers.

I later learned the administrators at Orderton City Elementary have used local and federal funds, private donations, and grant resources to purchase computers and technology equipment. Every classroom had at least three computers, in addition to the

computers located in the lab. Technology was important to both the faculty and parents of Orderton City Elementary as evidenced by the financial commitment that had been made to purchase equipment.

### **Courtney's Classroom**

After I left the computer lab, I walked into Courtney's fourth grade classroom. The door to the classroom was covered in student work samples of creative writing assignments. Courtney explained to the students that I was a colleague who would be spending time in their classroom. The classroom was more rectangular in shape than I had expected. The teacher's desk was placed in the rear of the classroom, flanked by two large windows that overlooked the visitor parking area. As I made my way to the back of the classroom and sat at a small round table, I noticed that student desks were arranged in four groups with six desks in each group. The desks were designed with flat, simulated wood surfaces and an opening in the front, near where the student sat, for storage of notebooks and supplies. The navy chairs were not connected to the desks, allowing for flexible student grouping.

The 9 boys and 12 girls appeared to be paying close attention to the teacher's instruction. As I sat near the back of the classroom, I noticed the walls were almost completely covered with either student work or teacher-made charts. Hanging on the wall to my left was a large circle map, a graphic organizer, written on bright blue bulletin board paper. In the center of the circle was written the words "Hurricane Katrina" and along the outside of the circle were a variety of words and phrases related to the hurricane. On the bottom portion of the chart, students had written statements about Hurricane Katrina.

As I visually circled the classroom, I noticed a bulletin board that displayed tips on successful writing. Students had listed a variety of vocabulary words and classified them under the headings of verbs, adjectives, and adverbs. The classroom had two long dry erase boards – one mounted along the north wall and one mounted along the east wall. Each board was covered with assignments, daily schedules, homework reminders, and other various important notations. On the board in the front of the room, the teacher had written the “Quote of the Week,” by Frank Lloyd Wright which read, “I know the price of success – dedication, hard work, and an unremitting devotion to the things you want to see happen.” In addition, reminders for the teacher were written on the board. They included “install program in lab” and “don’t forget computer lab typing test.” Next to the dry erase board was a sizeable pocket chart with the title “Vocabulary from *Charlotte’s Web*.” The pocket chart displayed 34 vocabulary words typed onto pieces of paper the size of an index card, some of which included “miserable, scheming, lacerated, vaguely, and radiant.”

In the northeast corner of the classroom was a technology station. Two Gateway computers were positioned on an oddly shaped table. A laser printer and scanner were also located at this technology station. Above the computers, a 19-inch television was mounted to the ceiling and connected to one of the computers for classroom viewing. The television displayed notes on vocabulary words from chapters 16-17 of *Charlotte’s Web*. It read “*Charlotte’s Web* Vocabulary, Chapters 16-17 – lacerated: to tear roughly (verb).”

Along the south wall of the classroom were storage cabinets and shelves. In the northwest corner of the classroom was a reading area, outfitted with a rug, bookshelves, beanbags, and hundreds of books. At the rear of the classroom, near the teacher’s desk,

were a computer and printer that were used as a teacher workstation. Along the south wall of the classroom were storage cabinets and shelves.

### **Courtney**

Courtney is a 30 year-old white female who is beginning her seventh year as an elementary teacher. She grew up in a small town in rural East Mississippi, about 100 miles from where she currently works. She was influenced to become a teacher by her close family, where her father was a businessman and her mother worked as an assistant teacher. She has an older brother who is also a businessman. She has a vibrant personality, is very goal-oriented, and has high expectations of herself and her students. She recently ran a marathon simply because she had set that as a personal goal to accomplish before her 30th birthday.

In 1996, Courtney graduated from a local community college with an associate's degree in elementary education. She then attended Mississippi State University where she graduated in December 1998 with a bachelor's of science degree in elementary education. Upon completion of her student teaching, she enrolled in graduate school at Mississippi State majoring in instructional technology in January 1999. During her graduate studies, she worked as a graduate assistant in the educational technology department during the spring and summer semesters of 1999. She accepted a teaching position in May 1999 to begin teaching in August 1999 at Smith Street Elementary School, which was later renamed Orderton City Elementary School. As a first-year teacher, Courtney continued her graduate studies while teaching full-time by attending night courses and summer school. In August 2000, Courtney was awarded the master's of science degree in instructional technology.

Courtney's teaching experience was exclusively in elementary. She has taught self-contained fourth grade since 1999. The elementary school has had two principals since Courtney began her teaching career - Dr. Black, who hired her in 1999 and later retired in 2002, and Mrs. Jones, who is her current principal. In May 2003, Courtney obtained National Board Certification through the National Board for Professional Teaching Standards.

Throughout her preservice education program, Courtney felt frustrated that she was not given more time in a "real world setting" - an elementary classroom before her senior year. She recalled that very little technology, if any, was incorporated by her teacher education faculty. Additionally, there was no introduction to educational software that is typically found in elementary classrooms. She recounted that the university experience seemed very removed from actual classrooms. While she did recall the requirement of one computer course during her undergraduate coursework, she explained that the content of the course was not related to classroom teaching in any way.

Courtney did not have an overall positive experience during her student teaching experience. She recalled having a split semester assignment, spending the first half of the semester in a fourth grade classroom and the second half of the semester in a first grade classroom. The latter assignment was generally more positive than the first, even though she did not particularly enjoy teaching first grade. She did not consider either of her supervising teachers as models for quality instruction. Courtney described her student teaching as "not a good experience."

Courtney's experience with the supervising teacher in fourth grade was very disheartening. The teacher used only worksheets and the textbook for instruction and

"she actually told me that she hated it when I taught using centers!" This teacher was a veteran teacher and used the same lesson plans and activities year after year. Her experience with the supervising teacher in first grade improved, but not significantly. Due to the nature of a first grade classroom, Courtney was able to utilize centers and more hands-on instruction. However, Courtney did not feel compelled to teach lower elementary students. She did not feel that she gained anything from the first grade placement that she utilizes in her own classroom. Technology was not used at all in either student teaching placement. Additionally, effective classroom management and discipline strategies were lacking in both student teaching placements. She recalled, "When the supervising teacher left the classroom, I got harder on the students. I expected more of them than she did."

Courtney was encouraged by her family and a close friend of her mother's, who was an outstanding elementary teacher, to pursue a master's degree upon completion of her undergraduate study. Her mother's friend suggested that Courtney consider obtaining a master's degree in an area other than elementary education, as that would provide her with more varied experiences and options once she started her teaching career. Courtney had a personal interest in learning to use technology more readily, and chose to enroll in the instructional technology master's program. In the spring and summer semesters of 1999, Courtney worked as a graduate teaching assistant in the Department of Technology and Education. As a graduate assistant, she taught an introductory computer course to undergraduate students.

She felt the master's degree program in instructional technology did sufficiently prepare her to use various technologies. However, she recalled that the program was not

focused in any significant way on practical, classroom instructional strategies for technology integration. A majority of her graduate coursework revolved around more industrial and mechanical aspects of computers - how to design a computer lab, how to network a building for Internet access, and how to create a web page. She recalled that much of her beliefs regarding integrating technology into instruction developed from her own personal reading and philosophical conversations outside of class with professors, co-workers, and other graduate students.

While Courtney was disappointed that the graduate coursework did not have more direct connections to the elementary classroom, she did become proficient with a variety of technologies. She learned to use a digital camera, a digital video camera, a scanner, and a plethora of software that would be helpful in her personal and professional life. She attributed some of her ability to integrate technology into classroom instruction to the fact that she uses a great deal of technology in her personal life, which was accelerated by her graduate school preparation.

Courtney began her teaching career in August 1999. She was hired to teach fourth grade in May 1999, and recalled that much of her interview with Dr. Black involved a discussion about educational technology. According to the district administrator, in her first year as a teacher Courtney was quickly identified by Dr. Black, her principal, as a teacher with experience integrating technology and leadership qualities uncommon to most beginning teachers. She was also assigned the task of developing lesson plans and activities for teachers to use in the computer lab. Dr. Black asked Courtney to develop the school's web page and to share with other teachers how to create a classroom web page. In addition, her fellow teachers routinely came to her with questions and problems related

to technology integration. By the end of her first year as a teacher, Courtney had been deemed "technology guru" at the school.

