

2-6-2007

# High School Language Arts Teachers' Experiences with Integrating Technology after Participating in a State-Mandated Technology Professional Development Course

Stacy Rae Byous

Follow this and additional works at: [http://digitalarchive.gsu.edu/msit\\_diss](http://digitalarchive.gsu.edu/msit_diss)

---

## Recommended Citation

Byous, Stacy Rae, "High School Language Arts Teachers' Experiences with Integrating Technology after Participating in a State-Mandated Technology Professional Development Course" (2007). *Middle-Secondary Education and Instructional Technology Dissertations*. Paper 11.

This Dissertation is brought to you for free and open access by the Department of Middle-Secondary Education and Instructional Technology at Digital Archive @ GSU. It has been accepted for inclusion in Middle-Secondary Education and Instructional Technology Dissertations by an authorized administrator of Digital Archive @ GSU. For more information, please contact [digitalarchive@gsu.edu](mailto:digitalarchive@gsu.edu).

## ACCEPTANCE

This dissertation, HIGH SCHOOL LANGUAGE ARTS TEACHERS' EXPERIENCES WITH INTEGRATING TECHNOLOGY AFTER PARTICIPATING IN A STATE-MANDATED TECHNOLOGY PROFESSIONAL DEVELOPMENT COURSE, by STACY RAE BYOUS, was prepared under the direction of the candidate's Dissertation Advisory Committee. It is accepted by the committee members in partial fulfillment of the requirement for the degree Doctor of Philosophy in the College of Education, Georgia State University.

The Dissertation Advisory Committee and the student's Department Chair, as representatives of the faculty, certify that this dissertation has met all standards of excellence and scholarship as determined by the faculty. The dean of the College of Education concurs.

---

Joyce E. Many, Ph.D.  
Committee Chair

---

Laurie B. Dias, Ph.D.  
Committee Member

---

Ewa McGrail, Ph.D.  
Committee Member

---

Dana L. Fox, Ph.D.  
Committee Member

---

Date

---

Joyce E. Many, Ph.D.  
Chair, Department of Middle and Secondary Education  
and Instructional Technology

---

Ronald P. Colarusso, Ed.D.  
Dean, College of Education

## AUTHOR'S STATEMENT

By presenting this dissertation as a partial fulfillment of the requirements for the advanced degree from Georgia State University, I agree that the library of Georgia State University shall make it available for inspection and circulation in accordance with its regulations governing materials of this type. I agree that permission to quote, to copy from, or to publish this dissertation may be granted by the professor under whose direction it was written, by the College of Education's director of graduate studies and research, or by me. Such quoting, copying, or publishing must be solely for scholarly purposes and will not involve potential financial gain. It is understood that any copying from or publication of this dissertation which involves potential financial gain will not be allowed without my permission.

---

Stacy Rae Byous

## NOTICE TO BORROWERS

All dissertations deposited in the Georgia State University library must be used in accordance with the stipulations prescribed by the author in the preceding statement. The author of this dissertation is:

Stacy Rae Byous  
50 Taylor Road  
Suwanee, GA 30024

The director of this dissertation is:

Dr. Joyce E. Many  
Department of Middle and Secondary Education  
and Instructional Technology  
College of Education  
Georgia State University  
Atlanta, GA 30303-3083

## Vita

Stacy Rae Byous  
50 Taylor Road  
Suwanee, GA 30024

### EDUCATION:

Ph.D. 2006 Georgia State University  
Teaching and Learning  
MST 1992 State University of New York at Potsdam College  
Education  
B.S. 1990 Southern Vermont College  
Business Administration

### PROFESSIONAL EXPERIENCE:

1999-Present Business Education Teacher  
Collins Hill High School, Suwanee, GA  
1996-2000 Business Education Teacher  
Gwinnett Technical Institute, Lawrenceville, GA  
1996-1999 Middle School Reading Teacher  
Lilburn Middle School, Lilburn, GA  
1993-1996 Third Grade Teacher  
Panola Way Elementary, Lithonia, GA  
1996 Reading Teacher  
DeKalb Technical Institute, Atlanta, GA

### PRESENTATIONS:

Byous, S. (2002, March). *Literature circles and book clubs*. Staff development training at Kanoheda Elementary School, Lawrenceville, Georgia.

Byous, S. (2001, January). *Elementary school teachers using literature circles in the classroom*. Workshop presented at Georgia Read-Write Now Conference, Atlanta, Georgia.

Stephenson, J., Byous, S., & Miller, A. (2000, October). *Using literature circles in your classroom*. Workshop presented at Gwinnett Reading Council, Lawrenceville, Georgia.

Stephenson, J., Byous, S., Eickholdt, L., & Miller, A. (2000, February). *Literature circles and book clubs*. Keynote address conducted at the meeting of the Georgia State University Reading Consortium's 2000 Reading Forum, Atlanta, Georgia.

Byous, S. (2000, February). *Better than book reports*. Workshop presented at the Georgia Read-Write Now Conference, Atlanta, Georgia.

Stephenson, J., Byous, S., Eickholdt, L., Gleason, K., Miller, A., Regan, K., & Rubano, G. (2000, February). *Literature circles and book clubs*. Workshop presented at the Georgia Read-Write Now Conference, Atlanta, Georgia.

#### AWARDS:

2006	Gwinnett County Retired Educators Association Scholarship	GCREA
2005	Horace Mann Scholarship	Horace Mann
2005	Teacher of the Year	Accent Gwinnett Magazine
2003	Teacher of the Month	Collins Hill High School
2000	Educational Excellence Award	Phi Delta Kappa
2000	Target Teacher Scholarship	Collins Hill High School
1999	Nominated for Honor Teacher Award – AJC	Lilburn Middle
1998	Principal's Award for Excellence	Lilburn Middle
1997	Instructor of the Year	Gwinnett Tech
1997	Positive Course Evaluation Award	Gwinnett Tech
1997	Excellence in Instruction	Gwinnett Tech
1996	Red Apple Award for Innovative Teaching Methods	Panola Way Elem.

#### AFFILIATIONS:

1996-present	Georgia Business Educators Association
1996-present	Gwinnett Reading Council
1996-present	International Reading Association
1996-present	National Business Educators Association
1993-present	Phi Delta Kappa
1998-1999	Teachers as Leaders

## ABSTRACT

### HIGH SCHOOL LANGUAGE ARTS TEACHERS' EXPERIENCES WITH INTEGRATING TECHNOLOGY AFTER PARTICIPATING IN A STATE- MANDATED TECHNOLOGY PROFESSIONAL DEVELOPMENT COURSE

by  
Stacy Rae Byous

Georgia has invested millions of dollars for technology and teacher technology training in order to prepare students for a technological society (Brackett, Henry, & Weathersby, 1999; Hinton, 2003). While technology affects all teachers, language arts teachers are also challenged to teach multiple literacies (Leu, Kinzer, Coiro, & Cammack, 2004). This study investigated the extent that professional development programs impact the language arts teachers' classroom practice (Bebell, Russell, & O'Dwyer, 2004; Young & Bush, 2004).

This case study research explored three high school language arts teachers' experiences with integrating technology after having participated in a state-mandated professional development course on technology. Rogers' (1995) Adoption and Diffusion Model was used as a framework in order to understand the factors that influence adoption of innovations and to explore factors that act as barriers or enhance the adoption process.

An emergent qualitative research design was used to investigate the following research questions: (1) In what ways do high school language arts teachers integrate technology into their curriculum after completion of said course? (2) To what extent are these practices representative of the experiences addressed in the professional

development course? (3) What are teachers' perceptions of technology integration in the language arts classroom?

Data sources included formal interviews, video-taped lessons, observational field notes, teacher portfolios, and other written communications to supplement face to face interviews. A constant comparative method (Glaser & Strauss, 1967; Lincoln & Guba, 1985) was used throughout the study by assigning each piece of data a code and category, which was revised and modified as new data were incorporated (Bogdan & Biklen, 1992).

Rigor was established through member checks and triangulation of the data. Four themes emerged from the data: (a) technology was adopted as a tool, (b) TAFT resulted in engagement and enthusiasm for using technology, (c) restrictions on time impacted technology integration, and (d) available technology sat idle.

Although technology was not used to its fullest potential, the discussion emphasizes that technology training led to technology implementation and impacted classroom practice. The teachers' perceived attributes of the technologies, and their stance and perceptions of literacy and technology affected their technology integration and determined their adoption and adaptation of technologies.

HIGH SCHOOL LANGUAGE ARTS TEACHERS' EXPERIENCES WITH  
INTEGRATING TECHNOLOGY AFTER PARTICIPATING IN A STATE-  
MANDATED TECHNOLOGY PROFESSIONAL DEVELOPMENT COURSE

by  
Stacy R. Byous

A Dissertation

Presented in Partial Fulfillment of Requirements for the  
Degree of  
Doctor of Philosophy  
in  
Language and Literacy Education  
in  
the Department of Middle and Secondary  
and  
Instructional Technology  
in  
the College of Education  
Georgia State University

Atlanta, Georgia  
2006

Copyright by  
Stacy Rae Byous  
2006

## DEDICATION

This dissertation is lovingly dedicated to my Grandmother, Rita “Chick Pea” Dumond.  
You are greatly loved and missed.

## ACKNOWLEDGEMENTS

The completion of this degree would have not been possible without the help, love, support, patience, and encouragement from my family, friends, colleagues, and mentors. This work is lovingly dedicated to my husband, Ken. You gave me your love, encouragement, patience, and inner strength when mine failed. You encouraged me each time I hit a bump in the road. You made me laugh at myself and helped me to have perspective on what was truly important in life. This dissertation is as much yours as it is mine. In the future, I promise not too much jibber-jabber.

I especially thank you, my parents, Gary and Angel Carpenter, for a lifetime of love and support and for the lessons of life you have taught me. I am blessed to have parents who have supported me when I wanted to give up and who were always willing to lend a sympathetic ear and a helping hand. You were always willing to help with whatever needed to be done so that I could work on school work.

I appreciate the friendships I have made along the way. A sincere thank you to my friend, Dr. Cassie Race for your knowledge and support were an inspiration to me. You led the way and I followed your path. Your willingness to guide me with helpful suggestions, your constant laughter, your energy, and pizza at Little Italy were needed during my many times of self-doubt. I would not trade a single conversation or slice of pizza. I am truly indebted to you.

To all my friends and family, I thank you for your understanding when my professional priorities superseded my personal relationships. This is finally over, so look out Joan and Verna. What am I to do with all this time on my hands?

I thank my committee members for their leadership and support. I am especially grateful to Dr. Joyce E. Many. As my teacher and advisor, you encouraged me every step of the way of this challenging process. You taught me, hosted me in your home, and supported me during my course work and dissertation. My other committee members, Dr. Laurie B. Dias, Dr. Ewa McGrail, and Dr. Dana L. Fox all have contributed to the success of this dissertation. You each brought your own expertise to help guide me.

My gratitude goes to my colleagues who put up with my grumbles throughout the dissertation process. You encouraged and supported me and now it is my turn to help you. Carolyn Garner and Mary Taylor, thank you for editing this piece of writing. Participants, thank you for allowing me to observe your technology lessons and for giving up valuable time for interviews. I appreciate your honesty and have learned a lot from all of you.

All of you have made this journey bearable and I am a better person for knowing all of you.

## TABLE OF CONTENTS

Abbreviations .....		ix
Chapter		
1	INTRODUCTION.....	1
	Rationale.....	3
	Purpose of the Study .....	8
	Research Questions .....	8
	Overview of the Study.....	9
	Significance .....	9
	Terms and Definitions.....	11
2	BACKGROUND.....	13
	Framework for the Study.....	13
	Adoption and Diffusion Model .....	13
	Adoption and Diffusion of Technology Research.....	16
	Related Literature .....	20
	Professional Development Defined.....	21
	History of Staff Development and Technology.....	22
	Characteristics of Effective Technology	
	Staff Development.....	25
	Impact of Staff Development in the Classroom .....	29
	Technology Integration .....	32
	Technology and Literacy.....	39
	Technology in the Language Arts Classroom .....	46
	Teacher Perceptions .....	52
	Summary .....	53
3	METHODOLOGY .....	55
	Design of the Study .....	55
	Context .....	56
	Participants .....	60
	Role of the Researcher .....	62
	Data Sources.....	64
	Data Collection.....	64
	Data Analysis .....	72
	Establishing Rigor .....	77
	Limitations .....	79

4	RESULTS.....	81
	The Case Studies .....	81
	Gavin’s Background.....	81
	Gavin’s Classroom .....	84
	Gavin’s Use of Technology.....	85
	Gavin’s Stance toward Literacy and Technology .....	87
	Ashley’s Background .....	97
	Ashley’s Classroom.....	98
	Ashley’s Use of Technology .....	100
	Ashley’s Stance toward Literacy and Technology .....	102
	Amber’s Background .....	111
	Amber’s Classroom.....	112
	Amber’s Use of Technology .....	114
	Amber’s Stance toward Literacy and Technology .....	116
	Cross Case Analysis .....	126
	Theme 1: Technology Learned in a State-Mandated Course was Adopted and Diffused .....	127
	Theme 2: TAFT Resulted in Engagement and Enthusiasm .....	131
	Theme 3: Restrictions on Time Impacted Technology Integration .....	134
	Theme 4: Available Technology Sat Idle.....	135
5	DISCUSSION AND CONCLUSIONS .....	139
	Training Predicted Implementation.....	140
	Training Was Not Used To Its Fullest Potential .....	144
	Technology Learned in a State-Mandated Course Was Adopted and Diffused .....	147
	Technology Use Was Affected by Participants’ Stance Toward Literacy and Technology .....	151
	Technology Use Was Affected by Participants’ Perceptions of Literacy and Technology .....	156
	Recommendations for Future Research.....	157
	Implications for Professional Development .....	158
	Conclusion.....	163
	References .....	165
	Appendixes .....	182
	Appendix A: A Two-Level Approach to an Inservice Program.....	182
	Appendix B: Seven Stances Toward Technology .....	183
	Appendix C: Consent Form.....	184
	Appendix D: Interview Questionnaire Survey .....	186
	Appendix E: Interview Questions .....	191
	Appendix F: Sample of Categories and Themes .....	192
	Appendix G: Data Reduction .....	193
	Appendix H: Chinese and Japanese Poetry Project.....	196
	Appendix I: Parody Project for Dante’s Inferno .....	197
	Appendix J: Persuasive Research Paper.....	198

## LIST OF TABLES

### Table

1	Technology Sets of Equipment.....	60
2	Individual Technology Equipment .....	60
3	Demographic Information for Participants .....	62
4	Schedule for Data Collection .....	68
5	Gavin’s Initial Observation and Observations for Literary Territory Project.....	70
6	Ashley’s Initial Observation and Observations for Three Technology Projects.....	70
7	Amber’s Initial Observation and Observations for Six Technology Projects.....	71
8	Components Adopted and Adapted Directly From TAFT .....	128
9	TAFT Competencies Implemented.....	133

## ABBREVIATIONS

AKS	Academic Knowledge and Skills
ImPact	Implementing Partnerships Across the Curriculum with Technology
IRA	International Reading Association
LSTC	Local School Technology Coordinator
NCES	National Center for Educational Statistics
NETS	National Educational Technology Standards
NETS*S	National Educational Technology Standards for Students
PT3	Preparing Tomorrow's Teachers to Use Technology
TESOL	Teaching English to Speakers of Other Languages
TST	Technology School Technician
TTL	Teacher Technology Leaders

## CHAPTER1

### INTRODUCTION

Georgia has invested millions of technology dollars into its educational school systems (Brackett, Henry, & Weathersby, 1999; Hinton, 2003) because technology is regarded as a powerful learning tool to improve teaching and student learning (Grabe & Grabe, 1998; Jonassen & Reeves, 1996; Whale, 2006).

As advances in technology race ahead, we must ensure that the nation's students become technologically literate. Not to meet this challenge will mean that American students will only fall further and further behind. With reading, writing, and arithmetic, technology has become the nation's 'new basic.' Our children's future, the future economic health of the nation, and the competence of America's workforce depends on meeting this challenge. (U. S. Department of Education, 1996, p.4)

Technology use has become essential in conducting day-to-day operations and even menial labor jobs now involve the use of computers. Students entering the workforce need the necessary skills to interact at the business level (National Educational Technology Standards [NETS], 2002; Policies Commission, 1993); however, the rapid move to place computers in the classroom left a large number of teachers with little or no computer training in their preservice coursework (Bauer & Kenton, 2005; Stapes,

Pugach, & Himes, 2005; Yaghi, 1996). There is a need, therefore, for additional preparation in technology in order to integrate technology into the classrooms.

In the larger picture, while all teachers are affected by technology, language arts teachers must learn not only to teach the literacies of reading and writing, but they must also teach the new literacies. These new literacies include teaching how to effectively use new technologies for information gathering and teaching about new methods communication (Cunningham, 2000; International Reading Association [IRA], 2002; Leu, Kinzer, Coiro, & Cammack, 2004; Leu, Mallette, & Karchmer, 2001; Luke 2000; Reinking, McKenna, Labbo & Kieffer, 1998). These literacies include using word processors, email, presentation software, and the Internet (IRA, 2002; Teale, Labbo, Kinzer & Leu, 2002). Consequently, there is a need to make sure teachers have the skills needed to prepare students to live and work in a technological society (Pope & Golub, 2000).