Courtney has shared her knowledge of technology with other teachers. In interviews with both her principal and the district administrator, it was stated that Courtney's personality has allowed her to be well received by most of her teaching colleagues, even veteran teachers who might otherwise feel threatened. In the second year as a teacher, Dr. Black asked Courtney to develop quick, ten-minute "technology tips" to share with other teachers at each of the faculty meetings. Courtney developed these brief how-to lessons on a variety of topics including how to use the scanner, how to use the digital camera, how to copy images off the Internet, and so forth. She shared them during designated time periods at faculty meetings, but she also made handouts available for each teacher and placed a notebook of "how-to" sheets she created in the computer lab. Eventually, Dr. Black asked Courtney to present two lengthy training sessions for the entire school faculty, and recommended to other school principals that she conduct training sessions for their faculties as well.

Courtney has participated in numerous professional development activities, workshops, and conferences throughout her teaching career. She attended several workshops geared toward assisting teachers with integrating computers into their classroom instruction. However, the most noteworthy professional development experience she had was attending the Mississippi Educational Computing Association (MECA) annual state conference. While attending the MECA conference as a graduate student, Courtney was introduced to an assortment of new technologies, teaching strategies, and colleagues. Upon her second year of attending the conference and as a

first-year teacher, Courtney led a conference session that taught other educators how to use a piece of equipment called an Aver Key to connect a computer to a classroom television. Courtney recalled that the projector in the workshop location failed to operate properly, and she had to improvise. At the time she said this caused embarrassment and frustration. Later, however, she reflected that this experience prepared her for understanding how a workshop can be successful if the message is clear, even when the technology fails.

Since becoming a teacher at Orderton City Elementary, Courtney has participated in countless workshops and training sessions. As a teacher at Orderton City Elementary School, she has taught eight workshops or training sessions on a variety of topics related to classroom technology integration. The workshops she has taught in the school district range from web page design to specific instructional software applications to utilization of emerging technologies. Courtney has also taught technology workshops through a local community college, an educational service center in East Mississippi, and the Mississippi Department of Education. She has completed the comprehensive suite of professional development modules offered by the Mississippi Department of Education which focus specifically on educational technology. Federal mandates found in *No Child Left Behind* (2002) stated that all teachers must demonstrate technology proficiency prior to 2008. The Mississippi State Board of Education adopted the Mississippi Technology Standards for Teachers to identify what Mississippi teachers need to be able to know and do with technology in order to demonstrate proficiency. Three professional development modules were established by the Mississippi Department of Education to assist teachers in meet the new technology proficiency standards. Through the completion of these

modules, Courtney has documented her proficiency in the Mississippi Technology Standards for Teachers.

As she has progressed in her teaching experience, Courtney has continued to offer support to the teachers in her building, as well as others in the school district. The school district technology coordinator has asked Courtney to lead several workshops each summer for teachers on how to integrate technology into classroom instruction. Additionally, Courtney has also been asked to lead workshops for new teachers on technology usage as part of the district's teacher induction program.

### **How Technology Was Used in Courtney's Classroom**

Courtney used technology daily in her fourth grade classroom and in the computer lab to support instruction. Through this study, it was determined that Courtney used technology in three major ways. Those three ways were: (a) as a productivity tool for the teacher, (b) as a learning tool for the students, and (c) as a communication tool for parents and fellow teachers. These three ways are discussed in the following paragraphs.

Courtney's classroom was an active place where students were readily working collaboratively on projects and assignments. Throughout the school day, Courtney provided instruction using a variety of teaching strategies. Procedures were well established for every situation in Courtney's classroom. She explained that she spends the first two weeks of every school year modeling for students how to complete a variety of tasks. During this critical period, she does not spend much time on the fourth grade curriculum objectives. Rather, she felt it was more important for students to have a very clear understanding of how to function in her classroom: how to work in cooperative groups, how to demonstrate respect for the speaker, how to utilize a schedule for using

the computers in an equitable manner, how to organize their materials in the desk and in the classroom, how to use the reading area appropriately, and many other situational examples. The procedures were so well understood by students that Courtney would begin a request and the students would complete her sentence. The daily classroom procedures established during this crucial two-week period allowed Courtney to spend more time working with students individually, in part, because she was not constantly interrupted with extraneous questions from other students.

As Courtney taught each day, it was evident that technology integration was woven into every lesson either as a productivity tool for the teacher or as a learning tool for students. The use of technology was so transparent that when asked initially about her decisions to integrate technology in a certain lesson, Courtney was unclear regarding the question. After further discussion, Courtney revealed she was so accustomed to integrating technology as a tool that she was not even aware she had done so. That is, Courtney understands the use of technology to be an instructional strategy for enhancing learning, not the focus of a lesson in and of itself. She rarely spent time instructing students on actual computer skills. Most often, technology was used to supplement and improve student learning through research, organization, and delivery.

Technology was used most often in Courtney's classroom as a tool to assist her with instruction. In nearly every lesson, technology had been used in researching information, creating student activity sheets, or projecting information to the entire class. One computer in Courtney's classroom was connected to a mounted television set by a device called an Aver Key. The Aver Key allowed Courtney to present lessons one time to the entire class of students, rather than repeating the same lesson multiple times to

small groups of students. Additionally, Courtney used the Aver Key to discuss vocabulary terms, instructions, online information, instructional movie clips, and photographs. When asked about her reasoning for using the Aver Key so regularly, she noted that not all students can read her handwriting when she writes on the dry erase board at the front of the classroom. With the Aver Key, all students were able to clearly read the instructions. Courtney explained,

I've found that using the Aver Key adds excitement to learning. The students learn better when I present a new topic on the television screen. The bright colors draw their attention and keep them focused and interested. When introducing new skills to my students on using context clues, I noticed that I was losing their attention using a basic worksheet. I typed the lesson on my computer using various colors and graphics and displayed it on the television. The students stayed more actively engaged in the lesson and were able to master the concept faster.

Courtney also engaged the students by allowing them to select font type, size, and color when she typed instructions or class notes for students.

Courtney also planned instruction that provided opportunities for students to use technology daily. Because she believes so strongly in the value of integrating technology into the classroom, Courtney has implemented a schedule for introducing various technology skills to her students. The first nine weeks of school was spent learning correct typing skills in the computer lab. Because Courtney's class has 21 students and there are only 20 computers in the lab, she assigned a student to one of the laptop computers from the mobile cart to ensure that every student has access to an individual machine. Whenever the mobile laptop cart is being used in another teacher's classroom,

Courtney had to pair two students on one computer. Courtney also introduced basic software applications and computer-related tasks, such as formatting margins, inserting a text box, inserting a graphic, and saving a picture off the Internet. The students learned proper skills during the first months of school that allow projects to be completed using appropriate technology.

With each assignment Courtney gave to students, she provided explicitly clear directions. She not only explained what she expected students to be able to do; but she also gave examples for students of what not to do. Directions for students to use as a reference were written either on the dry erase board or on the television using the computer/Aver Key connection. Courtney also connected each assignment to an instructional objective by explaining the academic purpose of the lesson for students. She explained why the activity was important for students to understand and complete.

Technology was integrated in reading and science instruction in Courtney's classroom. During an interdisciplinary unit on *Charlotte's Web*, students used technology to create PowerPoint presentations after researching curriculum-related topics in science using the Internet. Working in cooperative groups, students researched information about vertebrates and invertebrates. Students were also assigned various types of spiders to research. Using graphic organizers, students represented their data on spiders, which was collected exclusively from the Internet. The computer lab and the computers in the classroom were used to complete the student projects. Courtney taught two mini-lessons to assist students with their presentations: how to insert a picture and how to change font style, size, and color. As groups of students needed assistance, Courtney provided support but most often asked probing questions to guide the students in the right direction. In one

particular case, Courtney taught a group how to delete a slide off the presentation. The overwhelming majority of her individual instruction was related to improving proper writing and research skills.

Students used the two computers in the classroom throughout the course of the day for reading and math practice. Reading comprehension skills were addressed daily using the Accelerated Reader program. Courtney used the Accelerated Math program as a tool for differentiated instruction, allowing students to progress individually through math skills. Courtney developed a flexible scheduling system that allowed students to reserve a computer in the classroom once they were close to completing an assignment. As computers were available, students were permitted to use them for individual instruction, enrichment, and remediation through software programs such as Accelerated Reader and Accelerated Math. Courtney was able to monitor student progress on the reading and math programs because both have an administrative management function, which logs individual student records. These records allowed Courtney to print out daily and weekly reports of student work. She shared these with students during individual conferences, sent them home weekly to parents, and provided copies of her class' progress to her principal.

Courtney maintained that technology was used to support and enhance student learning. Using the Accelerated Reader program, she documented remarkable progress in student reading levels. She shared one specific instance of a student who was reading at a 3.4 (fourth month of third grade) reading level at the beginning of school. The student had progressed to a 4.7 (seventh month of fourth grade) reading level in only a few short months of using the technology-enhanced reading program.

Technology has broadened the means of communication between Courtney and her students' families. Courtney has created a classroom web page that she updated on a daily basis. The web page contained information about classroom news, homework assignments, class schedule, special events, and photographs. Courtney explained that she communicated with parents almost daily due to technology. She conducted a survey at the beginning of the school year and learned that nearly all of her students' parents had access to electronic mail, either at home or at work. Parents contacted her daily regarding student progress or specific needs. On multiple occasions, a student shared with Courtney a question from their parent, and Courtney had already received the question via email and provided the parent with an answer. This increased parental involvement has improved student achievement, as parents are more informed about ways that they can assist their children at home.

In addition to increased communication with parents, technology has also improved collaboration between teachers. Using the network computer system, Courtney has provided every teacher in the school with access to lessons and activities that she created which integrate technology. She recounted that anytime she has found a new website that addresses a specific learning objective, or developed new instructional activities; she has been able to easily share that information with other teachers in her school. Courtney believed that technology has improved teacher cooperation because "collaborating through email is a daily occurrence" among teachers. With time a constant concern for most teachers, Courtney shared that teachers are able to share more information with each other through email in a more efficient manner. She also noted,

"using technology is the best way to share all of our lessons and ideas because we are so busy." With technology, teachers emailed instructional lessons at their convenience.

Courtney's interest in and effective use of technology has garnered her with special recognition from her principal and peers. She has been the school's webmaster since she started teaching in 1999. Over the years, other teachers have become interested in learning more about technology and have come to Courtney for assistance and advice. Courtney has encouraged several other teachers to attend formal workshops and training, while she also provided them with informal training and ongoing support at school. In particular, one teacher colleague was so interested in web page design that Courtney began sharing the responsibilities of webmaster with her.

To Courtney, her technology experience has been one of the most effective methods of improving student learning. Courtney explained that she felt the time she saved by using technology to plan and prepare lessons is now used for individual student assistance. She also felt that technology's engaging quality allowed her students to pay attention longer and provided for increased motivation, which "enhances my teaching and increases student learning."

### **Why She Has Chosen to Integrate Technology into Instruction**

Courtney had clear ideas and high expectations about how she wanted to integrate technology into her classroom instruction. She had a compelling vision of using technology in the elementary classroom to improve student learning. She integrated technology in her classroom in a number of ways. In studying why Courtney has chosen to integrate technology in the manner that she has, three factors were uncovered. Those three factors were: (a) administrative support, (b) personal technology usage, and (c)

student engagement and motivation. These factors are discussed in the following paragraphs.

Courtney's efforts to integrate technology into classroom instruction were strongly supported by her first principal, Dr. Black. Courtney expressed a strong belief that technology should not be used for technology's sake, but rather integrated into the curriculum objectives that students are required to master. She stated, "I'm not teaching technology. It's used as a tool to enhance the curriculum skills that I am already teaching that day - not just the technology skills." This strong philosophy for why she integrated technology into her teaching methodology was influenced by the support and encouragement of her first principal, Dr. Black, and her experiences with students.

In the early spring of 1999, Courtney began her attempts to secure an elementary teaching position. Through the recommendation of an acquaintance who worked for the school district, her search inevitably led her to Smith Street Elementary School (later renamed Orderton City Elementary after school district rezoning and the school bond issue passage) where she met Dr. Black, the principal. After a brief meeting, Dr. Black immediately offered Courtney a teaching position for the upcoming fall. Courtney asked for time to consider the offer. In May, she called Dr. Black and accepted the fourth grade teaching position.

Dr. Black, who is now retired, was a strong proponent of educational technology. She had developed a positive reputation among her fellow administrators throughout the school district as a leader in technology integration. According to the two administrators interviewed in this study, Dr. Black worked to remove the barrier of access to technology through grant writing and school fundraisers. She was able to secure classroom

computers and a 20-station computer lab through these additional funding sources. In addition, Dr. Black provided time for technology planning and required that each teacher include a technology-based activity in their weekly lesson plans. The additional barriers to technology integration of a lack of adequate professional development for teachers and support for technology usage were also addressed by Dr. Black. Each year the school district designated two days, one each semester, as professional development days. Students did not attend classes on these dates and teachers attended school-based workshops. Dr. Black designated both days each year to technology-related workshops and training sessions. She also worked to ensure that the district's technical staff handled teacher requests in an efficient manner, to reduce the amount of time a teacher had to wait on a computer to be repaired before using it again as part of classroom instruction.

Upon her initial employment, Courtney met with Dr. Black regarding the principal's expectations and vision for technology integration. While many strides had been made equipping the school with modern technology, Dr. Black was still concerned about the integration of technology into daily instruction. She spent many hours conversing with Courtney about instructional methods for using computers in the classroom, ideas for training other teachers, and ways to engage students in the learning process through technology use.

Over the course of her first year, Courtney was assigned with many additional responsibilities related to technology. In addition to appointing Courtney as the school's webmaster, Dr. Black also asked Courtney to serve as the lead teacher for planning technology integration lessons. Dr. Black's typical arrangement was that each teacher in a grade level would serve as the lead teacher of a content area - one lead teacher for

reading, one for math, etc. The school did not have a lead teacher for technology until Dr. Black asked Courtney to serve in this role. Courtney created a multitude of activities that she shared with all of the teachers in the building.

Previously, the elementary teachers in her school had very little experience with technology and they had not been shown how to effectively integrate computers into instruction. Most teachers who used computers in the classroom limited the technology to drill and practice style software games or something for students to do in their free time. Dr. Black expected that other teachers in the building would gradually integrate technology into their lessons after working with Courtney. The resistance from the fellow teachers decreased over time and their attitudes became more positive about technology integration. Courtney observed, “They (fellow teachers) resisted it (technology integration) heavily in the beginning because it was new. Now you don’t hear one complaint because they are used to it and they've had lots of training.”

In addition to supporting Courtney's role as a teacher leader, Dr. Black also encouraged Courtney to present professional development sessions at workshops and conferences. While working with Dr. Black, Courtney was persuaded to present at the Mississippi Educational Computing Association annual state conference several times. In addition to presentations at the state conference, Dr. Black recommended to other principals that Courtney should present to their faculties and staff. As a result, Courtney conducted workshops at two other schools in the district. With the encouragement and support of her principal, Courtney began teaching technology professional development courses at the district office during the summer and for a local community college. Dr. Black's influence served as a strong factor in why Courtney has continued to integrate

technology into her classroom instruction. Dr. Black believed that technology would improve student learning, and she believed in Courtney as a teacher. That faith has helped to shape Courtney into the exemplary teacher that she is today.

Repeatedly, Courtney shared that she integrates technology into her daily classroom instruction because she “wouldn’t know what to do without it.” In her personal life, Courtney is an avid technology user. Courtney expressed that since her first years in college she has learned to utilize computers to simplify routine tasks and accelerate difficult responsibilities. Courtney explained that she conducts her banking online, orders books and clothes online, uses word processing applications to create stationery for herself and reward certificates for her students, and communicates with family and friends through email almost daily.