Over the last ten to fifteen years, vast amounts of money has been spent on technology and technology training (Brackett et al., 1999; Hinton, 2003; Lewis, 1999; Young & Bush, 2004). At the same time, we still do not know to what extent professional development and technology integration actually impacts language arts teachers' classroom practice (Bebell, Russell, & O'Dwyer, 2004; Young & Bush, 2004). This is because there is not a clear understanding of how teachers adopt technologies learned in a professional development course into their classroom practice. In addition, we do not know what technologies teachers do not adopt nor the reasons behind their reluctance to implement the new technologies (Bebell et al., 2004). Little research has

investigated the transfer of technology training in professional development to actual classroom practice (Reichstetter, 1999; Thompson, 2005). Deleted line

### *Rationale*

Although vast amounts of money have been spent on technology and teacher training (Brackett, et al., 1999; Lewis, 1999; Young & Bush, 2004), research has not adequately documented what teachers do with the skills they have learned (Bebell et al., 2004; Young & Bush, 2004). We do not have a clear understanding which skills teachers adopt (Russell, Bebell, O'Dwyer, & O'Connor, 2003) after participating in a state-mandated technology professional learning course. Also, after a thorough review of the literature, there are very few qualitative studies that focus on high school language arts teachers, in terms of the adoption and diffusion of technology integration.

Several reports and studies have discussed in detail school technology expenditures. According to the 2001 United States Census Bureau report, schools have spent over 500 million dollars on computers, software, and teacher training. The report "A Nation Online: How Americans are Expanding Their Use of the Internet," stated that there were two million new Internet users per month and that half of our population was on-line. The report indicated that children and teenagers were the most frequent users and by age 10 they used the Internet more than those 25 and older. One-fifth of elementary children used computers for school. Also in 2001, the Pew Internet and American Life Project reported on today's computer use and student perceptions. One hundred thirty-six students from 36 high schools across the county participated in the study. In the report, students said they completed homework quicker, were less likely to have difficulty on material they did not understand, and their papers had up-to-date

sources. Students also admitted they multitasked on-line; they conducted research, downloaded music, instant-messaged, and prepared PowerPoint presentations all at the same time. However, students critiqued their class work stating that teachers choose Internet assignments of low quality and that were uninspiring (Pew, 2001). With students' increased access to information and the necessity of teaching students new technological literacies to compete in an emerging information age, many believe teacher training will need to be reshaped (Harvey & Purnell, 1995; Jonasson, 1993).

In order to understand the challenges of preparing teachers to use technology, RAND Critical Technologies examined efforts to assist educators to use technology and to define the barriers (Harvey & Purnell, 1995). As a result, the United States Department of Education enacted GOALS 2000: Educate America Act - a plan to use technology effectively. The plan contained several objectives. The objective most closely related to this study was for schools to use technology for students and for teachers to improve education. The following list was the criteria for that objective:

1. All teachers will have the training and support they need to help students learn using computers and the Internet.
2. All teachers will have modern computers in their classrooms.
3. Every classroom will be connected to the Internet. (GOALS 2000, 1994)

After legislation implemented the GOALS 2000 Act, several states enacted their own mandates. Georgia, in particular, created the Statewide Education Technology Plan (1997). The purpose of the technology plan was for "improving student performance and enhancing the teaching/learning process through the effective use of technology" (p. iii). The Georgia Lottery contributed immensely to the technology plan. Between 1994 and 2003, \$2,911,018,178 was awarded to the Department of Education for technology

programs (Hinton, 2003). More than \$231,253,025 was allotted for computers. Within the 83,000 plus classrooms in Georgia, \$33,087,500 was spent on software, \$5,244,236 for technology centers, \$31,238,000 for instructional technology, and \$40,187,500 for media center computers. In addition to spending large amounts of money on hardware and software, the state of Georgia also recognized the need for preparing teachers to be able to integrate technology. In 1999, the lottery provided funding for training teachers and administrators on how to use technology at a cost of \$660,000 (Brackett et al., 1999). At this time, Georgia also formed an Education Reform Study Commission for the sole purpose of studying how to improve the schools by having teachers and students use technology. Based on the results of the study from the Commission, the governor enacted the A Plus Education Reform Act of 2000. One of the initiatives of the Reform Act mandated that all teachers must demonstrate computer competency in order to renew their teaching certificate. The act states that teachers must demonstrate:

satisfactory proficiency on a test of oral and written communication skills, a test of computer skill competency, and an assessment to demonstrate satisfactory on-the-job performance appropriate to the applicant's field of certification.

Successful completion of the phase one InTech model training at a state education technology training center or by a State Board of Education approved redelivery team shall be acceptable for certificate renewal purposes. (p. 65)

Following this state mandate, Jefferson County Public School System (pseudonym) initiated the Technology Academy For Teachers (TAFT). TAFT is a State Board of Education approved course which offered Jefferson County teachers the training needed

to meet state recertification requirements. The course was offered at a variety of sites, dates, and times so that teachers could be taught by their peers in their own school.

In Dias' (2000) study, she emphasized that "Integrating technology is a difficult task for teachers, even if they have had training" (p. 6). Therefore, with the vast amounts of money spent on technology and technology training, research studies focusing upon attempts at technology integration in the classroom are needed (Deacon, 1999; Lewis 1999). Such studies can describe the challenges faced by teachers as they attempt to apply what they have learned, and as a result, can be of benefit in improving the chances of integration into classroom practice.

Previous research which has examined teachers and technology is available. Many of these quantitative studies involved having teachers complete surveys and investigated frequency of computer use or barriers to implementing technology. For example, one self-reporting study found that teachers use technology to prepare lessons, for email, to deliver instruction, to accommodate individual needs, for student use, for student projects, and for grading. The study indicated that teachers mostly use technology for preparation and email (Bebell et al., 2004). Several researchers have investigated barriers to integrating technology. For instance, lack of adequate teacher training and lack of time to develop lesson plans that integrate technology are two of the greatest obstacles in integrating technology into the school's curriculum (Beaver, 1992; Brand, 1998; Brooks & Kopp, 1990; Ertmer, Addison, Lane, Ross, & Woods, 1999; Hadley & Sheingold, 1993; Ingram, 1992; Kinnaman, 1990; Rosen & Weil, 1995; Sheingold & Hadley, 1990; US Congress, 1995; Vagle & College, 1995; Wedman & Diggs, 2001; Yaghi, 1997; Yildirm & Kiraz, 1999). Other studies found the barriers to

include the following: problems scheduling a computer lab, too few computers for the numbers of students, inadequate financial support for computers, too few printers, and not enough help supervising students (Hadley & Sheingold, 1993; Jaber & Moore, 1999; Kinzer & Leu, 1997; Sheingold & Hadley, 1990).

In the few studies conducted with self-reporting measurements, what the teachers said they did with technology and what the researchers observed differed considerably (Cuban, 2001). Sheingold and Hadley (1990) suggested it is more informative to know how teachers use technology than to know how often they use technology. Also, none of the above mentioned studies take into account the cognitive variables that influence the successful or unsuccessful implementation of professional development goals (Marsh, 1992). Research designed using a qualitative case study approach would allow those factors to be explored in a classroom context.

Ray's (2001) quantitative study looked at the impact of professional development training on technology integration in secondary school teachers' classrooms. She found that teachers in all content areas made use of the skills after attending the class, but the study did not specifically state which skills. Nor did the study address if the skills were adopted as is or if they were changed in some way. While there has been some substantial research on personal factors that have led to adoption or rejection of technology in the classroom (Cuban, 2004, 2001; Tyack & Cuban, 1995), there is not a clear understanding of how or why teachers implement certain technologies from a professional development course. Nor do we know what technologies teachers do not implement or what they modify to fit their needs. Developing effective professional learning does not mean technology will be integrated. A myriad of adoption factors

influence the use and implementation of technology (Farquhar & Surry, 1994). Little research has investigated the transfer of technology training in professional development to actual classroom practice (Ketterer, 2000; Reichstetter, 1999).

Because of changes in society, high school language arts teachers are challenged to embrace a wider range of literacies (Downes & Fatouros, 1995). With technology changing what it means to be literate, studies involving technology integration in the language arts classrooms are becoming more pertinent. Only a few qualitative studies have looked at language arts teachers and their experiences with technology in the classroom (Baker, 2001; Karchmer, 2001). Past and current research has not adequately explained how teachers use technologies in the language arts classroom (Hughes, 2000; Young & Bush, 2004).

#### *Purpose of the Study*

In light of the need for research focusing on technology integration in the classroom, the purpose of this qualitative study was to describe the stories of high school language arts teachers as they embarked on a journey to integrate technology into a language arts classroom after taking a technology professional development course that was required by legislature called Technology Academy For Teachers (TAFT). The study focused on how language arts teachers integrate technology into the classroom by understanding their instructional decisions and classroom culture.

Specifically, the following research questions were addressed:

1. In what ways do high school language arts teachers integrate technology into their existing curriculum after having participated in a professional development course focusing on technology?
2. To what extent are these practices representative of the experiences addressed in the professional development course?

3. What are teachers' perceptions of technology integration in the language arts classroom?

### *Overview of the Study*

This qualitative case study explored three high school language arts teachers' experiences with integrating technology after having participated in a state-mandated professional development course on technology. To understand the factors that influenced technology adoption and to discover factors that acted as barriers during the adoption process, Rogers' (1995) Adoption and Diffusion Model was utilized as the framework for the study.

Data sources included formal interviews, video-taped lesson, observational field notes, and teacher portfolios. A constant comparative method (Glaser & Strauss, 1967; Lincoln & Guba, 1985) was employed throughout the study by assigning codes and categories to each piece of data. Rigor was established through triangulation of the data and member checks.

### *Significance*

In the years since the implementation of the A Plus Education Reform Act (2000), all practicing Georgia teachers have been trained to meet the technology requirements stipulated by law and to retain their certification and/or teaching position. However, given the constant changes to technology requirements for teachers, the need for educators to learn new technologies across their career is likely. The results of this study should provide pertinent information to school systems in the future as they continue to provide technology training and consider the follow through of training in classroom practice. Previous researchers (Ray, 2001; Reichstetter, 1999), have indicated that this

type of research may help school systems adequately address shortcomings in the use of computer technology by teachers after training has been completed. The results from this study may also be used to inform other high schools that have similar demographics and socio-economic factors (Reichstetter, 1999).

In addition, the results of this research will inform those employed in school systems who are in charge of teacher training programs. These school leaders will benefit by knowing if there is a transfer of knowledge from a state-mandated professional development technology training class to actual classroom practice. Learning how teachers are using technology in the classroom, learning what and how teachers adopt technologies from a professional development course, and learning what teachers do not adopt from a training course may lead to suggesting types of hardware or software purchases that might assist with integration (Ray, 2001). Schools and teacher education programs are looking for models that have effectively taught their teachers to successfully integrate technology into their classroom (Becker, 1998; National Center for Educational Statistics (NCES), 2000).

On a national level, the No Child Left Behind Act (2002) charged the Secretary of Education with developing the nation's National Education Technology Plan. The plan was to support the effective use of technology in the classroom and to prepare students for the 21<sup>st</sup> century. The plan sought input from a variety of audiences including educators and researchers. The National Educational Technology Plan wants to build "on what has been proven to work and what has been accomplished through previous efforts" (Bush, 2002, p. 2). This study can identify policy issues and provide opportunities for technology to transform America's educational system.

### *Terms and Definitions*

The following definitions will clarify to the reader the meaning of specific terms as used in this study.

*Adaptation:* Adaptation is the process by which the participants in the study took the information they learned in a staff development course and used those new skills in different ways.

*Adoption:* Rogers' Adoption and Diffusion Model is used for the framework of the study. The term adoption is the process by which the participants in the study took the information they learned in a staff development course and adopted or utilized those skills in the classroom.

*Inservice:* Inservice programs are short awareness programs to inform teachers about new ideas (Bellanca, 1995).

*Literacy:* In this study, literacy refers to the ability to read, write, listen, speak, and function in modern society (Bruce & Rubin, 1993; Lankshear, 1997).

*Professional Development:* The term professional development refers to a comprehensive program to improve teachers' ability to design and implement new lessons that produces a change in the classroom (Bellanca, 1995).

*Staff Development:* Staff development provides teachers with opportunities to learn new methods of instruction (Bellanca, 1995).

*Technology:* Technology in the broadest term could mean transparencies, audio tapes, video tapes, television, laser discs, digital video discs, word processing, email, CD-ROMs, printers, scanners, and various software programs. Because the word technology

could encompass hundreds of different contexts, the term needs to be narrowed for this study. For this study, technology requires the use of the computer.

*Technology Fluency:* The term of technology fluency refers to teachers' use of technology where teachers are comfortable with technology and can focus on integrating technology into their content area.

*Technology Integration:* Technology integration contributes to teaching and learning by letting students learn with computers as they study, expand, and enhance their content area objectives (Antifaiff, 2000). The integration could be hardware or software based and used with teacher-led or student-led instruction.

## CHAPTER 2

### BACKGROUND

The following section provides the background for this study. There are two sections. The first section is the theoretical framework that provides the underpinnings for the research. The framework for this study is based upon Rogers (1995) Adoption and Diffusion Model. The second section provides a review of the research in relevant areas such as characteristics of effective staff development, technology staff development, technology and literacy, and technology in the language arts classroom.

#### Framework for the Study

##### *Adoption and Diffusion Model*

Developing effective professional learning does not guarantee technology will be integrated. A myriad of adoption factors such as trialability, observability, rate of adoption, complexity, and compatibility influence the use and implementation of technology (Farquhar & Surry, 1994). For this study, an adoption and diffusion model (Rogers' 1995) will be used as the theoretical framework to guide data collection and inform data analysis.

A variety of models have been created to explain the adoption process; for example Bhola (1984), Fullan (1985), Hall and Hord (1987, 2001), Sherry, Billig, Tavalin, and Gibson (2000), and Stockdill and Morehouse (1992) all have designed adoption models. One of the most popular models of the adoption process is that of

Rogers (1995). Rogers' book *Diffusion of Innovations* was first published in 1960 and is now in its fourth edition (1995). This particular study was framed from Rogers' Adoption and Diffusion Model for four reasons. First, researchers say that Rogers is one of the most often cited authors of adoption models. Secondly, Rogers (1995) argued that 87% of adoption of new technology is explained by the attributes that he developed. Third, the attributes that Rogers created, along with the terminology used, is recognized in several studies and across different disciplines (Al-Ghatani, 2003; Surry & Farquhar, 1997). Finally, because I believe that Roger's (1995) Adoption and Diffusion Model is the most thorough model to describe the process of how teachers decide what to adopt, not adopt, or change as they integrate technology into the classroom, this is the viewpoint from which I will approach this research.

Rogers discussed four widely-used diffusion theories: Innovation Decision Process; Individual Innovativeness; Rate of Adoption; and Perceived Attributes. The Innovation Decision Process Theory explains that potential adopters of technology move through five distinct stages. The stages are as follows: (a) Knowledge – the adopters learn about the technology; (b) Persuasion – the adopters must be persuaded about the value and merit of the technology; (c) Decision – the adopters decide to adopt the technology; (d) Implementation – the adopters implement the technology; and (e) Confirmation – the adopter reaffirms or rejects the decision (Rogers, 1995). This particular theory has been cited in numerous pieces of instructional technology literature (Surry & Farquhar, 1997). In fact, Sachs (1993) wrote, “after looking at [the literature] in our field, one might get the impression that the only important thing we need to know

about how to encourage the adoption of innovations or how to be better change agents is that there are five stages to the innovation adoption process” (p. 1).

The Individual Innovativeness Theory (Rogers, 1995) explained that those individuals who are risk takers or who are usually innovative in their actions will adopt the innovation earlier than those who are not. There are two groups of individuals on opposite ends of the spectrum. The innovators will take risks and adopt an innovation early in the diffusion process. The laggards will resist adopting the innovation. They may adopt very late in the process, or they may never end up adopting at all.

Another widely used diffusion theory developed by Rogers (1995) is the Theory of Rate of Adoption. The adoption of an innovation takes place over time. The process resembles an s-curve. The innovation starts off slow with gradual growth. Then the innovation moves through a stage of dramatic and rapid growth. Eventually, the innovation’s rate of adoption will taper off by stabilizing and finally declining.