Courtney relied on technology for a myriad of teacher duties, for example recorded student grades, prepared lesson activities, created tests and student work activity pages, designed classroom bulletin board charts, and communicated with parents and other teachers. Courtney used the computer to create nearly every assignment that was given to students. She stated that being able to save and revise documents has streamlined her planning process from week-to-week and year-to-year.

Courtney noted that as she has tried to assist fellow teachers with integrating technology, she has found that teachers who use technology in their personal life are much more open to integrating technology into their instruction. She shared a story of a specific teacher who does not have a computer at home or use one outside of the school day. This teacher has seemed willing to use technology in the classroom, but has relied greatly on Courtney to “hold her hand” through the process. Courtney strongly indicated

that she is proficient with technology integration in her classroom because she is a consumer of technology herself.

In addition, Courtney reported that one of the greatest factors in why she has chosen to integrate technology into instruction is student motivation. She shared that technology is a powerful student motivator. Courtney explained that by using technology she believes students' learning styles are also taken into account. She shared that each year students have demonstrated increased levels of engagement and excitement in her classroom when technology is in use, which served as a contributing factor in her instructional decision-making.

Parents have commented to Courtney and to her principal that their child seemed more interested in school and in learning than ever before while in her fourth grade classroom. Courtney explained that students have expressed pleasure over learning computer skills that will assist them throughout their life. Technology integration has provided opportunities for students to use a variety of equipment during the school day. Courtney believes that the integration of technology has added interest to the classroom routine, and increased student participation levels.

Courtney also noted, that because a majority of her technology integration activities required small group work, students have demonstrated improved cooperation and collaboration. As she plans instruction, Courtney includes multiple opportunities for students to work together. She has purposefully selected student arrangements that require a weaker student to work with a stronger student, or grouped students by interest levels. Throughout the school year, with virtually every new technology-related activity, these groups are reformed. This has provided students multiple opportunities to work

with every other student in the class. Through this dynamic grouping design, students have learned to work more closely and to value each other's contributions.

### **Discussion of Related Literature**

The purpose of this study was to determine how an exemplary elementary teacher uses technology to improve student learning and why she has chosen to integrate technology into her classroom instruction in the ways she has. The findings included three ways in which the participating teacher used technology in her classroom. They were: (a) as a productivity tool for the teacher, (b) as a learning tool for the students, and (c) as a communication tool with parents and fellow teachers. In studying why Courtney has chosen to integrate technology in the manner that she has, three factors emerged. Those three factors were: (a) administrative support, (b) personal technology usage, and (c) student engagement and motivation.

Courtney's use of technology as a productivity tool was discussed and documented. She depended upon technology to assist her with lesson planning, creation of student work activities, and management of student grades. The CEO Forum on Education and Technology (1999) noted the five stages of teacher technology adoption. In the adoption stage, it was noted that teachers began to use technology as a productivity tool to replace some of the routine tasks found in a classroom. Courtney has certainly progressed beyond the mere adoption of technology and into the adaptation and appropriation stages of technology integration. However, she has continued to utilize technology, when appropriate, to facilitate and manage the daily tasks of a classroom teacher.

In Courtney's classroom, technology was integrated in an assortment of ways to support student learning. Students utilized technology to improve reading and mathematics understanding through computer-assisted, individualized instruction. Technology was also utilized as a research tool to augment curriculum materials in the classroom. Mann, Shakeshaft, Becker, and Kottkamp (1999) studied the effectiveness of technology infusion in West Virginia over a ten-year period. Computers were placed in every kindergarten through sixth grade classroom and a technology-enriched instructional program was implemented. The researchers cited significant improvements in student reading and mathematics achievement as a result of increased technology integration. Beglau (2005) reported that technology infusion had significantly improved student learning outcomes on state standardized tests.

Technology was also used in Courtney's classroom as a communication tool with parents and other teachers. Courtney routinely emailed parents information regarding student performance and school news. Additionally, the classroom website kept parents informed of upcoming events, homework assignments, and curriculum content. Courtney communicated daily with other teachers in her school via technology. She shared lesson plans, instructional ideas and websites with fellow teachers to support technology integration throughout the school. The National Association of State Boards of Education (2001) affirmed in the report, *Any Time, Any Place, Any Path, Any Pace: Taking the Lead on e-Learning Policy*, that that digital learning environments can transform the teaching and learning landscape through increased communication, among other factors. The report noted that technology can help to eliminate the isolation of schools within communities through increased communication. Capitalizing on the power of technology

as a tool for increased communication will help redesign the traditional classroom learning environment.

The participating teacher was influenced to integrate technology into her classroom in the ways that she has, due in part, to administrative support. Courtney's first principal, Dr. Black, provided encouragement, support, and guidance to Courtney as she began integrating technology into her classroom. Through conversations with Dr. Black regarding the appropriate use of technology, Courtney developed lesson plans and activities that benefited student learning. With the encouragement of Dr. Black, she was given opportunities to further her own professional growth and train fellow teachers in technology integration. Granger et al. (2002) noted that school culture, administrative support, and teacher pedagogy were proven in the process of using technology to improve student learning outcomes. Findings suggested that a culture of support and ongoing learning, collegial relationships among teachers, sound instructional pedagogy in the integration of technology, and principal support were observed as the most influential factors in the facilitation of technology-related professional development and classroom practice.

Courtney's personal technology usage was also a contributing factor as to why she has chosen to integrate technology into her classroom. In her personal life, Courtney used technology to assist her with banking, shopping, and budgeting. In her classroom, Courtney used the computer to create nearly every assignment that was given to students. She stated that being able to save and revise documents has streamlined her planning process from week-to-week and year-to-year. She felt that because she was comfortable with using technology for personal tasks it was easier to apply technology in the

classroom. Angers (2004) found that teachers' personal beliefs have also proven to be a factor in increasing technology integration. Teachers' personal beliefs about the role of technology influenced classroom technology use.

Student engagement and motivation also served as factors to why Courtney has chosen to integrate technology into instruction. Courtney believed that technology was a compelling student motivator. Courtney attributed increased levels of engagement and excitement in her classroom to the use of technology. Page (2002) found improved student achievement among elementary students in technology-enriched classrooms as compared to students in traditional classrooms. The findings noted increases in the areas of student achievement, self-esteem, and classroom interaction. Angers (2004) also reported that student motivation and satisfaction increased with the use of technology among middle school students.

This study focused on how an exemplary elementary teacher used technology in her classroom and why she has chosen to integrate it in the ways that she has. The findings on how she used technology were categorized into three ways: (a) as a productivity tool for the teacher, (b) as a learning tool for the students, and (c) as a communication tool with parents and fellow teachers. Additionally, three factors emerged regarding why Courtney has chosen to integrate technology in the manner that she has. Those three contributing factors were: (a) administrative support, (b) personal technology usage, and (c) student engagement and motivation. All of the themes were present in the review of literature. Since teachers serve a critical role in improving student learning, understanding how an exemplary teacher uses technology effectively and what motivates her to do so is valuable to the process of advancing technology integration.

## CHAPTER IV

### SUMMARY, IMPLICATIONS, AND RECOMMENDATIONS

This chapter begins with a summary of the literature, the purpose of the study, the research design, and the case study. The chapter will also provide implications developed from the case study, and concludes with recommendations for practice and further research.

#### **Summary**

Research has proven that students benefit from technology integration. However, many teachers have found the infusion of technology into curriculum and instruction a complicated task (Cuban, 2001; U.S. Department of Education, 1996, 2000; Web-based Education Commission, 2000). National figures report that a significant number of teachers are not yet integrating technology into the classroom instruction (Education Week, 2005). Effective technology integration in the classroom is often hampered by barriers to technology use (Solomon & Schrum, 2002).

Research noted that even teachers with generally positive opinions of technology experience difficulty and barriers in the process of integrating educational technology. The most documented barriers to successful technology integration include lack of professional development, lack of access to equipment, lack of support, and lack of time (OTA, 1995). Studies have noted that these barriers must be addressed in order to

successfully incorporate technology into the teaching and learning process (Byrom, 1998; National Center for Education Statistics, 2000; OTA 1995).