The Theory of Perceived Attributes states that adopters will judge an innovation based on their perceptions of five attributes. The attributes are as follows: trialability, observability, relative advantage, complexity, and compatibility. Trialability allows the adopter to experiment and try out the innovation on a limited basis before the actual adoption process. The idea behind trying the innovation first is to dismiss uncertainty about the innovation. The rate of adoption is positively influenced by the adopter’s being able to use the innovation. In observability, the results of using the innovation are easily observed, visible, or communicated to others. The rate of adoption is positively influenced when the adopter is able to observe the innovation. Relative advantage means that the innovation has an advantage over other innovations or is better than the status

quo. Sometimes relative advantage is expressed in terms of economic profitability, social prestige, or other benefits. The rate of adoption is positively influenced when the benefits outweigh the cost. Complexity refers to the degree to which the innovation is difficult to use and/or understand. New ideas fall somewhere on a spectrum between simple and complex. The rate of adoption is negatively influenced by the complexity of the innovation. With the last attribute, compatibility, the adopter must see the innovation as compatible with existing values, practices, needs, and circumstances. The rate of adoption is positively influenced when adopters find the innovation fits closely with their lives. The important thing to remember is that it is the adopter's perceptions of the attributes that count, and this is what affects the rate and diffusion of an innovation.

Of the four diffusion theories, the one that is most closely related to this study is the Theory of Perceived Attributes. This theory seems most applicable to the choices high school language arts teachers make when deciding to integrate technology. Approaching this research study within the framework of Rogers' (1995) *Diffusion of Innovations* facilitates understanding the factors that influence adoption of innovations, and instructors and stakeholders can account for factors that act as barriers or enhance those factors that facilitate the process. Rogers' (1995) Adoption and Diffusion Model informs this study because the model helps in understanding the reasons behind the choices that teachers make regarding technology integration in the classroom after participating in a technology professional development course.

#### *Adoption and Diffusion of Technology Research*

Isleem (2003) stated, "While many researchers have studied the diffusion of computer technologies in education, few have studied computer use for instructional

purposes by public school teachers” (p. 27). The following are researchers who have studied adoption and diffusion in the same context as this study.

Hoerup’s (2001) study examining computer technology integration and the role of collaboration was centered in Stewart County, Virginia, at an elementary school. She chose Rogers’ (1995) theory as a framework for her qualitative study. Hoerup looked at integration of technology, the characteristics of the adopters, and how collaboration shapes the process. The participants of the study included seven fifth-grade teachers, a computer resource teacher, and the researcher herself. Her data sources included observations, interviews, and field notes. The most significant finding in her study was that the success of an innovation depends mostly on how innovative the individual adopter is.

Bussey, Dormody, and VanLeeuwen’s (2000) study identified the factors that influence the adoption process of technology education teachers and industrial arts teachers in New Mexico. Of the 310 teachers, a sample size of 169 was selected. The mailed questionnaire was made up of Likert-type questions and was based on the work of Rogers (1995). The questions pertained to the level of adoption of technology education, perceptions of the attributes of technology education, and the influence of change agents on adoption. The questionnaire also contained three checklists to provide a second analysis for the main objective. The checklist measured items important in helping teachers adopt technology education, items that prevented technology adoption, and suggestions to strengthen the adoption of technology education. The results indicated that three of Rogers’ (1995) attributes were present: relative advantage, compatibility, and observability. The best predictor for level of adoption was perception of attributes

followed by the influence of change agents. Therefore, in order to encourage adoption of technology education, change agents should focus their efforts on increasing teacher perceptions of the innovation.

Blankenship (1998) used diffusion of innovations theory by Rogers (1995) as the framework for studying the factors related to teacher use of computers in classroom instruction. His study utilized both qualitative and quantitative methods and focused on 241 K-12 teachers in Carroll County, Virginia. The factors he analyzed included the following: attitude, access, training, support, age, grade level, gender, and numbers of years remaining before retirement. Blankenship found that training was the most common predictor for adoption. The remaining predictors, in descending order were training, attitude, support, access, and age of the teacher.

Jacobsen (1998) incorporated mixed methods to investigate the adoption patterns and characteristics of faculty who integrate computer technology for teaching and learning in higher education. She used Rogers' (1995) theory as an analysis tool to investigate the differences between early adopters and the mainstream faculty in their plans for computer use, computer experience, self-efficacy, participant information, changes to teaching and learning, incentives to integrate technology, barriers to implementing technology, and evaluating the outcomes of using technology. Jacobsen's results showed that computer experience was the most significant factor in adopting technology. She also made some other interesting findings. She learned that the different groups preferred different ways of learning about technology, different types of training and support, and different motivators in implementing the technology. Jacobsen

concluded that colleague-supported training was a positive way to encourage the adoption of technologies.

Isleem (2003) sent self-reporting questionnaires to 1,228 technology education teachers in Ohio Public Schools to identify the extent to which technology education teachers use computers for instructional purposes. He examined five factors in relation to the computer use. He looked at teachers' perceived expertise in computer use, teachers' perceived access to computers, teachers' attitudes toward computers as tools for instructional purposes, teachers' perceived support for computer use, and selected characteristics such as age, gender, grade level taught, geographic location, and educational background of technology education teachers. There were four main findings from the study. The most frequent use of the computer was email, followed by classroom management and then word processing. The least amount of computer use was for multimedia authoring. Isleem found high levels of use in mainstream applications, but low levels in specialized software. Technology education teachers perceived they had expertise in email, Internet and word processing. There was an absence of expertise in multimedia authoring software. The correlation was significant between computer use and expertise. Eighty-four percent of teachers had access to computers at home and 77% had access in the classroom. There was a significant correlation between computer use and access to computers. Ninety-two percent of the technology education teachers had positive attitudes regarding using computers for instructional purposes and stated that computers made learning easier and more efficient. Computer use and attitude had a significant correlation. Finally, 93% of the teachers were in agreement that administrators felt that computers were important for instructional purposes. However,

Isleem did not find enough sufficient evidence for a correlation between computer use and support.

To summarize the findings of the above studies, both Isleem (2003) and Jacobsen (1998) found experience or expertise to be the most influential factor in adopting an innovation. Isleem (2003) and Blankenship (1998) both agreed that attitude was a significant factor in determining the rate of adoption. Bussey et al., (2000) determined that Rogers' (1995) perceptions of attributes was most significant while training was second. Blankenship (1998) found training to be the most significant. Blankenship (1998), Jacobsen (1998) and Hoerup (2001) all found support to be a predictor in the adoption process; however, Isleem (2003) stated that his study contradicted that finding. The difference that Isleem did not mention is that the other studies cited support from colleagues as one of their factors. On the contrary, in Isleem's (2003) study, his support factor was related to support from the administration. Overall, research indicates support from colleagues is important to promote adoption, while support from administration is inconclusive.

#### Related Literature

In the following section, I will discuss the history of staff development and technology and the characteristics of effective staff development as well as how teachers integrate technology after having participated in a technology professional development course. In addition, this literature review provides information on technology integration in the language arts classroom and explains how literacies have changed since the integration of computers in the classroom. Finally, this section will describe teacher perceptions of technology and literacy.

### *Professional Development Defined*

The terms *inservice*, *staff development*, and *professional development* were used interchangeably throughout the literature. However, the terms have evolved over the years and are not synonymous. For this review of literature, the term used in the paragraph is the one that the author of the cited material used.

Historically, inservice days usually occurred at the beginning of a new semester and teachers usually heard motivational speakers. Other times during the year, principals occasionally provided a three-day workshop to remedy teacher deficiencies (Bellanca, 1995; Orlich, 1989). In this approach, although teachers heard new ideas and innovations, they rarely received support to carry them out. In contrast to inservice sessions, the move to a staff development approach often led to the inclusion of scheduled speakers and breakout sessions to the agenda. In this model, teachers frequently could choose which breakout sessions to attend based on their interest. Goals, strategies, time lines, and responsibilities were carried out to ensure changes in curriculum, instruction, and assessment (Bellanca, 1995).

Different from inservice and staff development, the primary goal of professional development was to help the participants learn, implement, and assess their instructional practices by improving knowledge, skills, and attitudes. According to Gall and Renchler (1985), professional development education was defined as “efforts to improve teachers’ capacity to function as effective professionals by having them acquire new knowledge, attitudes, and skills” (p. 6). Grant (2000) expanded on that definition to include technology.

[The] definition of professional development includes support for teachers as they encounter the challenges that come with putting into practice their evolving understandings about the use of technology to support inquiry-based learning. Current technologies offer resources to meet these challenges and provide teachers with a cluster of supports to help them continue to grow in their professional skills, understanding, and interests. (n.p.)

The approach in the TAFT course, which was taken by teachers in this study, is most closely related to the term professional development; therefore that term will be used in the methodology section. In the TAFT course, teachers were provided hands on opportunities to learn technologies and to consider ways to integrate these in their curriculum.

#### *History of Staff Development and Technology*

A growing concern about the effectiveness of staff development became evident in the 1970's (Sparks & Loucks-Horsley, 1989). By 1977, there had been very few articles relevant to staff development research because most of the literature was descriptive or conceptual and only a few articles mentioned existing studies (Showers, Joyce, & Rolheiser-Bennett, 1987). In the 1980's, staff development became the "focus of countless conferences, workshops, articles, books and research reports (Sparks & Loucks-Horsley, 1989, p. 40). Then came efforts to integrate technology into staff development courses (Schaffer & Richardson (2004).

At first, technology staff development courses focused on learning about computer hardware. The problem at this stage was that teachers were not learning how to use the equipment within their classroom context. The second phase of technology staff

development began in the mid-1990s. During these courses, teachers learned software applications (Schaffer & Richardson, 2004). The problems at this phase were that teachers did not have the same software in their school, the software was too difficult to use, or the software had no relevance to what they taught on a daily basis (Kinnaman, 1990; Reinen & Plomp, 1993). Currently, schools are at the third juncture of technology staff development, called *technology fluency* (Schaffer & Richardson, 2004). Teachers are seeking ways to integrate technology into their content areas and to maximize student learning (Cradler, 2002; Schaffer & Richardson, 2004).

Teachers realize the importance of using technology in the classroom (Littrell, Zagumny, & Zagumny, 2005), yet, only 20% of public school teachers say they feel prepared to integrate technology into the classroom (Cradler, 2002; NCES, 2000; Norman, 2000). Technology is not always a key component in teacher preparation programs. When technology is introduced into teacher education programs, the emphasis is often on teaching about technology instead of teaching with technology (Schaffer & Richardson, 2002); therefore, teachers have difficulty integrating technology into the content areas (Voogt, Almekinders, van den Akker, & Moonen, 2005). The Milken Exchange on Education Technology and the International Society for Technology in Education reiterated that obstacle by stating, “in general, teacher-training programs do not provide future teachers with the kinds of experiences necessary to prepare them to use technology effectively in their classrooms” (1999, p. i).

Because of this situation, local, state, and national policy makers are trying to find ways to strengthen technology staff development (Garet, Porter, Desimone, Birman, & Yoon (2001). One such program initiated by the federal government is The Preparing

Tomorrow's Teachers to Use Technology (PT3) grant. In 1998, the United States Department of Education developed this project to help faculty and higher education institutions infuse technology into teacher education programs because many teachers were uncomfortable integrating technology into their classroom (Thompson, 2005). Since 1999 the PT3 has provided more than 400 grants and has invested \$337.5 million dollars to "help transform teacher preparation programs so that teachers can make more effective use of technology as an instructional tool" (Russell, et al., 2003, p. 298). Teachers who participated in teacher education programs with help from PT3 are now beginning their teaching careers. Findings from the data suggest that the PT3 had a positive impact on technology integration. "More than one million teachers and future teachers, several million K-12 students, and thousands of teacher education faculty have been positively affected by the work of PT3" (Thompson, 2005, p. 332).

One such grant not only assisted future educators, but supported the faculty at the University of North Carolina and the faculty collaborating schools by having the grant provide professional development for them. The Teacher Technology Leaders (TTL) three-year project used a team approach with a student teacher, collaborating teacher, and faculty member (Ludwig & Taymans, 2005). For the student teachers, the project helped to redesign classroom curriculum and integrate technology into the student teaching experience. For the faculty at the university and the collaborating school, the grant assisted in redesigning the curriculum, supported the team approach, and expanded technology use and mastery of components (Ludwig & Taymans, 2005).

Another PT3 project entitled *Implementing Partnerships Across the Curriculum with Technology* (ImPact) was funded for the University of Tennessee. Three K-8

schools in Tennessee served the teacher education program as placement sites for student teachers. Professional development was the most important feature of the model to create an organization of highly skilled teachers. The mentor teachers received training in five three-hour sessions throughout one semester. The teachers received a variety of teaching approaches such as curriculum based, hands-on, long-term projects, and modeling of technology integration. There were face-to-face instruction, small group instruction, and large group instruction. At the end of the training, the teachers developed “technology enhanced lessons that align with state curriculum standards and ISTE’s National Education Technology Standards for Students (NETS\*S)” (O’Bannon & Judge, 2004-2005, p. 202). The teachers took a pre-test and post-test consisting of a comparison of technical skills with various technology tools. The results of the projects show that all participants integrated technology significantly more than they did before the beginning of the project and that their confidence level increased. Project ImPact was effective in changing the student teacher education and in developing the mentor teachers who have a crucial role in the development of new teachers.

#### *Characteristics of Effective Technology Staff Development*

There is a need to evaluate and apply characteristics of effective staff development to the technology professional development programs used to prepare inservice teachers (Glenn & Carrier, 1989). Therefore, research relevant to this study focused on effective technology staff development characteristics. This section will address the effective characteristics of technology staff development from 20 years ago to present day. In their 1985 study, Stasz and Shavelson collected surveys from 60 computer-using teachers in 49 schools in California. These teachers were nominated as

successful users of technology by their colleagues and principals. The researchers reported important factors for successful staff development. They stated the need for support during the staff development activities and during the actual implementation of technology into the classroom. They also discussed the need for sufficient time for planning the activities for integrating the technology.

The research by Stecher and Solorzano (1987) was one of the largest studies conducted to determine characteristics of effective technology staff development. Eight school districts and 30 individuals from around the country were asked for nominations to participate in the study. They were asked to select school districts that were doing an outstanding job of training teachers to use computers. The suggestions resulted in 50 organizations made up of 30 school districts, 12 colleges, and six regional education centers. Interviews and observations were used for data collection and the study resulted in several effective practices for staff development. The study revealed that a balance between lecture and guided practice with extensive practice offered in a comfortable and relaxed atmosphere where a knowledgeable instructor could give individualized attention were predictors for successful staff development. Other characteristics included detailed curriculum guides and lessons plans with clear objectives and relevant materials. Furthermore, other components would be intensive voluntary participation and peer interaction.

One of the most comprehensive published books regarding effective technology staff development programs came from Bailey and Lumley (1994). Although the characteristics were not based on their own research, they had a complete list of technology-related references and a comprehensive review of literature regarding

effective characteristics. Their findings stated that teachers needed the commitment and support from the central office, principal leadership with technology, incentives and rewards, and comprehensive staff development that included effective trainers who know how to teach adults, development of a curriculum geared towards participants' interests, and which incorporated time to work collaboratively with other teachers. They also contended that participation in school improvement was important, but not necessary if each participant believed that personal development was important and they could set their own goals and objectives.

Carrier, Glenn, and Sales (1985) and Carrier and Glenn (1991) felt that individualized instruction based on the teachers' level of experience with computers was an important factor. They expanded on the need for individualized instruction by designing a two-level approach for a technology staff development program. They suggested having a beginners program, including very basic instruction in computer use, and an advanced program to meet the needs and varying levels of competencies of the teachers (see Appendix A for detailed information on beginner and advanced programs). Because teachers have varying levels of experience with computers, this design attempted to address those concerns. This type of design helped teachers with different experiences and interests. Ultimately, all the teachers would integrate technology into the classroom (Carrier & Glenn, 1991).

Not much has changed over the past 20 years. Several authors and researchers have written about effective characteristics of professional development to help teacher trainers. Gess-Newsome, Blocher, Clark, Mesasco, and Wills (2003) drew across the research of several researchers and synthesized the principles of effective of professional

development, and Anderson (2004) published a list of hints for successful professional development in what was called the “Educator’s Resource Kit” (p. 36). Kanaya, Light, and Culp (2005) conducted a study with 237 K-12 teachers. The researchers had the teachers complete a survey about the professional development training they had experienced. The survey asked about their satisfaction with the training, their judgments about how prepared they are to use technology, and their perceptions of the training goals. All of the above authors found three main effective characteristics of professional development with the most important being that the approach include individualized learning plans based on the teachers’ needs. “Professional development must be grounded in the context of the teacher’s classroom” (Gess-Newsome et al., 2003 p. 328). In other words, teachers should be engaged in meaningful and relative activities that they can transfer to their classroom (Kanaya et al., 2005).

A second important characteristic came from the article written by Gess-Newsome et al., (2003) and the study from Kanaya et al., (2005). Collaboration played an essential role in professional development. In almost all studies that involved professional growth and classroom change, the interaction of colleagues was a consistent predictor of success (Gess-Newsome et al., (2003). Teachers who worked in the same schools, grade levels, or departments and shared their knowledge and activities with the group experienced more success when they returned to their classroom than teachers who did not experience the same opportunity (Kanaya et al., 2005).

Time was the third characteristic. An intense 40-hour course over a period of three months seemed to have the longest lasting effects (Garet et al., 2001; Kanaya et al., 2005). Some other characteristics of effective staff development that were revealed in the

literature are as follows: shared on-site and off-site learning opportunities for teachers, shared success stories at faculty meetings (Technology, 2002), shared a rationale for the course and activities with the teachers (Anderson, 2004; Garet et al., 2001), and offered incentives and motivations to the teachers (Kanaya et al., 2005). While we may know what effective characteristics help to promote successful staff development, we do not know what skills the teachers use, do not use, or change once they return to the classroom.

### *Impact of Staff Development in Classrooms*

There were two studies in recent years that researched the impact of staff development training on technology integration in the classroom (Ray, 2001) and follow-up on implementation after training (Reichstetter, 1999). Ray (2001) used a qualitative study to investigate the impact of staff development training on technology integration in secondary school teachers' classrooms. The main focus of her study was to find out if teachers who took a teacher technology training staff development course at the Professional Learning Center would integrate technology in their teaching as a result of the course. The Professional Learning Center was created in 1998 in an effort to promote technology integration in the classroom through staff development. The center provided over 9,000 teachers and educators with knowledge and skills to integrate technology. Ray (2001), who had been through the training, reported that the setting for the Professional Learning Center exemplified effective characteristics of staff development. Twelve secondary teachers from four school districts representing English, science, history, and business classes were selected to participate in the study. Data collection consisted of surveys, interviews, and observations. The survey charted the teachers'

perceptions of their competency level in using technology and the importance they placed on experiences connected with technology. Ray (2001) used conversational interviewing techniques to discuss the impact of professional development in learning how to incorporate technology. She had the teachers converse about their role as a teacher, about technology, and technology training. Ray (2001) observed the teachers in their classrooms to validate their responses on the survey and in the interviews. Ray transcribed only the parts of the tape where the participants responded directly to the question. The interviews were coded and divided into categories. Code sheets were made for each participant and “trees were used to group responses into themes” (p. 49). Interview discussions were then compared to the survey and observational field notes. The results indicated that all 12 teachers made use of the skills they learned in the staff development class, and they used technology to research information they presented in their classrooms. The training helped them to create their own webpage, to design multimedia presentations, and to utilize virtual tours to enhance the learning process. However, only 10 of the 12 participants integrated technology into their teaching. These 10 teachers envisioned their roles as a teacher to extend beyond teaching just their content area. They felt responsible for teaching skills needed in life beyond the classroom context. They believed technology had an impact on the students’ lives and they wanted students to be life long learners, so they made an effort to provide creative opportunities to use technology in their classroom (Ray, 2001).

Reichstetter (1999) incorporated a quantitative study to find out if there was a relationship between the amount of technology training received and the frequency of technology use by teachers for instructional purposes. Two hundred thirty-one middle

school teachers responded to Reichstetter's (1999) self-reporting survey. The survey was "comprised of five sections: a) demographics, b) instructional practices, c) types of computer technology training received, d) frequency of instructional use of computer technology types, and e) training and support factors that may be related to computer technology implementation" (p. 75). Correlational statistics, descriptive displays, and JMP Statistical software were used to analyze the data. Descriptive displays helped to gain a clearer understanding of how frequency of technology use was distributed between teachers who had varying amounts of technology training. Spearman's Rho was used to investigate the relationship between the frequency of instructional use and the number of technology classes received. Reichstetter (1999) used a multiple regression analysis to determine which "independent variables (overall training received, teaching area, overall primary instructional approach used, primary instructional approach used with computer technology, training components, hardware/software availability, administration support, and on-site coordinator support)" (p. 93) influenced technology use. Reichstetter (1999) found that formal computer technology training was a predictor in the frequency of technology use in the classroom. However, Reichstetter (1999) also found that teaching area such as language arts enhanced the transfer of skills from the staff development course to actual classroom practice.

Based on the research over the past 20 years, other predictors of transfer of training included the characteristics of technology staff development provided by several researchers (Bailey & Lumley, 1994; Carrier & Glenn, 1991; Carrier, Glenn, & Sales, 1985; Stasz & Shavelson, 1985; Stecher & Solorzano, 1987). The above studies showed that when teachers participated in technology staff development, they integrated

technology into their classroom with more frequency and with more opportunities for the students.

### *Technology Integration*

There are two aspects of research on technology integration. The first aspect is research that shows, in general, how teachers integrate technology into their curriculum. Specifically, the second facet reviews research on how teachers integrate technology after having participated in a technology training course.

Research by Dwyer, Ringstaff, and Sandholtz (1991) suggested that teachers work through stages as they try to integrate technology into their existing curriculum. The Apple Classrooms of Tomorrow (ACOT) model documented how teachers evolved through five phases as they attempted to use educational technology. The stages included the following: (a) entry, (b) adoption, (c) adaptation, (d) appropriation, and (e) invention. At the entry stage, teachers still used traditional methods of teaching such as texts books and dry erase boards, but they tried to incorporate some computer technologies. At this stage the teachers were battling discipline problems, organizational obstacles, and personal frustration (Dwyer et al., 1991).

In the ACOT Model, the adoption stage was the second stage. The term *adoption* as used here does not have the same meaning as used in Rogers' (1995) Adoption and Diffusion Model chosen for the theoretical framework. ACOT used the term adoption as the next stage that teachers enter as they try to integrate technology into the classroom. At this stage teachers were trying to figure out how to use technology in their daily activities. A teacher-centered classroom still existed, but students were learning how to use technology. Most of the work was word processing or skill and drill practices.

Adaptation was the third phase of the ACOT Model. During this stage traditional classroom practices still dominated the classroom setting, but 30-40% of the school day was spent using computers in some way, such as, word processors, databases, graphics, or computer-assisted instruction. There was increased productivity as students produced better quality work in less time.

During the appropriation stage, teachers achieved a greater sense of confidence with using technology. Teachers began to understand the usefulness of technology and began to create innovative teaching strategies. There were more project-based activities with collaboration between students and teacher.

The final stage of the ACOT Model was the invention stage. A constructivist approach to teaching was more evident as teachers began to experiment with a variety of technology and used portfolios as assessments. The roles of the students and teacher changed as students became more of an expert to help their peers.

The ACOT Model was an important contribution to the research field. The study not only explained how teachers' pedagogical practices might change when they begin to implement technology, but the study also stated the obstacles that teachers might face at each level and how to overcome them.

Marsh (1992) evaluated the outreach program of an ACOT teacher development center. The Outreach Program was an extension of the ACOT Model and was designed to encourage teachers to integrate technology into their curriculum. Early in the school year ACOT provided a list of teachers who would be participating in the ACOT Outreach Program. Principals from 13 elementary schools were contacted and asked to nominate teachers to participate in the study. Twenty-six teachers agreed to participate in the

study. Marsh (1992) used both quantitative and qualitative methods for her study. She started with a survey that was given as a pretest and posttest to determine if there was a significant increase in the number of times per week a computer was used in the classroom. Marsh (1992) found the increase in computer usage by teachers following participation in the outreach program to be significant. The teachers and students used computers for word processing, spreadsheets and databases, hypercards, and games. The second hypothesis dealt with successful implementation of technology. The teachers and raters felt that teachers were implementing technology successfully.

Four middle school English teachers who used technology in support of their teaching participated in Hughes' (2000) qualitative study. The four were selected after a phone interview and all described themselves as using technology for more than just drill and practice. However, none of them taught in technology-rich or resource-rich schools.

Hughes (2000) felt that the ACOT model was not helpful to the universal population of practicing teachers because the research was conducted within contexts that were too general and because the ACOT model implied that teachers do not skip stages nor can they enter at a stage other than the first one. Another problem when trying to generalize was that the ACOT classrooms were technology rich and teachers received extensive support from a professional ACOT staff (Sandholtz, Ringstaff, & Dwyer, 1997). Over the two-year period most of the teachers reached the last two levels within their subject areas. To apply the generalization from the ACOT teachers' experiences to those of teachers in less technology-rich classrooms was erroneous. Hughes (2000) found that, "It is unreasonable to believe we could create similarly rich learning contexts for large numbers teachers nationwide" (p. 19).

Hughes (2000) suggested a different approach to technology integration. Instead of teachers moving through stages, she believed teachers used technology across categories and not necessarily in any particular order. The categories consisted of technology as replacement, technology as amplification, and technology as transformation. Technology as replacement was replicating an already functioning instructional method. For example, students underlined parts of speech with a pen and paper, or they used the computer to highlight the word. Another example was having a poster hung on the wall with a poem written on it, or having PowerPoint looping a poem on an LCD projector. There was no change in instructional methods, student learning, or curriculum goals. The teachers in Hughes' (2002) study used technology across the categories as mentioned above throughout the study.

In technology as amplification, the technology amplified current instructional practices. Increased efficiency and productivity were major effects. Reinking (1997) described amplified technology as technology that helped the classroom do what it has always done, but better. For example, by creating a test on a computer, the true-false part could be in section I and the multiple choice part in section II. By cutting and pasting, the two sections could be switched, making different tests to hand out. This did not affect student learning, just teacher time. Another example was using ProQuest for student research. Instructional methods and content were not impacted, but the learning process was potentially enhanced by using a web-based resource for journal articles (Hughes, 2000).

Using technology as transformation renovated the instructional method, students' learning, and/or the subject matter. The instruction, the learning process, or context was

fundamentally changed from the way it was before technology was introduced. An example would be writing a hypertext story or inviting peer collaboration through email (Hughes, 2000). By following Hughes' (2000) categories, teachers could use all three of these methods on any given day all at the same time or work with only one category through the school year. Teachers could incorporate very basic principles of using technology to make significant differences in the classroom.

*Electronic Learning* conducted a nationwide survey on technology integration (Siegel, 1995). The survey was also posted in two sister magazines—Instructor and Middle Years. Those who read these magazines were people who designed technology staff development programs and those who attend them. Sixty percent of the respondents mentioned the importance of integrating technology into the curriculum. Sixty-six percent reported that staff development focused more on hardware and software training than on how to use technology in the classroom. Only 21% of the courses focused on computer integration.

A 1999 research article by Ertmer, Addison, Lane, Ross, and Woods stated that there was more to understanding technology integration than just knowing how often teachers use technology. Their study examined technology use in relation to the curriculum. Their research questions asked if technology was used to reinforce skills, enrich current topics, or extend topics beyond their current level. The findings indicated that teachers use computers from infrequently to daily. One teacher set aside 1 ½ hours per week, but often used the time for field trips or reading. Other teachers let students use the computer when all other work was done. For some, computer use was a choice of activities; for others the computers were used for instructional games or an informational

CD-ROM. Some teachers used the computer as a reward for finishing work. The computer was seen as an incentive, but not a teaching tool. The computer was used during playtime or when weather outside was bad. If a child did not get a turn, the teacher did not see the situation as anything they had missed. Although the teachers felt technology was important, they did not see the relevancy to the designed curriculum that they are obligated to cover (Ertmer et al., 1999).

Ginsberg and McCormick's (1998) survey of 1,163 teachers in both highly effective and less effective middle and elementary schools, found that computers were not changing the classroom environment very much at all. "Never" was the most frequent response when teachers were asked if the computer was used in their subject areas of science, social studies, foreign languages, and art/music. For language arts and mathematics the most frequent response was "Often." However, when students were allowed to use a computer, the activity usually involved skill and drill practice and once in a while students were allowed to type a paper using word processing software. The findings supported that computers were being used in uncreative ways and not integrated into the curriculum (Ginsberg & McCormick, 1998).

Few studies have looked at technology integration after training, and those studies that have researched computer use following training have similar findings. These studies have used quantitative, qualitative, or mixed methods, and they have also looked at different grade levels, but still come to similar conclusions. Blankenship (1998), Marsh (1992), Martin (1990), and Reichstetter (1999) found that the amount of computer usage by teachers following participation in a computer training class was significant and the more workshops in which the teachers were involved, the more likely they were to

integrate even more technology. Blankenship's (1998), Marsh's (1992), and Reichstetter's (1999) studies were described in detail earlier in this chapter.

Martin's (1990) study was conducted in Alabama. The University of Alabama/Livingston University Teaching In-service Center was responsible for carrying out workshops for teachers in the Alabama school systems. There were 512 secondary teachers registered for one or more computer training workshops during the time of the study. Surveys were mailed to the teachers and 218 were completed and mailed back. Martin (1990) found that teachers who participated in the in-service workshop were more likely to integrate computers into their daily activities, and the teachers used computers more frequently after attending the workshop. However, a limitation of the study is that the method of data collection was a self-reporting survey. The researcher did not observe the teachers integrating technology.

Reichstetter's (1999) study was a little more detailed in that the study looked specifically at 11 types of computer categories including the following: word processing, desktop publishing, graphics, multimedia, spreadsheets, databases, telecommunication, Internet, web design, programming, and subject specific software. In all but programming and web design, Reichstetter (1999) has found a relationship between the frequency of computer use and training received. Blankenship (1998) studied teacher demographics and found that training was the most common predictor for integrating technology in the classroom. The study closest to this one is Ray's (2001) qualitative study at the high school level. The 12 high school teacher participants had similar characteristics and views. They all valued technology, were comfortable using technology, helped those less experienced with technology, enjoyed staff development

courses, were committed to learning, and were willing to change their teaching methods to make the subject matter more relevant to the students. The staff development training they received had a significant impact on their comfort level and the teachers made use of the skills they learned in the class. This led to improved teaching. Although these studies showed that technology was being used in the classroom, we still do not know what technology skills teachers take from a state-mandated technology professional development course as they try to implement the skills in their classroom to fit their needs.

### *Technology and Literacy*

One important goal of school has been to teach language and literacy skills. Technology has affected the way English language arts teachers approach the teaching of literacy (Young & Bush, 2004). Teaching literacy skills is more difficult because the definition of what literacy means is constantly changing (Leu, 1997). As Bruce and Rubin (1993) explain:

“Literacy” is a term with many meanings. Across historical, institutional, cultural, social, and political contexts it has meant, at various times, the ability to sign one’s name, knowledge of the alphabetic principle, completion of a specified number of years of schooling, passing a multiple-choice test, the use of reading and writing in daily life, or the ability to function in a modern, technological society. (p. 10)

Sometimes being literate is synonymous with being educated or being able to face the challenges life provides and navigate through them (Cunningham, 2000). Wilhelm (2000) asserted that literacy is about using the most powerful technological tools to create

and communicate meaning. At the present time, those multimedia tools include video, graphics, sound, and traditional texts converted into hypertext format.

Other terms for describing literacy have also been used. In the past, functional literacy was how people interacted with print from the environment. They could be reading a newspaper, train schedule, or government documents. Today the definition of functional literacy extends to technology literacies (Valmont & Wepner, 2000). There is much disagreement as to what technology literacies should be because there is such a broad spectrum to include in the definition. In general, the definition of technological literacy “includes knowledge about computers and software applications, the capability to use the tools and materials of technology, and preparation for life-long learning in a technological world” (Deal, 2002 p. 17). Technology literacies also include the Internet as most businesses reference an online address, radio and television advertisements suggest that listeners go to a website for further information, and stores have 24-hour service when ordering online (Valmont & Wepner, (2000). Leu (2002b) explains:

The nature of literacy and learning is rapidly changing as new technologies for information and communications such as the Internet appear, providing us with new challenges and new opportunities as we best consider how to prepare children for their futures. In fact, there is one thing that is certain in these uncertain times, it is that the technologies of information and communication will regularly and rapidly change, redefining what it means to be literate. (p. 1)

Regardless of how literacy has been defined, the term shares three commonalities: “the ability to engage in some of the unique aspects of reading and writing, contextualization

to some extent within the broad demands of society, and some minimal level of practical proficiency” (Cunningham, 2000, p. 65).

Because of changes in society, the need for students to become effective users of language and communication in a technological world challenges language arts teachers to embrace a wider range of literacies (Adams, 2000) and to work with different texts and media, especially since the definition of literacy is constantly changing. The skills that students will need to master in the future are quite different from the past. Students will not only need to learn new technologies, but they will need to obtain information quickly, sort through large amounts of information, read critically by analyzing and synthesizing the information, work collaboratively with classmates, and communicate or present their findings. In 2002, the International Reading Association issued the following statement regarding the future of technology and literacy:

To become fully literate in today’s world, students must become proficient in the new literacies of information and communication technology.

Therefore literacy educators have a responsibility to effectively integrate these technologies in the literacy curriculum in order to prepare students for the literacy future they deserve. (p. 2)

Therefore, the challenge to prepare our students for literacy in the future rests on the educators as well as teacher education programs.

Due to the 1996 standards for language arts classrooms and Georgia Housebill 1187 (the new technology competency requirement for teacher certification), language arts teachers must integrate technology into the classroom. For example, the technology used can be word processing, electronic mail, or CD-ROMs. At the same time, students

are often quite proficient in technology use before entering the language arts classroom. Many kindergarten children arrive at school with technology experience (Valmont & Wepner, 2000). Most high school students have either grown up in an environment where they have had access to computers at home or they have been introduced to technology literacies from business education or computer teachers. There are, however, some students who have not had these opportunities. In addition, any use of technologies alters how language is produced, distributed, accessed, and understood (Snyder, 1999a). Therefore, language arts teacher must teach multiple literacies (Bruce, 1997).