A significant challenge in the technology integration process has been the inadequate professional development of teachers (CEO Forum on Education and Technology, 1999; National Center for Education Statistics, 2000). Teachers frequently feel unprepared using computers and are unaware of the instructional standards and content-based practices that modern technologies are able to support. National survey results declared that in almost 20% of schools over half of the teachers are technology "beginners" (Education Week, 2005). Limited access to technology equipment and connectivity has proven to be another substantial barrier to the effective integration of educational technology. School districts report that equipment upgrades, technical support, and training are capital expenses and are therefore ongoing costs (Dickard, 2003). The goal of effective technology integration is further complicated by a lack of adequate support. Research noted that very few schools have a full-time school level computer coordinator or technician (Ronkvist, Dexter, & Anderson, 2000). Like a many schools throughout the nation, Orderton City Elementary School did not have a full-time school level technology coordinator or technical support person. Orderton City Elementary School shared a technician with five other schools. Another barrier that can frustrate technology implementation efforts is the lack of time. The National Center for Education Statistics (2000) noted two types of time barriers: the lack of release time for teachers to learn how to integrate computers into instruction and the lack of time in the schedule for students to actually use technology in class. The lack of time is one major

reason a sizeable number of teachers report they do not utilize computers and other technologies regularly for instruction (Solomon & Schrum, 2002).

Studies have shown that the lack of professional development, access, support, and time can seriously hinder the integration of educational technology. However, schools using technology have noted that recognizing and working through the barriers to technology integration is an ongoing and complicated process, but one that is beneficial for student learning gains (Southern Region Education Board, 2005).

In the past 20 years, American schools have made considerable progress improving both their technological capacity and their capability to embed technology in the learning process (Culp et al., 2003; National Center for Education Statistics, 2005). These improvements are partially due to recommendations presented in numerous federal policy initiatives and national reports. Federal and state policy initiatives published in the past 15 years have primarily focused on the barriers to effective technology usage: access, time, training, and support. Policy documents and reports have spotlighted the need for improving access, creating quality educational content and software, providing teachers with high quality professional development, and most recently utilizing digital, online learning environments (Culp et al., 2003). An increasing consensus indicates that the focus of current research should shift from quantitative factors of access, training, support, and funding issues toward more qualitative factors of improving teacher instruction and student technology literacy (North Central Regional Education Laboratory, 2004).

Recently, technology literacy has been recognized as a fundamental skill for all students (International Society for Technology in Education, 2000). In addition, new

federal policies have targeted efforts on confirming that technology does improve student learning gains (No Child Left Behind, 2002). Key studies and publications have built the framework of research that technology integration has improved student performance, motivation, and academic achievement (e.g., Beglau, 2005; Butzin, 2001; & Page, 2002).

The degree to which technology improves student learning continues to be dependent largely on the nation's teaching force. There is an growing body of credible research that indicates the single, greatest factor in a student's academic success is the quality of the teacher (American Council on Education, 1999; National Commission on Teaching and America's Future, 1996). The debate over educational technology should not center on the actual technology, itself; but rather on how teachers use the technology (Prichard, 2004). Effective teachers have documented gains in student learning through technology integration not because of the number of computers in their classroom, but because they know how to engage students in the learning process.

Key issues of school culture, administrative support, and teacher pedagogy have been noted in the process of using technology to improve student learning outcomes. Granger et al. (2002) conducted a qualitative multi-case study analysis from interviews conducted at four Canadian schools. Findings suggested that a culture of support and ongoing learning, collegial relationships among teachers, sound instructional pedagogy in the integration of technology, and principal support were observed as the most influential factors in the facilitation of technology-related professional development and classroom practice.

While school culture and administrative support have shown to influence technology usage, teachers' personal beliefs have also proven to be a factor in increasing

technology integration. Angers (2004) conducted a qualitative study of three middle school teachers who integrate technology into instruction. Findings showed that the participating teachers believed technology was a tool that supported improved student learning outcomes. Teachers' personal beliefs about the role of technology influenced classroom technology use. The study also reported that student motivation and satisfaction increased with the use of technology.

Additionally, classroom environments designed to encourage interaction, communication, and cooperation have proven more conducive to encouraging student learning gains through technology integration. Page (2002) studied elementary students in technology-enriched classrooms and students in traditional classrooms and compared their development in the areas of student achievement, self-esteem, and classroom interaction. The findings indicated that children in technology-enriched environments performed better on standardized tests and had increased self-esteem.

This study was conducted to determine how an exemplary elementary teacher uses technology to improve student learning and why she has chosen to integrate technology into her classroom instruction in the ways she has. This research was performed to add to the existing literature on the techniques teachers employ to effectively integrate technology into instructional practice.

The research design used in this study was a single-case study. Data from interviews, observations, and document analysis were used to generate the findings of this study. As the researcher, I was the instrument used for the collection of data.

The participant in this research study was a fourth grade elementary teacher at Orderton City Elementary School in Central Mississippi. Her school principal and a

district administrator were also interviewed to provide additional perspectives to the case study. The study focused on the ways the participating teacher integrated technology into her instructional practice, and why she made the decisions to do so.

I interviewed the participating teacher regarding her classroom instruction and technology integration decisions. Additionally, I interviewed her school principal to determine how the participating teacher has affected technology integration efforts among other teachers. A district administrator was also interviewed to determine how the district has supported technology integration. I conducted multiple observations of the participating teacher in her classroom and school setting. Documents were collected from the classroom, school, and district office. I analyzed teacher lesson plans, classroom assignments, writing assessment rubrics, the participating teacher's professional teaching portfolio, the school and district technology plans, and the district's professional development catalog.

As part of the data analysis, the triangulation approach was used in this study to enhance validity and reliability. This study used observation data, interview data, and document analysis. Once these data were collected, I analyzed my field notes, transcripts of interviews, and documents to check for patterns and emerging themes. A coding process was used in the data analysis process. Data from each participant was coded using key words to sort the raw data into themes.

Orderton City Elementary, where the participating teacher is employed, serves students in kindergarten through fifth grades. Located on a grassy hill, the immaculate grounds complimented the newly constructed building, which was opened in August 2004. The school building facility consists of 32 classrooms, a computer lab, indoor

physical education facility, music and art classes, and large combination cafeteria/auditorium. In 2005, Orderton City Elementary was awarded a Level 5 Superior-Performing accreditation level, the highest accreditation level provided by the Mississippi Department of Education.

The fourth grade classroom was inviting and filled with evidence of student work. Rectangular in shape, the teacher's desk was near the back of the classroom, flanked by two large windows. Student desks were arranged in four groups with six desks in each group. With 21 students total, they were almost evenly distributed by gender. The classroom had two large dry erase boards, bulletin boards, pocket charts, bookcases, and storage areas. In the front of the room was a technology station with two computers, a printer, and a wall-mounted television set which was connected to one of the computers for projection. The rear of the classroom encompassed a reading area, outfitted with beanbags, a rug, and bookcases filled with hundreds of books. The classroom was a welcoming space where students stayed engaged and focused of learning.

The participating teacher, Courtney, is a 30 year-old white female who is beginning her seventh year as an elementary teacher. She has obtained an associate's degree in elementary education from a local community college, a bachelor's degree in elementary education from Mississippi State University, and a master's degree in instructional technology also from Mississippi State University. She has a vibrant personality, is very goal-oriented, and has high expectations of herself and her students. Courtney's teaching experience was exclusively in elementary. She has taught self-contained fourth grade since 1999 in the same elementary school in Central Mississippi.

In May 2003, Courtney obtained National Board Certification through the National Board for Professional Teaching Standards.

Throughout her preservice education program, Courtney felt frustrated that she was not given more time in an elementary classroom before her senior year. She recalled that very little technology, if any, was incorporated by her teacher education faculty. She recounted that the university experience seemed very removed from actual classrooms. Additionally, Courtney did not have an overall positive experience during her student teaching experience. She did not consider either of her supervising teachers as models for quality instruction.

Courtney has participated in numerous professional development activities, workshops, and conferences throughout her teaching career. In her first year as a teacher, Courtney was quickly identified by Dr. Black, her principal, as a teacher with an exceptional technology background and leadership qualities. Dr. Black encouraged Courtney to present technology lessons at faculty meetings, develop lesson plans for use in the computer lab, and develop the school's web page. As she has progressed in her teaching experience, Courtney has continued to offer support to the teachers in her building, as well as others in the school district.

The two research questions to be answered in this study were:

1. How does an exemplary elementary teacher use technology to improve student learning?
2. Why has she chosen to integrate technology into her classroom instruction in the ways she has?

The findings of this study included examples of how Courtney used technology in her classroom. These findings were categorized into three ways: (a) as a productivity tool for the teacher, (b) as a learning tool for the students, and (c) as a communication tool with parents and fellow teachers. I found that the participating teacher integrated technology into daily activities across a wide variety of curriculum content areas. She utilized technology in classroom and computer lab situations and designed authentic activities for students that were enhanced by the use of computers and the Internet. The classroom environment was designed to encourage interaction, communication, and cooperation as students worked on instructional activities that incorporated technology. The barriers of professional development, access, support, and time did not hamper the participating teacher's ability to integrate technology. Technology was used daily in her classroom for enhancing student work, easing the teacher's management and planning tasks, and communicating with parents and other faculty members.

Additionally, I found that the participating teacher was motivated to use technology by three factors. Those three contributing factors were: (a) administrative support, (b) personal technology usage, and (c) student engagement and motivation. As a new teacher, she experienced a significant amount of support and encouragement from her principal. This administrative support included release time for professional development, public recognition, and ongoing encouragement for professional growth. In addition, the participating teacher's personal use of technology has increased the level of technology integration in her classroom. The data also suggested that student engagement and motivation were significant factors as to why the participating teacher chooses to integrate technology into her daily classroom instruction.

## Implications

This study examined how an exemplary elementary teacher uses technology to improve student learning and why she has chosen to integrate technology into her classroom instruction in the ways she has. The seamless integration of technology into the teaching and learning process is essential for success in the 21<sup>st</sup> century classroom. However, many teachers have found the infusion of educational technology into curriculum and instruction a difficult task (Cuban, 2001; U.S. Department of Education, 1996, 2000; Web-based Education Commission, 2000). When a teacher who has effectively managed to integrate technology into her daily classroom practice shares how and why she has chosen to do so, the professional education community can make more informed decisions about ways to improve technology integration. Studies show that most teachers are not comfortable with integrating technology into their instructional practices in an effort to improve student learning (Feldman, 2001; National Center for Education Statistics, 2000). Prichard (2004) stated that the debate over educational technology should not focus on the actual technology, itself; but rather on how teachers use the technology. Effective teachers have improved student learning through technology integration not because of the number of computers in their classroom, but because they know how to engage students in the learning process. This research study could provide an increased understanding of how valuable the teacher's role is in successful integrating technology into the classroom. The implications of this study could enhance teacher education programs, educational administration programs, as well as professional development programs.

The participating teacher in this study repeatedly explained that her ability to integrate technology into the classroom was not influenced by her preservice teacher education experience. She felt frustrated that she was not given more time in an elementary classroom before her senior year. She recalled that very little technology was incorporated by her teacher education faculty and educational software typically found in most schools was not introduced. While she did recall the requirement for one computer course during her undergraduate coursework, she explained that the content of the course was not related to classroom teaching in any way. The participating teacher indicated that her ability to integrate technology into classroom instruction was influenced by her experiences in graduate school as she pursued a master's of science degree in instructional technology, not her preservice experiences. An implication from this study is that preservice teacher education programs should include technology integration throughout a variety of courses. Technology should be introduced to preservice teachers early and often.

The findings demonstrated that the participating teacher utilized technology in both classroom and computer lab situations and designed authentic activities for students that were enhanced by the use of computers and the Internet. The participating teacher created a classroom environment that encouraged interaction, communication, and cooperation among students as they worked on technology-enhanced instructional activities. Studies have proven that technology-enriched classrooms increase student achievement gains, student engagement, and self-esteem (McKenzie, 2000; Page, 2002). A variety of instructional strategies for integrating technology, which enhance student

interaction and communication, should be incorporated into the methods courses of preservice teacher education programs.

The results of this study also indicate that the participating teacher integrated technology into a variety of daily classroom activities. Technology was incorporated in her classroom for enhancing student work, easing the teacher's management and planning tasks, and communicating with parents and other faculty members. The barriers of professional development, access, support, and time did not hamper the participating teacher's ability to integrate technology. This is consistent with the recent literature that demonstrated how schools using technology have noted that working through the barriers to technology integration is an ongoing process, but one that is beneficial for student learning gains (Southern Region Education Board, 2005). This implies the necessity for educational administrators and school communities to develop creative solutions to address the most-noted barriers to technology integration.

Another implication from this study is that school principals need to be aware of the significant impact administrative support has on increasing technology integration. The participating teacher experienced a considerable amount of support and encouragement from her principal. This administrative support included release time for professional development, public recognition, and ongoing encouragement for professional growth. For teachers to experience success with technology, school leaders must demonstrate the importance and relevance of technology into the teaching and learning process. The findings of this study indicate that the level of administrative support served as a motivating factor for the participating teacher when deciding to integrate technology.

Professional development programs should incorporate ways to assist teachers with incorporating technology into their daily lives. The findings of this study show that the participating teacher's personal use of technology has increased the level of technology integration in her classroom. Training sessions that provide instruction on personal productivity technology skills, which the teacher will use on a routine basis, may prove more effective than traditional methods that are solely focused on educational software packages.

Teacher education programs and professional development programs should provide more instruction in the area of student engagement and motivation. The data from this study suggest that student engagement and motivation were significant factors as to why the participating teacher has chosen to integrate technology into her daily classroom instruction. The participating teacher reported that students expressed pleasure over learning skills on the computer that will assist them throughout their life. Additionally, the participating teacher reported that each year students have demonstrated increased levels of engagement and excitement in her classroom when technology is in use, which is a contributing factor in her instructional decision-making.

### **Recommendations**

The participating teacher in this study indicated a need for more exposure to technology in her preservice teacher education program. It is recommended that the teacher education faculty reevaluate the level of technology integration in courses offered throughout the education program. I recommend that educational technology be incorporated into a variety of undergraduate teacher education courses. Additionally, it is

recommended that a variety of instructional strategies for integrating technology be included into the methods courses of preservice teacher education programs.

Further study in how to effectively reduce the most-noted barriers to technology integration - lack of professional development, access, support, and time, is recommended. Technology was incorporated into the participating teacher's classroom for student instruction, management tasks, and communication. The barriers of professional development, access, support, and time did not hamper the participating teacher's ability to integrate technology. Educational administrators may benefit from an increased understanding of methods to use that will reduce these barriers and improve technology integration efforts.

It is recommended that educational administration graduate programs should require candidates to take an educational technology course. This course should incorporate the benefits of educational technology on student learning, methods for increasing technology integration, and strategies to promote technology use by faculty and staff. School principals need to be aware of the significant impact administrative support has on increasing technology integration, and the outcomes of technology on student achievement.

It is also recommended that further study be conducted to determine the link between the use of technology in a teacher's personal life and any increased classroom technology integration. The participating teacher in this study demonstrated high levels of technology use in both her personal and professional life. Professional development programs should incorporate ways to assist teachers with incorporating technology into their daily lives.