The changing demands of modern society require students to learn new language skills, knowledge, and the ability to think critically. In order for students to acquire higher order thinking skills and learn new skills, students are expected to master new literacies. This in turn necessitates language arts teachers to be trained to tackle that responsibility (IRA, 2002). These literacies vary depending on the task at hand. They could involve writing and giving a book report, conducting a science experiment, or having a conference with a teacher. Many aspects of these activities are affected by the technological environment in which society is based (Bruce, 1997). For example, by using technology, students have new ways of communicating and producing reports for their language arts class. In the past the process of adding images to documents was laborious. Today, students can create reports with images, borders, and other graphics (Thakkar, Hogan, Williamson, & Bruce, 2001).

The Internet offers high school language arts teachers an opportunity to exploit a medium that has impacted our nation as a whole (Moore, 1996). With this vehicle come both challenges and advantages. Through the use of the Internet and CD-ROMs, students

have vast amounts of information at their disposal in mere seconds. Teachers are challenged to guide students' learning through electronic information environments that are more complex than traditional printed materials (Kinzer & Leu, 1997). As students begin to navigate the Internet, they need support to learn how hypertext works in comparison to traditional texts. Therefore, teacher preparation programs should include use of the Internet (Leu, 2002b).

To illustrate the nature of this challenge, language arts teachers need to help students understand the different reading strategies needed with traditional texts as compared to hypertext documents. Traditional texts are linear and follow a sequential order from page one to the end. Hypertext uses links which allows the reader to use links to jump from one topic to another. Some say that using hypertext environments, instead of traditional settings, can foster deeper understandings of difficult subject matter (Spiro & Jehng, 1990) and students enjoy reading and writing with hypertexts (Kaplan & Moulthrop, 1991) because "they have greater control over the information they read and the sequence in which they read it" (Charney, 2001, p. 88). However, Charney also feels that many readers do not know what information they need or in what order to read the text; therefore, using hypertext burdens the reader.

Additional challenges may occur. Many times the material is irrelevant to the reader or the reader becomes overwhelmed by the number of links and loses track of where he has previously visited and where he needs to gather more information. Another challenge is when a reader reaches a sentence with no prior information, he must fall back on prior knowledge or infer some link to the rest of the text. Working from assumptions is often difficult for a reader (Charney, 2001).

Kinzer and Leu (1997) offer suggestions on meeting the challenges of the hypertext environment. They propose that hypertext has two advantages that help the reader with no prior knowledge. The first is that the reader can continue to click on links associated with the first topic and seek out specific information, and the second is that the reader has multiple sources of information at his disposal. Not only is traditional text written on the website, but there is graphic information, speech, animation, video, and sometimes simulations available.

An advantage to on-screen text is that hypertext is often seen as more flexible because there are no boundaries as there are in traditional reading books because they are physically bound in a sequence. Hypertext is also seen as more social and open to the public because anyone walking by can stop and view the computer screen (Constanzo, 1994).

Another positive trend is that hypertext can facilitate the writing process. Hypertext allows the writer to place his material on the Internet and lets the reader select what is important. Charney (2001) says these “notecards” can be sorted and arranged by the reader as he sees fit. This is similar to placing manuals or reference material on-line. The novice or expert can choose the appropriate level for his or her purpose. The information is tailored to the individual without having documents regimented into a sequence.

Using hypertext material also requires students and teachers to be critical consumers of information. Having digital literacies enables students to discriminate between the presentation and design of the website and the quality and content of the site as some websites have hidden agendas. These literacies also enable students to use the

information provided in the website effectively (Labbo, Reinking, & McKenna, 1998; Murray & Kinnick, 2003). Being digitally literate may mean that students must use multiple sources of information and evaluate each one for trustworthiness by investigating and establishing the author's credibility (Many, 2000).

McEneaney (2003) conducted a quantitative study on adult college students reading traditional printed material and hypertext material. The first question asked if readers in general have greater difficulty reading with hypertext than with traditional print. The second question in the study focused on what, if any, disadvantages less able readers might encounter. Ninety freshman students attending a medium-sized Midwestern public university took the Nelson Denny Reading test, which is a standardized test for reading achievement. The results ranged from high to low ability reading groups. The experiment included two versions (print and hypertext) of an undergraduate advising handbook which was used to assist teacher education students in their academic planning. Students read the material and responded to questions using each version of the handbook. McEneaney (2003) found a significant main effect for the version of the handbook. Subjects found the hypertext version more difficult to use than the traditional printed version. This was clearly evident by the scores that the students received on the question they answered. However, there was no evidence that hypertext disadvantages less able readers.

In summary, literacy and computers are no longer perceived as separate entities, but are intertwined and dependent on one another (Snyder, 1999b). Accordingly, Leu (1997) suggests that language arts teachers teach students how to learn the new technologies of literacy. Learning how to learn when literacy is constantly changing will

be an essential skill for students. As old technologies are replaced with new ones, students will need to become life-long learners so that they are not left behind (Deal, 2002; Leu, 1997).

### *Technology in the Language Arts Classroom*

Many teachers see the computer as a multipurpose tool (Sheingold & Hadley, 1990). These teachers take multiple approaches to how the computer is used in their classrooms. Sometimes the computer is used solely by the teacher as an instructional tool or for demonstrations. Other times, students will use the computers individually or collaboratively. The software used may be applied to create something new, to remediate, or to enrich.

Becker (2000) conducted a large quantitative study which was comprised of more than 4,100 completed questionnaires from teachers and principals from more than 1,000 schools. The teachers sampled were from grades 4-12 in all subject areas except physical education and special education. At each school, three elementary teachers and five middle and high school teachers were selected to participate based on the principal's acknowledgement of those teachers being exemplary teachers known for their participation in educational reform. The teacher participants completed a survey booklet which was 21 pages in length and required 60-75 minutes to complete. Questions asked were about teaching practice and teaching beliefs. The results indicated that English teachers were the most likely candidates to use computers on a regular basis with their students. English teachers were interested in having students express themselves in writing and would use various software programs to assist them. Some of the most frequently used software included presentation software, email, multimedia authoring,

word processing, CD-ROM reference, graphics, browsers, databases, simulations, and games.

In a semester of action research, Traubitz (1998) incorporated technology into her high school English class. All writing assignments were word processed, desktop publishing assignments required graphics, group presentations demanded hypertext, and scanners and digital cameras were used throughout the course. Results indicated that class attendance improved, class attentiveness and retention of information increased, grades improved, and students admitted that they enjoyed the assignments. Karchmer (2001) found that high school language arts teachers used the Internet quite often, but worried about the appropriateness of some of the sites. The teachers wanted to promote appropriate and safe use of the Internet and to teach skills to evaluate the information that was found. Some of the teachers in the study also had their students publish their work on the Internet. Teachers felt this led to higher motivation and better quality work.

Although many studies found that teachers implemented technology on a regular basis, Adams (2000) and Peck, Cuban, and Kirkpatrick (2002) disagreed. Adams (2000) selected five secondary school English teachers from her district to participate in her qualitative study. In the interviews the teachers told stories that illustrated reasons for skepticism and indifference toward using technology in the classroom. The teachers shared some success stories and other stories of barriers that challenged them when trying to integrate technology in the classroom. In the end Adams' (2000) found only one in five teachers professed to use technology in the classroom on a regular basis. One teacher felt that the students already knew how to use technology so she did not have to

use technology in the classroom. The other three used technology sparingly, depending on what objective they were trying to meet.

Peck (et al., 2002) investigated technology use in two high schools in Silicon Valley (the world capital of high-tech industry) over a year's time. Quantitative data were collected to determine what types of technology teachers and students used and how they used the technology throughout the school day. The researchers shadowed 12 students for a full school day and observed 35 different teachers. Only eight of the teachers had students using computers. Those that were incorporating technology into the school day had the students typing papers in word processing programs or conducting Internet searches. In general, the researchers found that the majority of students have school experiences similar to those of students fifty years ago. Technology did not have any impact on these students' learning.

Several researchers have attempted to provide a framework for language arts teachers to help them integrate technology into the classroom (Pope & Golub, 2000; Swenson, Rozema, Young, McGrail, & Whitin, 2006; Young & Bush, 2004). First, in 2000, Pope and Golub developed seven principles for language arts teachers to follow as they attempt to infuse technology into their classrooms. The bulleted list shows the seven principles, and then an explanation of each follows:

- introduce and infuse technology in context;
- focus on the importance of technology as a literacy tool;
- model English language arts learning and teaching while infusing technology;
- evaluate critically when and how to use technology in English language arts classrooms;
- provide a wide range of opportunities to use technology;
- examine and determine ways of analyzing, evaluating, and grading English language arts technology projects; and
- emphasize issues of equity and diversity. (p. 90)

The first principle states that technology should naturally support the language arts content area. “Teaching and English language arts is our goal; technology is a means by which to reach that goal” (p. 91). The second principle reflects not only a vocabulary shift, but a thinking shift as well. Words that were once used in everyday language such as *window*, *files*, *menu*, and *mouse*, now “have new meanings and mental images” (p. 91). There is now an expanded view of what *text* is. The Internet, hypertext documents, and web sites are different kinds of text with their own characteristics. Technology has also impacted writing as students now use computers instead of paper and pen to compose. Pope and Golub stress the importance of English teachers’ addressing these literacy shifts. The third principle emphasizes the need for the language arts classroom to become learning centered and learner centered with both the teacher and student learning from each other where the teacher can also act as a facilitator. The importance of the fourth principle is to help teachers decide when to use technology. For example, instead of conducting class discusses through email responses, a teacher might insist on face-to-face communication. There are advantages and disadvantages to both, so it will be up to the teacher to decide if using technology will most effectively reach the curriculum goals. Principle five states that teachers should provide different kinds of experiences for students when using technology.

Students can create web sites, ‘read’ the Internet, participate in online discussions (ListServes, real-time chat rooms, asynchronous discussions, videoconferences), and use all kinds of writing and processing skills on computers (create texts, add graphics, and pictures, determine appropriate formats, revise extensively, and edit). (p. 94)

Principle six is self-explanatory. English language arts teachers must find ways to evaluate the students' progress through the quality of the work and the completed project. The last principle states that teachers should meet the needs of all students regardless of their differences. Pope and Golub emphasize that “teachers and students will be learners together” (p. 95) and that students will participate in their own active learning.

Young and Bush (2004) expanded on Pope and Golub's (2000) framework. Their framework focused on the needs, goals, students, and classrooms of the language arts teachers. First, teachers should understand that technologies are tools to enhance their curriculum goals, not a means in themselves. Similar to a carpenter who chooses the right tool for a specific task, teachers should encompass the same decision making strategies in selecting the best tool to achieve the desired curriculum goal. When teachers figure out the important goals, they should ask themselves questions about the use of technology. For example, “will this use of technology enhance the conversation in the classroom? Will it validate the work of the classroom? Will it validate the individual? Is it worth the time and effort?” (Richards, 2000, p. 38). Young and Bush (2004) suggested that teachers “use their answers...to be proactive in preparing to teach with technology and as a way to flesh out an informed plan for doing it effectively” (p. 11). By answering those types of questions and making the best choices for effectively integrating technology, English teachers can create beneficial learning experiences for students.

Swenson, Rozema, Young, McGrail, and Whitin (2006) commented that the previous researchers provided important insights into effectively integrating technology into the language arts classroom; however, the challenges that the teachers face continues

to grow. Building on the previous researchers, Swenson et al. organized their beliefs into four major focus areas: “Newer technologies v. newer literacies, The influence of newer technologies on theories informing our thinking about text, language and literacy, Composing with multimodal and multimedia technological tools, and The political, economic, and socio-cultural influences operating under the practice of new literacies with new technologies” (p. 9). The first focus area deals with what English teachers must consider when deciding to integrate technology into the classroom. English teachers should decide what is benefited or gained by integrating technology into the classroom and then decide what the detriment is to integrating the technology. The second belief focuses on the influence of technology on definitions of *text*, *language*, and *literacy*. “Digital texts possess characteristics that are unique to digital medium, challenging our ideas about what texts are and how they work” (p. 13). Digital texts allow the reader to click on hyperlinks and to branch off into different pathways so that the reading is non-linear. The reader now has access to video and audio to enhance the meaning making. The third area focuses on writing instruction, stating that it must “incorporate and accommodate new and emerging technologies” (p. 17). The writing process is no longer linear. Multimedia technology now makes use of hypertext and interactive reading; therefore, language arts teachers must be prepared to teach a more complex approach to the writing process. The last area of focus deals with political, economic, and socio-cultural influences on the language arts classroom. Issues of gender, race, class, ethnicity, and access to technology are areas of concern that need to be addressed as teachers try to integrate technology.

Together these researchers offer several suggestions to help English language arts teachers integrate technology into the classroom. As newer technologies and newer challenges arise, there will need to be more research helping language arts teachers with this task.

### *Teacher Perceptions*

How teachers perceive technology could influence the amount of computer use in the classroom. “Across three of the four categories of [computer] use, teacher beliefs about the importance of technology for teaching was the strongest predictor of the frequency with which technology is used for a given purpose” (Russell, et al., 2003, p. 302). Bruce (1997) described language arts teachers as being somewhere along a continuum in regards to their stance towards technology and how technology fits into the reading and writing process. The seven stances that language arts teachers may develop as they try technology in their classroom begin with a neutral position in which the teachers see no advantage or disadvantage to integration. The other stances include stages of opposition, using technology, being skeptical about technology, believing that technology transforms and provides opportunities for creativity, until finally the transaction stage is reached where technology and literacy are intertwined. For a detailed listing of Bruce’s seven stances see Appendix B.

The differences among the stances signify much more than just a slight difference. The stances not only suggest dissimilar views of technology and literacy, but also diverse conceptions of language, education, and values. The stance that the teacher adopts will determine how technology is used and what the curriculum goals are. The stance that the teacher embraces shapes the literacy studies and literacy practices in the

classroom. “In fact, it defines to a large extent the very purpose of literacy” (Bruce, 1997, p. 292).

How teachers perceive technology will be fundamental in determining how technology will be used in the classroom. Those who see technology as an add-on may not benefit from seeing changes in the classroom structure. However, teachers who use technology as a multi-purpose tool for both teacher and student activities may create rich opportunities for learning to occur.

### *Summary*

The study is situated within Rogers’ (1995) Adoption and Diffusion Model which posits that teachers will judge the use of technology based on their perceptions of five attributes. Those attributes include trialability, observability, relative advantage, complexity, and compatibility. Professional development can provide teachers with the resources needed to effectively integrate technology and provide the resources to judge the technology based on the five attributes.

A review of the research indicated that language arts teachers are expected to integrate technology and to consider how technological advances are creating new literacies. With technology changing the definition of literacy, language arts teachers are embracing the need to incorporate technology in their lessons; however, the uses tend to be lower level skills. As these teachers take professional development courses to help them implement technology, research suggests that teachers move through stages as they learn to use technology in their classrooms. What is not clear, though, is what the language arts teachers implement or the reasons why they are reluctant to implement new

technologies from professional development courses when they get back to their classrooms.

## CHAPTER 3

### METHODOLOGY

This section describes the design of the study, the participants of the study, the procedures for collecting and analyzing data, the role of the researcher, and the method for establishing rigor. This study focused on high school language arts teachers as they attempted to integrate technology in the classroom after taking a state-mandated technology professional development course. Specifically, the following research questions were addressed:

1. In what ways do high school language arts teachers integrate technology into their existing curriculum after having participated in a professional development course focusing on technology?
2. To what extent are these practices representative of the experiences addressed in the professional development course?
3. What are teachers' perceptions of technology integration in the language arts classroom?

#### *Design of the Study*

This study was conducted within an emergent qualitative research design. Specifically, this research involved case studies of high school language arts teachers who completed a state-mandated technology professional development course and were integrating technology in their classrooms. A case study design was used for “in-depth understanding of the situation...the interest is in the context rather than specific variables,

in the discovery rather than confirmation” (Merriam, 1998, p. 19). Used in education, a case study can influence policies and procedures or classroom practice (Merriam, 1998).

Three case studies were conducted in order to gain an in-depth understanding of how high school language arts teachers used the technology strategies they learned in a professional development course and applied technology in their classrooms. Therefore, the case study methodology was appropriate in part because there was a limited number of high school language arts teachers who have taken TAFT. Also, because case studies are full of intensive, rich “thick” descriptions of a single entity with boundaries (Merriam, 1998), by using case study methodology, I was able to create a complete picture of what teachers experience as they implemented technology into their classroom after they took a state-mandated technology education course. Finally, case study methodology was chosen for its “uniqueness, for what it can reveal about a phenomenon, knowledge we would not otherwise have access to” (Merriam, 1998, p. 33).

### *Context*

Due to legislation passed in the state where the study took place, all teachers in this southeastern state were required to demonstrate mastery of several computer components by the year 2006. Teachers who did not meet the technology requirement would not have their teaching certificate renewed. Teachers had three options to receive credit for this mandate. They could pay to take TechPrep (pseudonym) at a local college or university, they could enroll in a state approved course such as TAFT that was held at their local school, or they could work independently and create their own portfolio to document their proficiencies.