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APPENDIX A

EDUCATIONAL TECHNOLOGY POLICY DOCUMENTS

Figure 1

## Educational Technology Policy Documents

1983	<i>A Nation at Risk</i> National Commission on Excellence in Education
1988	<i>Power On! New Tools for Teaching and Learning</i> U.S. Congress, Office of Technology Assessment
1989	<i>Linking for Learning: A New Course for Education</i> U.S. Congress, Office of Technology Assessment
1992	<i>Testing in American Schools: Asking the Right Questions</i> U.S. Congress, Office of Technology Assessment
1993	<i>Adult Literacy and New Technologies: Tools for a Lifetime</i> U.S. Congress, Office of Technology Assessment
1995	<i>Connecting K-12 Schools to the Information Superhighway</i> McKinsey & Company  <i>Education and Technology: Future Visions</i> U.S. Congress, Office of Technology Assessment  <i>Teachers and Technology: Making the Connection</i> U.S. Congress, Office of Technology Assessment
1996	<i>The Learning Connection: Schools in the Information Age</i> The Benton Foundation <i>Getting America's Students Ready for the 21st Century: Meeting the Technology Literacy Challenge. A Report to the Nation on Technology and Education</i> U.S. Department of Education  <i>Kickstart Initiative: Connecting America's Communities to the Information Superhighway</i> National Information Infrastructure Advisory Council (NIIAC)
1997	<i>Computers and Classrooms: The Status of Technology in U.S. Schools</i> Educational Testing Service  <i>Overview of Technology and Education Reform</i> U.S. Department of Education

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*Report to the President on the Use of Technology to Strengthen K-12 Education in the United States*

President's Committee of Advisors on Science and Technology

*School Technology and Readiness Report: From Pillars to Progress*

The CEO Forum on Education and Technology on Education and Technology

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1999 *School Technology and Readiness Report. Professional Development: A Link to Better Learning*

The CEO Forum on Education and Technology on Education and Technology

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2000 *The National Technology Education Plan, e-Learning: Putting a World-Class Education at the Fingertips of All Children*

U.S. Department of Education

*The Power of the Internet for Learning*

Web-based Education Commission

*The Secretary's Conference on Educational Technology, Measuring Impacts and Shaping the Future*

U.S. Department of Education

*School and Technology Readiness Report. The Power of Digital Learning: Integrating Digital Content*

The CEO Forum on Education and Technology on Education and Technology

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2001 *Any Time, Any Place, Any Path, Any Pace: Taking the Lead on e-Learning Policy*

National Association of State Boards of Education

*Education Technology Must Be Included in Comprehensive Legislation*

CEO Forum on Education and Technology on Education and Technology

*Investing in K-12 Technology Equipment: Strategies for State Policymakers*

Education Commission of the States

*Student Achievement in the 21st Century: Assessment, Alignment, Accountability, Access, Analysis*

CEO Forum on Education and Technology on Education and Technology

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- 2002      *Technically Speaking: Why All Americans Need to Know More About Technology*  
National Academy of Engineering, National Research Council
- Visions 2020: Transforming Education and Training Through Advanced Technologies*  
U.S. Department of Commerce, Technology Administration
- 
- 2003      *Learning for the 21st Century*  
Partnership for 21st Century Skills
- The Sustainability Challenge: Taking Ed-Tech to the Next Level*  
Benton Foundation, EDC/Center for Children & Technology
-

APPENDIX B

RESEARCHER'S VITAE

# Kameron Conner Ball

5107 Heatherton Drive  
Jackson, Mississippi 39211

(601) 421-3582 *mobile*  
kball@rcsd.ms

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- EDUCATION:**
- Doctor of Philosophy (anticipated December 2005)** – Educational Leadership  
Mississippi State University, Mississippi State, Mississippi  
Dissertation Title: Plugged in: A case study of an exemplary  
technology-using teacher
- Master of Science (August 1997)** – Technology  
Emphasis in Instructional Technology  
Mississippi State University, Mississippi State, Mississippi  
Graduated Summa Cum Laude with 4.0 Grade Point Average
- Bachelor of Science (December 1993)** – Elementary Education  
Mississippi State University, Mississippi State, Mississippi  
Graduated Magna Cum Laude
- CAREER-RELATED EXPERIENCE:**
- Director of Federal Programs**  
Rankin County School District, Brandon, Mississippi  
May 2004 – present
- Administer all federally-funded programs for which district students are eligible
  - Assist federally-funded schools with meeting the requirements for No Child Left Behind and implementing state and federal accountability measures
  - Manage \$7.6 million dollar budget
  - Supervise district English acquisition program, which serves approximately 260 students and employs ten professional staff members
  - Coordinates summer camp and after school programs at two school sites, which serve approximately 300 students and employs over 45 individuals
  - Direct district drug prevention, parental involvement, out-of-school tutoring, and arts instruction and activities
  - Coordinate four Comprehensive School Reform grant programs and two 21<sup>st</sup> Century Learning Center grant programs
  - Serve as district grant writer for all departments
- State Director of Educational Technology**  
Mississippi Department of Education, Jackson, Mississippi  
September 2002 – April 2004
- Administered and directed the Office of Educational Technology and the Division of Textbook Adoption, which entailed a staff of 17 individuals
  - Managed \$15.6 million dollar budget
  - Served as designated board member to the Council for Education Technology, a ten member advisory council to the State Board of Education and Mississippi Legislature
  - Provided leadership, assistance, support, and vision in the use of educational technology to the public schools in Mississippi.
  - Facilitated the development, implementation, and revision of the Mississippi Department of Education Technology Plan.
  - Secured alternative funding through federal, private, and special grant sources

- Oversaw \$8.3 million dollars in federal Enhancing Education Through Technology grants and supervise the competitive grant process to districts
- Supervised the implementation of two Bill and Melinda Gates Foundation grants, plus three additional private grants including a five-year BellSouth Signature Grant for enhancing teacher quality through technology training
- Facilitated the implementation of the 2000 Catalyst PT3 Grant, MS.Triad.Net

#### **Elementary Curriculum Specialist**

Rankin County School District, Brandon, Mississippi

July 2000 – August 2002

- Developed *Sourcebook for Reading Instruction* for K-12 teachers
- Trained teachers in research-based, individualized instructional strategies
- Planned professional development, curriculum, procurement, and assessment strategies with other district administrators, school leaders, and teachers
- Wrote grant proposals to supplement reading materials
- Revised elementary report cards to reflect individualized instruction/achievement
- Assisted in implementation of Principal Study Groups for school improvement
- Directed 2001 Reading Sufficiency Grant at Puckett Elementary School
- Advised principals in curriculum purchases and implementation
- Designed the first RCSD New Teacher Orientation CD-ROM with digital video

#### **Master Teacher-in-Residence, Department of Curriculum and Instruction**

Mississippi State University, Mississippi State, Mississippi

August 1999 – May 2000

- Taught two sections of EDE 4113—Science for Children and EDE 4123—Elementary School Arithmetic, and four sections of EDE 4133—Language Arts
- Facilitated the design, implementation, and strategic growth of the professional development school model within a field-based course setting at four school sites.
- Supervised, observed, and evaluated eighty senior elementary education students placed in over forty kindergarten – eighth grade classrooms

#### **Adjunct Instructor, Continuing Education**

Mississippi University for Women, Columbus, Mississippi

June 1999 – August 1999

- Taught four technology courses for K-12 educators
- Developed the first MUW Technology Day Camp offered to PK–2<sup>nd</sup> grade children

#### **Lecturer, Department of Instructional Technology**

Mississippi State University, Mississippi State, Mississippi

August 1998 – May 1999

- Taught four sections of TKT 1273 Microcomputers in Education
- Familiarized students with educational software and telecommunications activities appropriate for elementary and secondary classrooms

#### **Elementary Teacher**

McGehee Elementary School, McGehee, Arkansas

August 1997 – May 1998

- Chaired the McGehee Elementary Building Renewal Council
- Served as a member of the McGehee School District Technology Committee, Reading Curriculum Team, and Renewal Council
- Developed the McGehee School District Technology Plan
- Selected to attend the 1998 Arkansas Leadership Academy

#### **Technology and Special Projects Coordinator**

Tupelo Public School District, Tupelo, Mississippi

August 1996 – June 1997

- Provided oversight for all technology decisions made within the school district consisting of 11 school sites, approximately 500 certified teachers and 7,000 students
- Trained K-12 educators using various software and hardware
- Organized the development of local area networks in each school
- Reported to the Tupelo Public School District Board of Trustees bi-monthly
- Published the Tupelo Public School District Technology Plan which received \$384,000 from the Mississippi Department of Education
- Secured and managed approximately one-half million dollars in grant monies
- Organized and supervised local Net Day initiatives to wire two elementary schools
- Developed *Lesson Link*, a monthly newsletter focusing on using technology to strengthen home and school communications

#### **Elementary Teacher**

Rankin Elementary School, Tupelo, Mississippi

January 1994 – May 1996

- Taught first/second multi-age, second grade, and fourth grade classes
- Spearheaded the *Rankin Online Project*, allowing Rankin Elementary School to become the first elementary school in Mississippi to have an Internet connection in every classroom