The professional development course was created “as an effort to promote staff development that would encourage technology integration through effective, innovative teaching” (Ray, 2001, p. 55). TAFT was offered at almost all high schools in this system during various dates and times between the years 2000 and 2006. Teachers enrolled through a computer program on a first come first serve basis. Participants were required to attend all 15 classes over a 15-week time period, each four hours in length in order to receive credit. As part of the course requirements, teachers created three lesson plans and demonstrated knowledge of an online gradebook program, attendance program, Excel, PowerPoint, Word, web design, desktop publishing, Internet research, Email, and assessment.

This particular TAFT class was school-based. School-based learning allowed teachers to work together with other teachers from their own school and perhaps their own department, work on equipment on which they were familiar, and use software that was available to them. All teachers who enrolled in the classes were grouped together regardless of their subject area. Teachers with minimal computer skills and those who were proficient in programming and web design were grouped together in the class. The TAFT instructor, a technology specialist, was responsible for pairing less proficient teachers with those who could assist them. Teachers who experienced difficulty in the class could meet with the instructor on an individual basis when needed. The spring 2004 class included teachers from language arts, social studies, math, science, and the guidance department. The initial participants for this study were members of this group.

The following list includes the seven components that the teachers learned, created and mastered in order to pass the class:

1. Desktop Publishing for Instruction. Teachers had to create two of the following examples – brochure, flyer, banner, word processing lesson, invitation, letterhead, syllabus, or newsletter.
2. Research & Media for Instruction. Teachers had to create both of the following examples – research project/lesson organized around use of the Internet or other electronic media and search results from the county’s online resources.
3. Communication. Teachers had to create two of the following examples – documentation of parent contact via email, parent communication via the Internet, documentation of student electronic communication, participant generated email with attachment, or documentation of parent/community activity to share student technology work samples or email-based projects used by students.
4. Presentation. Teachers had to create slide show of a minimum of five slides with text, graphics, sound or animation.
5. Spreadsheets/Databases. Teachers had to create a lesson plan for the Jefferson County Academic Knowledge and Skills (AKS) Lesson Plan Database and choose two of the following examples – electronic gradebook, spreadsheet used in a lesson, spreadsheet created from inventories or budgets related to a job assignment, data tables or graphs of longitudinal data of student achievement, teacher created database, database used in lesson, or reports created by SASI/Class XP/Data Warehouse.
6. Web Pages. Teachers had to create two of the following examples – teacher created information web page (homework, newsletter, spelling work list, calendar, etc.), teacher created instructional web page (with specific content or links to specific content), or student created web page related to a class project or lesson.
7. Assessment. Teachers had to create one AKS item bank item and one AKS item bank test and choose one of the following – rubric for scoring technology based lesson or a checklist to track student achievement of technology competencies.

I conducted this study in a public high school (grades nine through twelve), located in an upper-middle class residential community that was situated in a suburban area outside a large southeastern city. The county had over 120,000 students in grades K-12. The county was predominately white; although, more minorities including Asian and Hispanic students were locating into the area. There were 15 high schools, 16 middle schools, and 52 elementary schools in the county. The public school system was the

largest employer in the county with 15,000 employees. About 7,500 of them were teachers. The fiscal year budget was near 1.2 billion (Office of Planning, 2002).

The school in which the study took place was Carthage Central High School (pseudonym). The school resided on a seventy-acre campus and opened its doors 10 years ago. Last year the school housed approximately 4,100 students with 239 teachers and approximately 100 support staff. Teachers had access to 10 computer labs. Four labs were subject area labs, there was one productivity lab, two were mobile labs, and there were three areas in the media center that housed computers. In each teachers' classroom there was a television and VCR mounted to the wall. Each teacher was issued a laptop and a printer for the classroom. Teachers were encouraged to take their laptops home. Each classroom also came equipped with a desk top computer for student and/or teacher use. Teachers could check out a variety of technology from the media center.

There were six technology specialists in the school building. There were two Technology Support Technicians (TST), two Local School Technology Coordinators (LSTC), and two media specialists as well as other support staff. The TSTs assisted teachers with hardware issues. If teachers had trouble with their laptop, printer, or student machine, all they had to do was email one of the technicians. The technicians were also responsible for student log-ins and for keeping the several network servers working. The LSTCs were responsible for teaching the staff how to use the gradebook program (IGPro), the attendance program (SASI) and the email program, Lotus Notes. They were also responsible for scheduling the TAFT course for those teachers who needed to take the class and to ensure that teachers exported their grades in a timely manner when progress reports were due. Two media specialists were available to answer

technology questions, to assist with various media that teachers wanted to use in the classroom and to help teachers connect wires for the LCD projector. There were 13 sets of technology equipment that could be checked out of the media center for teacher use as well as individual pieces of equipment. Table 1 illustrates the sets that were available to the teachers and Table 2 illustrates the number of individual pieces of equipment.

Table 1

*Technology Sets of Equipment*

Set 1	LCD Projection Cart with speakers	Set 8	Broadcast Modular Cart
Set 2	LCD Projection Cart with speakers	Set 9	Laser Disc TV Cart
Set 3	DVD/VCR TV Cart	Set 10	Camcorder TV Monitor Cart
Set 4	DVD/VCR TV Cart	Set 11	Smartboard and Cart
Set 5	ELMO Projection Cart	Set 12	Opaque Projector Cart
Set 6	LCD Projector DVD/VCR Cart	Set 13	Theater Presentation Cart with PA system
Set 7	Overhead Projector Cart		

Table 2

*Individual Technology Equipment*

Item	Number of Pieces	Item	Number of Pieces
Boombox	2	Buzzer for Jeopardy	1
Camcorders	6	Digital Cameras	11
DVD/VCR players	16	Laser Disc	5
LCD Projectors	15		

*Participants*

Originally I invited the only three language arts teachers who were enrolled in the TAFT course during the spring semester of 2004 to be participants in the study. I was able to observe the spring 2004 TAFT course and felt that I had a connection with that particular class and the participants. However, at the beginning of the fall 2005 semester, one of the language arts teachers declined my invitation to be a participant in the study. I asked one of our Local School Technology Coordinators if she knew of another language

arts teacher who might want to participate in the study and she volunteered Amber's name. Therefore, Gavin and Ashley, two of my participants, were from the 2004 spring TAFT course and Amber was from the spring 2003 TAFT course.

Gavin was a white male who worked as a part-time teacher. His love of teaching brought him back into the classroom after retiring from 30 years of teaching experience. He taught senior English for three periods a day. His classroom approach was traditional in style with mostly lecture. Gavin had earned a master's degree in English. Ashley was white female who had just begun her teaching career and had only three years of experience. She knew as a young girl that she was going to be teacher just as her mother and aunt had been. Ashley taught sophomore college preparatory language arts. Her classroom approach was often traditional in style, but at times Ashley incorporated lessons that reflected more of a student-led orientation. Ashley was currently earning her master's degree in ESOL. Amber was also a white female, but she had been teaching for 19 years and was glad that she changed her major from theatre to education in college. She taught freshman language arts and advanced placement language arts to juniors. Amber's classroom approach was typically more student-centered, although lectures were used sometimes. Amber had a bachelor's degree and had certification in both gifted and ESOL. Table 3 shows the demographic information for the participants.

Patton (1990) suggested that qualitative research should focus in-depth on a small sample of participants. I decided to focus specifically on language arts teachers. These participants were purposefully selected based on the uniqueness of their subject area because I was interested in what technology language arts teachers may or may not

Table 3

*Demographic Information for the Participants*

	Gavin	Ashley	Amber
Age	52	25	41
Gender	M	F	F
Number of Years Teaching	30	3	19
Teaching Degree	MAT in English	Currently taking classes for M.Ed. in TESOL (Teaching English as a Second Language)	BS with Gifted and ESOL Certification
Pedagogical Orientation	Teacher Centered	Teacher Centered	Student Centered
Grade Level	12	10	11
Subject	British Literature	World Literature	American Literature

integrate taking a state-mandated technology professional development course (Bogden & Biklen, 1992; Merriam, 1998). Also, my perspective as a former middle school reading teacher made this subject area significant to me. Of equal importance was the fact that technology is transforming literacy, and in spite of advances in literacy in content areas, language arts teachers continue to bear the brunt of literacy instruction. The teachers' age, gender and years of experience was not a basis for selection, but I was open to the ways in which any personal factors may have shaped the teacher's perceptions and experiences with technology.

*The Role of the Researcher*

As the researcher I was the primary instrument used to collect and analyze the data (Lincoln & Guba, 1985). As I observed the teachers implement their technology lessons, viewed verbal and nonverbal communication and interacted with the participants through their interviews, I was rethinking patterns and categories and developing my subsequent set of questions. As the teachers' stories unfolded, I found additional data to collect, and new themes emerged (Lincoln & Guba, 1985; Merriam, 1998).

Although I was a past participant of TAFT and a researcher, I worked to ensure that my experiences did not set an agenda or influence the participants (Kincheloe & McLaren, 2000). In the fall of 2002, I was a participant in the TAFT course, and because I am a business education teacher, I thought a majority of the information would be repetitive and something that I already knew. However, I learned something new every week and I was able to develop three lesson plans and a professional website. Although all teachers eventually pass TAFT, I did not assume others would have the same success stories. There were teachers in the class who struggled with every assignment and every task. They were not able to make connections between the Microsoft Office applications and their classroom practice. There were others who were unfamiliar with how Windows worked. These teachers were able to overcome these obstacles and pass the class, but I did not know to what extent they continued to integrate technology. These observations and experiences, in part, led me to the focus of this study.

My role in this study could best be described as a participant observer. I conducted the research behind the scenes and observed unobtrusively. I used a camcorder set up in the back of the room to observe the implementation of technology lessons, and I took notes of what I observed. For the first observation, the participants introduced me and reminded the students why I was there (they all had read the student assent form), but otherwise, I did not have any role with the context of the classroom lesson. At the same time, I recognized that my presence would, in fact, impact the context as I immersed myself in these classrooms for an extended period of time in an effort to fully understand the patterns in the data.

I was qualified to conduct this research because I had been a teacher for 14 years, with experience in elementary and middle school language arts and reading. For the past six years I had taught high school business education classes. I had also already taken the TAFT course, so I was well-acquainted how teachers are taught. I was a current student at a state university in the Ph. D. program, and I had conducted a qualitative research study with teachers who used literature circles in their classroom. I also taught a literacy course with an on-line component at the university.

#### *Data Sources*

Data sources for this qualitative study included surveys, formal interviews, observational field notes, video-taped lessons, and teacher artifacts which included the TAFT portfolio and directions for the student projects. Also included in the data collection was communication through emails to clarify and supplement face to face interviews and notes that I had taken. Each of these sources is described in detail in the next section. The data sources were collected throughout the 2005-2006 school year. Table 4 on the next page shows a schedule for data collection. Data were managed in a masterfile notebook separated by colored tabs for each participant and research question.

#### *Data Collection*

Data collection began in August when I asked the language arts teachers who participated in TAFT the previous semester if they would like to be a part of this study. Two of three volunteered and signed a consent form (Appendix C) indicating that they understood my goal and the methodology of research and that they agreed to participate in the study. Amber, the third participant, was asked to be a part of the study a few days later. She agreed and signed the same consent form.

Then I handed out the survey that I revised from previous researchers based on my knowledge of technology integration in the language arts classroom (Appendix D) (Pelgrum & Plomp, 1993; Yildirim, 2000). After reviewing several different surveys, these two surveys seemed to best fit into the line of questioning I was going to ask the participants about their technology experiences, and the topics were areas identified by the literature to be relevant to technology integration (Zhao, Pugh, Sheldon, & Byers, 2002). The topics included barriers to implementing technology and teachers' competency levels when trying to integrate technology. The survey from Yildirim (2000) asked generic questions. When I revised the survey, I listed specific software and applications that I knew the teachers had access to on a daily basis. The survey from Pelgrum and Plomp (1993) was more specific; however, I changed the wording on several of the questions as I thought the teachers might have difficulty with the original interpretation, and I deleted a few of the questions that I thought did not pertain to this study. The questions on the survey enabled me to get to know my participants so an early relationship was cultivated. Through the use of this survey, I developed an initial understanding of what computer competencies, subsequent technology integration experiences, and perceptions toward technology these teachers had after participating in TAFT.

There were four parts to my survey (Appendix D). The first part of the survey gathered general information about the teachers, their experience, and their education. The second section of the survey asked the teachers about their competency level of computer use. The scale on the survey rated questions on a 4-point Likert-type scale, with 1 equaling *not familiar*, and 4 equaling *proficient*. The third part of the survey asked

teachers about problems they have had in the past integrating technology in the classroom. The final section of the survey asked the teachers to select a statement that best described their beliefs about technology and literacy (Bruce, 1997). The survey gave me a starting point to develop relevant questions that would allow me to further delve into each participant's unique circumstances.

As interviews provide insights that a survey cannot, I began conducting interviews at the beginning of the fall 2005 semester. Denzin and Lincoln (1994) suggested "The interview is the favorite methodological tool of the qualitative researcher" (p. 353). There was an initial interview, a midpoint interview, and an interview at the end of the school year. These three interviews were formal and based on questions that developed after reading the answers to the surveys and after classroom observations. Sample questions asked during the interviews can be found in Appendix E.

Formal interviews were conducted at a location and time of the participants' choice. Each interview lasted approximately 60 minutes and was audio-taped to ensure that no pertinent information was left out and so that I could have accurate transcriptions. I also took handwritten notes during each interview. I typed the interview transcript as soon as possible after the interview and contacted the participant in a brief follow-up interview for clarification. To make sure that I had interpreted interviews and observations correctly, the participants received a copy of the transcript, and I used member checks to verify the information (Lincoln & Guba, 1985).

The participants were enthusiastic about sharing their experiences with me. Each interview started on time and the teachers expressed themselves effortlessly. Very seldom did I have to probe for more of a response. They were all willing to explain in

detail whatever question I asked. They were also willing to share all of their documentation for lesson plans and projects. They offered to give me any artifact that I might need. Several times during the semester I would see the teachers in the hallway and they would always ask how the study was going and volunteer to send me an email when the next technology lesson was to be conducted. While the participants' cooperation was appreciated, as a researcher it was important for me to aware that the participants might be giving me the answer that they felt I wanted to hear or might be trying to please or impress me. Therefore, it was important for me look across the data and triangulate the sources of data to ensure I compared their statements with their practice.

As shown in Table 4 on the next page, the frequency of observations for each participant varied with respect to the frequency of each teacher's technology integration. Each teacher was asked to notify me when a lesson or project (a series of lessons lasting more than one day) incorporating technology was planned. The teachers also notified me when students were going to be working on some aspect of a project that would later involve the use of technology. All observations were video-taped and I video-taped each lesson that the teachers integrated technology into the classroom for student use. Each observation was one class period or 50 minutes in length. I arrived to each classroom a few minutes before the bell rang for classes to change. I was able to set up the camcorder on a tripod in the back of the room before the students arrived in class. For the first video-taping event, each teacher reminded the students why I was there. After that time, they carried on with their daily routine as though I were not there. Because the

Table 4

*Schedule for Data Collection*

	<b>Surveys</b>	<b>Interviews</b>	<b>Lesson Plan Observations</b>
August	Participants were selected and survey was given	Initial interviews with three participants	Initial classroom observation in the regular classroom
September			Ashley's Poem Project Amber's Calendar Project
October			Amber's Daily Planner Publisher Project Gavin's Literary Territory Project
November			Amber's Family Tradition Newsletter Gavin's Literary Territory Project
December		Mid-point formal interview with all 3 teachers	Ashley's Dante's Inferno PowerPoint Parody Gavin's Literary Territory Project
January			Amber's Short Story PowerPoint
February			Gavin's Literary Territory Research Paper
March			Amber's Career Research Project Gavin shared website regarding thesis statements
April			Ashley's Controversial Research Paper Amber's American Leaders Research Paper
May		Final formal interview	
	<b>Member Checks</b>	<b>Peer Debriefing</b>	<b>Portfolio</b>
August	All Participants reviewed the interview transcript and my data analysis and my transcript of the initial observation		Review portfolios for types of technology integration
September	Ashley and Amber reviewed my transcript of observational notes from the lessons		
October	Amber and Gavin reviewed my transcript of observational notes	Met with Ph.D. student and co-worker to share analysis and checked for biases	
November	Amber and Gavin reviewed my transcript of observational notes		
December	All Participants reviewed the interview transcript and Ashley and Gavin reviewed my transcript of observational notes	Met with co-worker to share analysis and checked for biases	
January	Amber reviewed my transcript of observational notes		
February	Gavin reviewed my transcript of observational notes	Met co-worker to share analysis and checked for biases	
March	Amber and Gavin reviewed my transcript of observational notes		
May	All Participants reviewed the interview transcript and Ashley and Amber reviewed my transcript of observational notes	Met with Ph.D. student and co-worker to share analysis and checked for biases	

camcorder was on a tripod, I had access to roam the classroom and observe the students working. On a few occasions I would ask the participants a question. For example, Amber had placed a document in her “assignments folder” for the students to retrieve when they entered the lab. This document had the directions for the day’s activities listed and Amber had a sample of a daily planner in the folder for the students to view. Because Amber was using the assignments folder, I asked her if she used her “inbox folder.” This feature allows students to drag and drop their assignments into the inbox for Amber to open and grade at a later date. Other than a few questions like this one that came up during an observation, I was a silent observer. By video-taping the lesson, I was able to go back and watch the lesson again at my leisure and write follow-up questions for the participants. Without this data source, I would have had to rely on my memory and whatever notes I took while observing.

I took observational field notes while the camcorder was running. I attempted to describe the activities and interactions that were happening. This also enabled me to write down questions or comments that I had at that moment. Then, I could ask the teacher about what I observed in the next interview. As a researcher I needed to be aware that having a camcorder in the back of the room might cause a distraction to both the teacher and the students. However, during the taping sessions I did not notice any discomfort of the teachers, nor did I observe the students trying to play for the camera. I found the students well-behaved and they acted as though the camera was not there. I observed all student lessons that teachers reported to me that they would be incorporating the use of technology. However, I did not observe every instance of technology use in the classroom. For example, each time the participants updated their gradebook or took

attendance, I was not present. Nor was I present each time they checked their county email. It was through the interview process that I learned what software and applications they used consistently. Teachers used technology as a classroom management instrument on a daily basis. The county required teachers to use a county-wide gradebook program, email program, and attendance program. I observed the participants as they used these management tools because they were deemed important by the county as TAFT set aside classroom time to go over the characteristics of each. These observations were done at various times while I was observing a technology integration lesson or before or after school during an interview. The following three tables document the number of times I observed each teacher in the regular classroom and in one of the computer labs.

Table 5

*Gavin's Initial Observation and Observations for Literary Territory Project*

	Classroom Observations	Media Center Observations
August (initial observation)	1	
October	1	2
November	1	2
December	4	
March	1	2

Table 6

*Ashley's Initial Observation and Observations for Three Technology Projects*

	Classroom Observations	Computer Lab Observations
Initial Observation	1	
Chinese/Japanese Poetry Project	1	2
Dante's Inferno	2	2
Controversial Research Paper	5	3

All participants of TAFT completed an electronic portfolio along with a notebook of various materials. The notebook consisted of notes taken during class and a check-off

list of what objectives had been completed. Also included in the notebook were teacher reflections about various technology scenarios. The portfolio included all 7 components that were met to pass TAFT. I asked the participating teachers for a copy of their

Table 7

*Amber's Initial Observation and Observations for Six Technology Projects*

	Classroom Observations	Computer Lab Observations
Initial Observation	1	
Daily Calendar	1	3
Daily Planner	1	2
Family Tradition Newsletter	1	3
Elements of a Short Story PowerPoint Presentation	1	3
Career Research Paper/Newsletter	3	5
A Nation In Crisis: Then and Now Research Paper	4	3

portfolio. The teachers also gave me copies of the directions for the student projects. I collected these artifacts because they allowed me to paint as broad a picture as possible of the different ways the participants perceived technology use in the language arts classroom. This documentation provided insight into their ability levels and interests. Review of the portfolio occurred before and after interviews and observations and was ongoing during data analysis.

This qualitative study lasted for 36 weeks or one high school year. This provided time for prolonged engagement and persistent observation that is essential to qualitative research. I began data collection with a survey and continued throughout the school year with interviews and observations. This time frame allowed me to examine the ways in which teachers integrate technology after having completed a technology professional development course. Prolonged engagement ensured that I fully understood the

participants, the context, and the factors that influenced the study. Prolonged engagement meant that I was immersed in the context of the study where I gathered enough information to establish emergent themes (Lincoln & Guba, 1985; Merriam, 1998). As a teacher in this school, I already had access and an understanding of the overall school environment. This facilitated my ability to understand the teachers' experiences within this context and within the timeframe of the school year. My use of persistent observation was evident in the way in which I used data analysis to steer further collection of data and analysis. The ongoing process of data collection and analysis was crucial to the design of the study. Persistent observation allowed me to see where emerging patterns existed or did not exist, where I needed to examine data more carefully, and where to focus my attention next (Lincoln & Guba, 1985).

I maintained a notebook to hold all documentation collected throughout the inquiry process. This notebook had sections specifically for each participant. Each participant was assigned a particular color. Gavin was purple, Ashley was yellow, and Amber was pink. All field notes and transcribed interviews were printed on the corresponding colored paper. The tabs in the notebook separating each section of information were also color-coded. The tab labels were as follows; interviews, artifacts, survey, correspondence, and field notes. All transcribed data was stored in the notebook as well as on my home computer and backed up on a CD-Rom.

### *Data Analysis*

As I read over my notes from the classroom interactions and the interviews with the teachers, I began to compare and contrast pieces of information to form categories. As new codes emerged, new categories were made, and new questions were raised. In

this particular case, the codes I used were small phrases or topic names. With more analysis came the fine-tuning and verifying the data to work towards themes. Qualitative designs are emergent in nature; therefore, the data collection was dynamic and constantly changing (Merriam, 1998). Comparisons were made with the observations from the TAFT class, the actual classroom observation, notes, interviews, and surveys. I examined the themes that emerged beginning with the first piece of data that were collected. This constant comparative method (Glaser & Strauss, 1967; Lincoln & Guba, 1985) was used throughout the study by assigning topic names to each piece of data. Then categories were revised and modified as new data was incorporated (Bogdan & Biklen, 1992). Once I reached saturation, meaning no new themes were emerging, the data collection ended.

The first person I interviewed was Amber. I printed her interview on pink paper. I reread the interview and wrote notes in the margin. The notes consisted of various topics or phrases (codes) that related to that section of the interview. I also thought that topic might come up in interviews with the other participants. I cut apart each of those codes and taped them to a poster board. Because I was cutting the interview apart, I also wrote in the left margin the interview number and page number so that I could find the information in the original transcript.

I interviewed Ashley next. I printed her interview on yellow paper. I followed the same procedure for Ashley that I did with Amber. I wrote notes in the margin and cut apart her interview based on codes. If any of the codes related to each other, I taped them next to each other or on top of each other. If a code was independent, the small paper was placed by itself on the poster board. Gavin's interviews were printed on purple paper

and the same procedure for cutting apart the interview was applied. Once I had conducted the initial interview for each of the participants, I reread the survey they completed and reread the reflections from their portfolio. Pieces from those documents were photocopied on the appropriate colored paper and taped to the poster board. Throughout the year, each time I interviewed a participant or observed a participant I followed the same procedure. Data collection and data analysis were conducted simultaneously. With each participant I looked across their observations, interviews, the survey, and the portfolio for consistency with the data. I conducted within case analysis while I was conducting cross case analysis.

I reviewed the data immediately after transcribing the source, I reviewed the data when new data was collected, and I reviewed the data each time themes or new categories seemed to emerge. I immersed myself into the data to see what additional themes or patterns emerged. I wanted to paint the most accurate description of the experiences language arts teachers face as they integrated technology. During this process data were “broken down into discrete parts, closely examined, and compared for similarities and differences” (Strauss & Corbin, 1998, p. 102). For example, when I initially began coding, there were 24 topics listed on my poster board. Some of the topics included feelings about TAFT, obstacles to technology integration, methods of student learning, and teachers’ experiences with technology. As I continued to analyze the codes, they were collapsed, expanded, combined, and separated to form categories. For example, one of the categories became technology use. Inside that category were three codes or topics. The codes included teacher personal technology use, teacher professional technology use, and student use. Appendix F shows this detail.

At this point, poster boards with cut up paper became too difficult to sort through. There seemed to be too much data. Therefore, I conducted a data reduction step and hand wrote the topics on a large poster board. The table in Appendix G is a representation of the poster board that I created.

From this point themes began to emerge. For instance, one of the original themes was barriers to technology. However, during my last interview with Ashley, it seemed more apparent that available technology sitting idle was a separate theme. Barriers to technology integration was then separated into two themes – time impacted technology integration, which later became restrictions on time impacted technology integration, and available technology sat idle (see Appendix G).

The next step in the process of coding data was axial coding. The following description is from Strauss and Corbin's 1998 book:

Categories are related to their subcategories to form more precise and complete explanations about phenomena. Although axial coding differs in purpose from open coding, these are not necessarily sequential analytic steps, no more labeling is distinct from open coding. (p. 124)

I separated the data during open coding and then reassembled the data during axial coding. I used the constant comparative method founded by Glaser and Strauss (1967) and consistently and constantly compared pieces of data to thoroughly develop categories and subcategories.

Looking within cases for the participants' stances toward technology was an important part of the data analysis process. During the first interview with Ashley I could tell that she was eager to integrate technology. However, as I was coding her interview, I

kept thinking “fearfulness,” and I wondered what impact that would have on her during the school year. Through the rest of the interviews and the observations, the same two themes kept emerging; her enthusiasm and her fearfulness with integrating technology. She was the first participant on whom I placed a label that defined the stance toward literacy and technology. Once I had a label for the first participant, the other two were fairly easy. As I reread their interviews and observational field notes, I kept asking myself, “What adjectives describe their stance toward literacy and technology?” Even in Gavin’s first interview it was apparent that he was resentful about being forced to use technology and ambivalent that he could do just as well without technology. Halfway through the study *resentful* was changed to *professional resentment*. Gavin was not resentful about technology: he was professionally resentful in being told how to run his classroom. Almost immediately, eagerness and enthusiasm came to mind when rereading Amber’s interviews. She integrated more technology than the other participants and wanted to use technology more in her class.

The final coding step was selective coding. Selective coding is defined as “the process of integrating and refining the theory” (Strauss & Corbin, 1998, p. 143). Using the categories and subcategories that emerged, I endeavored to explain the data that I collected from each participant. Reading and rereading, analyzing and reanalyzing each chunk of information was time consuming and challenging. Sometimes an idea, comment, or question would easily fit into a category. Other times, I could look at the same piece of information for weeks before I thought the information was even relevant. Eventually, I had four main categories which finally became the four cross case analysis: (a) technology learned in a staff development course was adopted into the classroom, (b)

TAFT resulted in engagement and enthusiasm for using technology, (c) restrictions on time impacted technology integration, and (d) available technology sat idle.

Originally this study was scheduled for one semester or 15 weeks from August 2005 to December 2005. However, in December, I felt that I had not reached saturation of the data. One of the participants still had not introduced his technology project, and I felt there was still more to observe and more to learn from not only this teacher, but the others as well. In May 2006, I conducted the last interview for each participant. At that time, I felt I had achieved saturation, and I ended the data collection and analysis process as I began to feel that no new categories or themes were emerging.

### *Establishing Rigor*

Lincoln and Guba (1985) have established the criteria to determine if a study is rigorous. There are four pieces of criteria – credibility, transferability, dependability, and confirmability. When the criterion is met, problems of instability and bias are reduced.

Credibility was established through prolonged engagement, persistent observation, triangulation, peer debriefing, and member checks. Table 4, the data collection table, documents my schedule of peer debriefing and member checks. I was immersed in the study in order to develop emerging themes. I did this by having weekly contact with all the participants and I observed lessons where technology was integrated into the curriculum.

Persistent observation guided the on-going process of collecting data and revising categories as the data were analyzed. This allowed me to adjust my interview questions to fit the new patterns. Persistent observation also helped me understand new emerging themes or connecting similar themes together. By beginning data analysis on the first

day of data collection, my subsequent data collection was focused by my working hypothesis and targeted what I needed to more fully understand.

As Dias (2000) argues, “No single method of data collection is completely free from validity threats” (p. 52). Therefore, I used several sources for collecting data, to enable the goal of triangulation. In creating my final themes, I looked across the participants’ initial survey, then interview transcripts, and their portfolio and contrasted their data with their actual classroom integration. In this way I was able to consider the juxtaposition of what they said, what they planned, and what they did across multiple data sources. When data are analyzed and themes emerge, credibility can be established by cross-referencing that finding with the other pieces of data.

A concern with many research studies is that of bias. A qualitative researcher recognizes that her bias will shape the collection and analysis of data. Having a peer debriefer helped to uncover any biases that I brought to the study. One university Ph. D. alumni and one colleague at my school who has already earned his Ph. D. assisted me to fulfill the peer debriefing requirement. By uncovering my own biases, I was better aware of how my perspective influenced my findings, and I could work to fully understand the data from multiple perspectives. For example, when I first began analyzing Gavin’s data, I wrote in his case study that his stance toward literacy and technology was resentful. My peer debriefer pointed out that Gavin was not truly resentful of technology, that it was more of him being professionally resentful about being told how to run his classroom. Through our discussions, I was able to see different perspectives. I was able to take my peer debriefers’ viewpoints and see the data in a different way.

Member checks were used throughout the data collection to insure that correct interpretations were made. The participants and I communicated by email or phone informally. Or, we set up a specific time to review the interpretations of the data collected. The participants were allowed to read the transcripts of their interviews and to read their case as it was developed and written for chapter 4. They also had permission to provide additional insights, comments, questions, or concerns on both sections.

Through my use of thick, rich description of the school setting, the participants, and the procedures, the reader should be able to determine transferability. Other researchers or educators can then determine if their design context is similar to this one and decide on the extent to which my findings may inform their experience.

The focal point of dependability is “on the process of the inquiry and the inquirer’s responsibility for ensuring that the process was logical, traceable, and documented” (Schwandt, 2001, p. 258). As I discussed my theoretical framework, review of the literature, how my participants were chosen, and how my data were collected and analyzed, I have documented the dependability criteria.

To achieve confirmability I left an audit trail of how I collected and analyzed the data. My system of using a masterfile notebook for data management will enable another researcher to inspect my notes on the course, the classroom lessons, or the interviews, and readily see the process I used to come to the conclusions that I made.

### *Limitations*

The study was limited to one professional learning technology course and to teachers in one public high school in a large metropolitan area in the Southeast, United States. Varying amounts of support and technology resources in particular contexts is

likely to shape the knowledge and expertise teachers gain from professional development courses and their degree of integration. Another limitation of the study involves the generalization of the findings to a larger population. The participants in this study represented three teachers from a public high school in a Southeastern state. The range of background experiences and motivation for integrating technology that these teachers brought to their classroom is likely to differ widely from other teachers, in other schools, districts, or states. An effort will be made in the next chapter to describe these personal variations to the extent that the reader can determine transferability.

## CHAPTER 4

### RESULTS

This chapter introduces the three participants of the study. All three participants integrated technology in their language arts classroom before and after taking the TAFT class. They had varying degrees of expertise with technology both personally and professionally, and they came to the classroom with their own ideas of what technology integration looked like. Each participant is first described individually in separate case studies, as it is my hope that the reader will deeply understand and come to know the participants by describing them separately. To guide the reader, each participant's background information, classroom context, use of technology, and stance toward literacy and technology will be described. At the end of the chapter the four cross case analysis themes related to technology and the language arts classroom are made apparent.

#### The Case Studies

##### *Gavin's Background*

Gavin was destined to be a teacher. He knew from the very beginning that he was going to teach. He grew up in Appalachia in a house with no indoor plumbing and no telephone. His favorite pastime was going to the public library, so his parents took him once a week to check out a huge stack of books. During his third-grade year, his teacher had a reading contest. Gavin, who was quite competitive, read everything he could get his hands on. There was one series that he remembered quite fondly. They were these

little blue biography books that were lined up in rows and they were about historical figures – George Washington, Robert E. Lee. “I read them all. They would all be about that person growing up and the final chapter would always list his adult accomplishments.” This was where his desire to be a teacher began.

At first Gavin thought he would teach third grade. By the time he entered high school, he knew his passion was for math and thought that would be a good subject to teach at the high school level. “I was always a ‘figure it out myself’ kind of person and if we had calculators back then I probably would have stayed with math. I hated to keep going back to the book to consult those table to do things because I wanted to be able to do it.” Gavin then became a history major. However, that dream, too, was short lived. His college advisor explained that finding a job as a history teacher would be difficult. At this time Gavin was studying Greek mythology and enjoying the subject matter. His advisor told him that there was a much bigger market for English teachers. On a whim, Gavin changed majors and has not looked back since – that was 30 years ago.

When Gavin first started teaching he had four different classes to prepare for, as well as being the football coach, the tennis coach, and the drama coach. After putting in his regular teaching hours, he headed to the tennis courts for practice until 7:00 pm and then arrived at the theatre for rehearsal until 10:30 pm. Gavin quipped, “If my wife wanted to see me, she would bring me dinner and watch rehearsals.” Gavin has taught in eight or nine high schools, always changing because of football coaching. Today, Gavin is retired, but he elected to work part-time teaching senior English to students on the college preparatory track. He felt that he would hang around as long as someone (the administrators) wanted him to talk to some kids. Gavin is described as a gifted teacher –

not a teacher of the gifted, but gifted in his ability to connect with students and to encourage them to learn. “Often times kids that don’t do well in my class will tell me how much they learned despite the fact that some kids don’t work very hard.”