#### **GRANTS:**

##### **Comprehensive School Reform, January 2005 - \$65,000 per school**

Rankin County School District – funded by Mississippi Department of Education

##### **Quality Classrooms in Mississippi, October 2003 - \$860,000**

Office of Educational Technology – funded by BellSouth Foundation

##### **Technology Academy for School Leaders, June 2003 - \$850,000**

Office of Educational Technology –funded by Bill and Melinda Gates Foundation  
Two year project extension – only technology grant extension given in the nation

##### **Teach to the Future, April 2003 - \$40,000**

Office of Educational Technology – funded by Intel Foundation  
*Commitment made to fund annually for five years with demonstrated progress*

##### **Mississippi Reading Sufficiency Program, June 2001 – \$116,600**

Rankin County School District – funded by Mississippi Department of Education

##### **Goals 2000 Professional Development Grant Program, May 2001 - \$75,000**

Rankin County School District – funded by Mississippi Department of Education

##### **The Literacy Connection, May 1997 - \$51,200**

Tupelo Public School District – funded by E. R. Carpenter Foundation

**The Literacy Connection, May 1997 - \$35,000**

Tupelo Public School District – funded by CREATE Foundation

**Preservice Teacher Education – The Cutting Edge, March 1997 - \$23,000**

Tupelo Public School District – funded by Mississippi Department of Education

- PRESENTATIONS:**
- Creating Futures through Technology Conference**  
February 2004 – Biloxi, Mississippi  
Luncheon Keynote Presenter: *Meet the Millennials: The Incoming Freshmen of 2004*
  - 2003 National Leadership Institute**  
State Educational Technology Director's Association  
December 2003 – Washington, DC  
*Technology Leadership for the 21<sup>st</sup> Century*
  - Mississippi Association of School Superintendents Fall 2003 Conference**  
October 2003 – Vicksburg, Mississippi  
*Technology Planning Assistance*
  - 2002 National Leadership Institute**  
State Educational Technology Director's Association  
December 2003 – Washington, DC  
*Developing the National Educational Technology Plan*
  - Mississippi Association of Federal Program Directors Conference**  
July 2001 – Biloxi, Mississippi  
*The Three R's: Rankin County, Reading, and Reform*
  - Mississippi Association of Federal Program Directors Conference**  
July 2001 – Biloxi, Mississippi  
*An After-School Reading Tutorial Program That Works!*
  - National Professional Development Schools Conference**  
March 2000 – Columbia, South Carolina  
*Mississippi LEADS: Mississippi State University's Senior Methods Block*
  - Mississippi Educational Computing Association Conference**  
February 1999 – Jackson, Mississippi  
*Orange Jell-O, Elbow Macaroni, and Technology Planning*
  - Southeastern Arkansas Educational Cooperative**  
June 1998 – Monticello, Arkansas  
*Utilizing Technology for Learners with Special Needs*
- PROFESSIONAL ASSOCIATIONS:**
- Association for Supervision and Curriculum Development
  - International Society for Technology in Education
  - Mississippi Alliance for Arts Education
  - Mississippi Association for Supervision and Curriculum Development
  - Mississippi Association of School Administrators
  - Mississippi Educational Computing Association
  - Mississippi Association of Federal Education Program Directors
  - Phi Delta Kappa

- PUBLICATIONS:**
- The Guidebook for Effective K-12 Videoconferencing***  
Co-authored with staff from Mississippi Department of Education,  
Mississippi Public Broadcasting and Information Technology Services

April 2004

***Mississippi Interactive Video Network Facilitator's Manual***

Co-authored with members of the Council for Education Technology  
Interactive Video Network Common Needs Subcommittee  
February 2004

***Mississippi Department of Education's Educational  
Technology Plan***

Office of Educational Technology  
January 2003

***Professional Development Partnerships Integrating  
Educational Technology***

Teresa B. Jayroe, Kameron C. Ball, and Michael R. Novinski  
Journal of Computing in Teacher Education Volume 18, Number 1

***Mississippi LEADS: Leading Educational Advancement and Developing  
Strategies for Success***

National Professional Development Schools Conference Proceedings  
March 2000

***Visions and Revisions – A Guide for Updating a Technology  
Plan***, co-author

National Center for Technology Planning  
December 1996

***Koalaty Learning***

Electronic Learning

Networking and the Internet Supplement, Volume 15, Issue 5  
March 1996

**HONORS:**

**Apple Distinguished Educator**

Class of 2005

***Education Week – January 15, 1997***

Featured in “The Comfort Zone”  
Online version located in the archives at <http://www.edweek.com>

***Teacher Magazine – January 1997***

Featured in “Cyber Scout” one of five profiles in “Techno-Missionaries”  
Online version located at <http://www.edweek.com/tm/1997/04conner.b08>

**International Society for Technology in Education**

**National Telecommunications Lesson Plan Winner – May 1996**

“Koala’s Adventures: A Telecommunications Project”

**Sallie Mae First Year Teacher of the Year 1995**

Tupelo Public School District Winner, State of Mississippi Runner-Up

**AT&T ED's Oasis, Former National Advisory Board Member**

Council for Educational Technology Networking Subcommittee, Former Chair  
Mississippi Alliance for Arts Education, Board Member  
Mississippi Educational Computing Association, Board Member  
Mississippi Department of Education 1997 Educational Alliance Task Force

APPENDIX C

INSTITUTIONAL REVIEW BOARD FOR THE PROTECTION OF HUMAN  
SUBJECTS IN RESEARCH APPROVAL



October 12, 2005

Kameron Ball  
5107 Heatherton Drive  
Jackson, MS 39211

Re: IRB Docket #05-237: Plugged In: A Case Study of an Exemplary Technology-Using Teacher

Dear Ms. Ball:

The above referenced project was reviewed and approved via administrative review on October 12, 2005 in accordance with 45 CFR 46.101 b(1). Continuing review is not necessary for this project. However, any modification to the project must be reviewed and approved by the IRB prior to implementation. Any failure to adhere to the approved protocol could result in suspension or termination of your project. The IRB reserves the right, at anytime during the project period, to observe you and the additional researchers on this project.

Please refer to your IRB number (#05-237) when contacting our office regarding this application.

Thank you for your cooperation and good luck to you in conducting this research project. If you have questions or concerns, please contact me at [jmiller@research.msstate.edu](mailto:jmiller@research.msstate.edu) or 325-5220.

Sincerely,

A handwritten signature in blue ink that reads "Jonathan E. Miller".

Jonathan E. Miller  
IRB Coordinator

cc: James Davis

APPENDIX D

INTERVIEW PROTOCOL PARTICIPATING TEACHER

### Interview Protocol – Participating Teacher

1. Understanding the level of technology integration.
2. Understanding the instructional design and delivery methods.
3. Concerns regarding teaching writing skills.
4. Discussion of how technology enhances student learning.
5. Discussion of the process of change and professional growth regarding instructional practice.

APPENDIX E

INTERVIEW PROTOCOL SCHOOL PRINCIPAL

### Interview Protocol – School Principal

1. Understanding the level of technology integration.
2. Actions which have supported technology integration and writing instruction.
3. Discussion of the influence the participating teacher has on other faculty members.
4. Discussion of how technology enhances student learning.
5. Concerns regarding effective technology integration school-wide.

APPENDIX F

INTERVIEW PROTOCOL DISTRICT ADMINISTRATOR

### Interview Protocol – District Administrator

1. Understanding the level of technology integration throughout the district.
2. Discussion of the district's plan for technology integration and writing instruction.
3. Discussion of how technology enhances student learning.
4. Concerns regarding effective technology integration district-wide.

APPENDIX G

OBSERVATION PROTOCOL

## Observation Protocol

1. Classroom structure, environment
2. Student assignments, engagement
3. Technology integration activities - evidence of ongoing technology use
4. Writing process assignments - evidence of daily writing activities

APPENDIX H

DOCUMENT ANALYSIS PROTOCOL

## Document Analysis

1. Teacher-created lesson plans
2. District technology plan
3. School technology plan or records
4. Evidence of teacher professional development