Gavin felt that his job was to teach students to think for themselves. The county he taught in had a checklist of objectives that must be met for each subject area. He alleged that the county was too quantitative and “addresses the lowest common denominator.” He believed that instead of academic knowledge students should have academic understanding. He commented that he had emailed his colleagues about this and he said, “I’m sure they are always bugged about my little grumbles from an old man living in a cave, and I think someone said, not just a cave, but a 17<sup>th</sup> century cave.” His colleagues’ thoughts did not discourage him. He explained that “understanding is a whole lot more important than knowledge because knowledge is just knowing something; like doing well in *Jeopardy*.” In contrast to knowledge, understanding was having all the pieces of knowledge and synthesizing them, and that was what he believed we should want our students to be able to do – think. Gavin would have four academic understanding and skills, “Students will speak thoughtfully, students will write thoughtfully, students will read thoughtfully, and students will listen thoughtfully.” He wanted his students to realize that what comes out of a teacher’s mouth is not gospel. Students could disagree with the teachers as long as they thoughtfully expressed their disagreement. He has had students who knew his position on a piece of literature and they would attack his view point. “That’s great. I love it,” he said, “The whole idea of, ‘Coach, you tell me what you want me to say and I’ll say it,’ that’s vomiting on paper.” He explained that the student would get a grade for completing the assignment, but the

process of writing the paper with what the student thought he wanted to hear, probably did not advance the student's mind very much. Gavin wanted students to think for themselves and to be reflective.

### *Gavin's Classroom*

The classroom where Gavin was observed belonged to another teacher, as Gavin was what was considered a "floater." He had no classroom of his own; he borrowed other language arts teachers' classrooms when they had their planning period. Store-purchased posters and some student art work adorned the wall on the right. A wall-mounted TV and VCR hung in the right corner at the front of the room. Under the TV was a blue couch that students were allowed to sit on throughout the day. The regular classroom teacher's desk was on the left side in the front of the room. A dry erase board and table piled with books and current work is in the center as well as a podium that is used for presentations. On the far wall were two windows overlooking the front of the school and the bus lanes. In the winter when there were no leaves on the trees, the elementary school across the street could be seen. Student work was posted on the back wall. There was art work as well as handwritten and typed projects hanging in various ways on the wall. Three of the walls had desks facing the center of the room. A computer for student use was near the front of the classroom; however, the machine was never used because the mouse was missing. If Gavin had his choice, all desks would be facing front with no need for a couch. This classroom was on the senior hallway in the furthest corner of the school building. Students often came into the classroom chatting to Gavin about the highlights of Friday's football game, showing prom pictures, or discussing what happened over the weekend. On many days during the school year,

students came in with balloons announcing their birthday. Each day Gavin arrived to the classroom about the same time as the students. He set up his laptop in order to take attendance and got his materials ready while the students talked among themselves, and some to him. Once he began with an anecdote, the students quickly focused and were engaged in the class discussion. Many raised their hands with questions or comments. They were eager to hear more of what Gavin had to say. Although Gavin is retired, he was not treated like an old substitute who had come back to teach. The students called him “coach” and respected what he had to say.

*Gavin’s Use of Technology.*

Gavin was quite adept at using technology for personal use. From one of the interviews he indicated that he had an email account that he used frequently as well as several electronic devices such as a digital camera, scanner, thumb drive (jump drive), CD burner, TiVo, and cell-phone. TiVo is a digital recorder that records television shows. However, in his professional use, Gavin voluntarily used few software programs. Each day he took attendance on a program called SASI; he used IGPro to calculate grades for students, and Lotus Notes for email, all of which were county required. On his own he used the Internet and Hypersnap to find and download pictures of literary figures for his language arts class and Microsoft Word to create handouts and tests for the students. Last year he used a PowerPoint presentation to review British Literature for the final exam.

Each year Gavin required students to complete a year-long research project on a literary territory. A “territory” was the writer’s works. The students were to ascertain where within the territory they wished to focus their efforts. Students could write an

opinion about a particular book or poem or write about just a section of said territory.

The only requirement was that the students produce a 2000 word documented, researched position paper that focused on their territory. Although he took them to the computer lab a few times during the school year, he did not show them how to conduct the research.

As he said, "I just let them go." He felt that students already knew how to search for and find information. Other teachers or peers have shown the students how to conduct research before so he did not need to take the time from his class to show them. He also explained students learn about technology "...the way you learn about sex – their friends, on the street, or some kid who's really good at it and says look at this and someone looks over his shoulder and they learn like that." He chose the media center computer lab because books were also available for students to conduct research. If he were to schedule time in the language arts computer lab, there would be no other source of finding information other than using computers and the Internet. The research project needed to be completed in typed format, but Gavin did not allow class time for the students to type their papers. Gavin met with students in the morning before school if they had trouble with formatting their paper or documenting the bibliography page.

Gavin participated on the text book adoption committee the summer before this study began. After the textbooks were selected, the publisher gave the teachers software to use in their teaching, but Gavin had not used the software yet. He expressed his concern of the software hindering growth. "I think it can be a crutch and really get in the way of teachers developing knowledge and content because the machines are doing it all for you." He believed teachers should create their own tests and materials to share with the class.

*Gavin's Stance toward Literacy and Technology: Both Ambivalent and Resentful*

Based on observations, field notes, and interviews, the conclusion was made that Gavin's stance toward literacy and technology was that of ambivalence and professional resentment. In different settings, he had different reactions to literacy and technology. For instance, Gavin was ambivalent in that he demonstrated a lack of initiative in wanting to integrate technology into his language arts classroom but would use it when it was convenient. He felt technology did not add anything to his lessons and his students were just as successful when technology was not used. However, in interviews a resentful attitude was apparent as he shared his strong feelings about being told how to run his classroom. He said that county administrators were too controlling with mandating the use of technology, especially scantron achievement tests that he believed to be a cop-out and a hindrance to learning.

The following three sections, Gavin's Instructional Approach, Application of the Competencies, and Gavin's Perceptions provide documentation of Gavin's ambivalence and professional resentment towards technology.

*Gavin's instructional approach.* Upon observing Gavin, one would occasionally see him integrate technology into his classroom. He scheduled trips to the media center so the students could research their territories. He also used certain forms of technology, though they were often for his own benefit, such as SASI for attendance or IGPro to take grades, and were not shared directly with the students.

Sporadically, Gavin had the students meet him directly in the media center. They had already received their instructions for the research, so they were ready to begin researching their territory when they arrived. The students always walked quietly into the

media center and went straight to Gavin's assigned section. Some students took to the computers, while others spread their things on the tables. The students using the computers used various search engines and wrote comments on index cards. Some of the students at the tables began perusing the books on the shelf. They, too, took careful note of the information in the books they were examining. While the students worked on their assignment, Gavin proceeded to read papers and answer emails. He did not actively participate in the research process with the students unless his attention was required by a particular student. A few students had questions. He assisted them all and did not show preference to students choosing one medium over the other.

One day in late March, when Gavin's students were scheduled for research time in the media center, he had the students meet him in the classroom instead. He had found a website to share with the students and was excited about providing the pertinent information regarding thesis statements. He quickly attached his laptop to the school's network cable and started reading some examples that he had found. After taking a few minutes to answer questions, the class was off to the media center to finish researching their territory.

In an interview, Gavin said that he saw no difference in the quality of work when students used to turn in their project handwritten or if their paper was typed. He said the only distinction is that "plagiarism is much more common now because it's so easy. When students plagiarized back in the 1980s, they would have to hand copy the text which was laborious. Today, all they have to do is copy and paste."

Gavin's admitted that there were several obstacles to integrating technology into the language arts classroom. When asked to elaborate in an interview he said,

I don't think it's my lack of competence being able to do it, I think it's the fact that the equipment is not readily available and it's just too inconvenient and time consuming. Transporting kids to the computer lab takes instructional time. Even with portable labs, being a floater, the mobile lab would have to float with me.

In the teacher survey, Gavin made note that there was an insufficient number of computers available for student use, no time for students to learn about or to use computers, and no support for teachers in the computer labs.

*Gavin's application of TAFT competencies.* When discussing the technology class he was required to take, Gavin was positive in that he noted the course was a worthwhile experience. He also thought the instructors "...did a really good job." At the same time, Gavin resented the fact that he had to take the class. He said, "The instructors were engaging and I was learning information. I do resent the powers that be because I'm not real sure they really understand what they are dictating. Someone whispers in their ear that they need to require this, and so I'm being forced to take this class and master these seven components. It's almost like someone requiring everyone to paint their car the same color." Given a choice, Gavin would not have chosen to enroll in a technology class because he felt that he was adept enough at the level that he needed to be, and the use of technology in his classroom was not a necessity for him to teach his subject matter.

There were seven components in TAFT that Gavin had to master in order to keep his teaching certificate – desktop publishing for instruction, research and media for instruction, communication, presentation, spreadsheets and databases, web pages, and assessment. Some of these components were adopted directly into Gavin's room, while

he changed others to meet his needs, and still others were not used at all when he returned to the classroom.

The first component required in the technology class involved the use of a desktop publishing and word processing program. Gavin created school letterhead while in the TAFT class. He continued to use this whenever he needed to send a letter to a student or parent. He noted he was still using the document that he first created, but he could easily change the item in the future if he needed to. He also designed a flyer to advertise the marathon reading of *Paradise Lost* written by John Milton and published for the first time in 1667. He discussed that he would be doing this activity again later in the year, so he would simply update the flyer with the correct date for this year's marathon. "John Milton is my area of expertise and I will start the project in January. That's when you will really see my enthusiasm."

To document his abilities to meet the research component of TAFT, Gavin used the literary time period research project. He created this before taking TAFT and continued to use this for a project grade after the course. He did not make changes in his approach to the project as a result of the course.

In TAFT Gavin learned how to email students' progress reports home, which fulfilled the communication component in his TAFT class. He was familiar with the gradebook program IGPro but he never knew he could use it to email progress reports home before he took the state mandated course. Over the year he emailed students' progress reports to any parent for whom he had an email address. "I find that a very easy thing to do," exclaimed Gavin. He enthusiastically admitted, "The class had a whole lot

to do with it because it showed me once you get the progress report deal set up it's just a matter of hitting a button every Friday.”

Gavin developed a PowerPoint presentation in TAFT which reviewed British Literature. However, he remarked that he probably would not use the presentation this year because he was currently floating and did not have his own room. Gavin liked the presentation but he was ambivalent about using it. He commented that it would take a lot of time and energy for him to check out the LCD projector from the media center, carry the equipment with him to each of his classes and set up and then disconnect the cables in each room. He did not think the technology integration was worth such a hassle.

For certification purposes, Gavin produced an Excel spreadsheet and a teacher website which contained information about him. Currently, he did not use Excel in his class, and he had not updated the webpage for use in any of his classes. He explained that TAFT was similar to his class. “I ask these kids to write a paper. So, they write a paper and demonstrate to me that they have the ability to write a paper. It's not really a utilitarian purpose, just to demonstrate the competence in being able to do it.” He emphasized that learning a skill and applying it when warranted to various situations was what should be taught. “I did those lessons to show the instructor my competence in doing that if there were a need in my classes. I don't find a need.”

Gavin had to show mastery using both SASI and IGPro which were databases. He had used both before as they were needed for everyday administrative tasks, but he learned how to generate rosters for his classes and how to filter for students who were failing. Gavin also gained knowledge on how to randomize a list of students in IGPro. He used this tool when students had to choose their territory. He thought by randomizing

the alphabetical list of students, he was being fair in allowing the students to choose their research project topic. When IGPro sorted the students, the first name on top would be allowed to choose his territory first. All three tasks he learned in the class and still continued to use.

Gavin created a web page for the TAFT requirements, but the page was never activated. He said that he would be interested in pursuing the creation of web page for advertising the *Paradise Lost* Reading Marathon. He explained that a high school in Chicago had a web page for the marathon "...and I think that would be pretty cool too," he said. He also mentioned having a website that students could go to for help:

I've thought about how good it would be if I could advertise that there is a link to various places that they could go and help them on things. I really have not gained the expertise to sit down and do that. I don't feel confident in doing it and to be truthful, I probably do have the time since I'm semi-retired, but I don't have the drive to do it.

He thought that if someone who was adept at creating web sites sat beside him and just talked him through the process, then that would be ideal because he had some great ideas for websites such as teaching MLA style referencing and research methods.

Gavin helped his teammates create the county final exam by using the county's item test bank for the assessment component in TAFT. He continued to help with the final exam even though he told his colleagues, "It's doing the devil's work."

In summary, Gavin's application of the competencies he learned in TAFT exemplified his ambivalence towards literacy and technology which stemmed in part from his opinion that students can illustrate their knowledge of English language arts

without ever using technology. Therefore, Gavin did not use any of the lessons that he designed in TAFT, and he only used technology himself when necessary. The technology was available, but he did not find a need for technology in his classroom so he only used a small portion of what he has learned out of convenience. He commented, “It was for a dog and pony show. I don’t think I gained essential information. I learned how to decorate the car. I already had the car. I don’t like to decorate.”

*Gavin’s perceptions of technologies.* During our second interview Gavin said, I think I shared with you before my ideas about standardization and regimentation, and I think we are losing a lot of individuality. I think this thing (technology) works in both directions. I think it’s a wonderful tool if used correctly, but I think there is so much danger in it being abused, and I think it is abused by people who don’t understand that they are abusing it.

So, he saw technology as neither good nor bad, but was professionally resentful towards technology because it had become a tool for local, state, and federal agencies to interfere with his classroom and hinder his ability to educate his students in what he believed was truly valuable – the ability to think.

Gavin acknowledged the benefits of technology to teachers and the additional avenue of creativity that technology could provide, but he also was quick to point out that technology was not necessary to fulfill his job or to reach his goal with his students. He believed that technology had wonderful potential applications and that technology integration held opportunities to be creative because he could create pictures for his work. Using technology allowed him to be more innovative because there were “...really cool things” that could be done with technology.

Gavin also perceived technology integration as helpful because he felt that there were many advances with technology that helped to create time savers for teachers. Organization had always been difficult for Gavin. He used to carry note cards with anecdotes on them to share with his students. He had them “stuffed” in several places and often times he could not find the note cards. Now he created folders to keep on his desktop with these pieces of tidbits to share with his class. In our interview he also mentioned some neat possibilities that he saw with technology. He liked using the LCD projector to show students examples of the correct way to write a bibliography but would only use the equipment if it was convenient to use. He also enjoyed using Hypersnap to download visual images to use with his classes.

Although he felt that there were many benefits that could come out of technology in the language arts classroom, he said the machine was only as good as the people feeding the equipment. The machine could be manipulated for political gain, “like test scores, this Annual Yearly Progress stuff, that’s just pure political gain,” which was a negative attribute. “You can gather the data, and I think it was Mark Twain who said that there are three kinds of lies – ‘the lies, the damn lies, and statistics.’”

Gavin was professionally resentful that agencies were using technology as a tool to attempt to understand student performance and teacher accomplishments. “Scantron is a heck of a lot easier than grading essays. Having to do something that I don’t think is in the best interest of the kids, like giving our multiple choice final exam, that takes something out of me.” He said the constant interference caused by the preparation of taking measurement tests and the time of taking the tests themselves, prohibit him from teaching his students what was truly relevant; the ability to think. The agencies misuse of

technology and testing have hindered class time to the point that Gavin believed he was able to accomplish more in the 1980s than he was today:

Instruction is being killed by standardized tests. We need so many hours, so many of the things that we were able to do back in the 80's, we don't have the time to do it anymore. There is the Gateway, the Georgia High School Graduation Test, the Georgia High School Writing Test, the End of Course Tests, and the Advanced Placement Tests coming in and they are killing us. They are really being destructive.

With all the testing that the students and teachers have to tolerate, Gavin felt that his students see the scantron final exams as a joke and fears that all this testing was having an effect on young teachers because all they see are these measurements and think that is what education is all about. "We are hollowing out our intellect just when we need to be going in the other direction." With instructional time being taken away by testing, Gavin felt there was no extra time to teach students by methods other than lecture. Standardized testing required nothing more than memorization and regurgitation or as Gavin said, "vomiting on paper." He would like people to think about answers instead of just bubbling in on a scantron. He said that his students find the End of Course Tests a joke because the test was aimed at the lowest common denominator, but that was the way the government measured student achievement. This caused students to see no value in writing. He said these tests are having a negative impact on our students. The tests were created out of convenience, but they (the government, the county) "...destroy humanity for convenience sake." Data driven instruction, "how soulless is that?" Furthermore,

Gavin stated that he believed standardized testing gave parents a false sense of their child's performance and ability:

Last year the junior English teachers got the results back and the grades were so high compared to the grades the kids had going into the test, which sends really mixed signals to the parents. A parent can look at that test and say, 'Well, my kid made a 96 on this state EOCT (End of Course Test) and has a C in your class, how can that be?' Then we learned that those tests weren't scored the way we score tests. They were more like the statistical term, you know how you can miss 10 out of 50 and it still puts you at the top 5% and that's how they scored it. It might have been an 80 if we were doing it with the mathematical average. The way they were doing it made it a 95.

Gavin also perceived technology to have an oppositional relationship with literacy. The term oppositional comes from Bruce's (1997) stances and is found in Appendix B. Bruce (1997) stated that those from an oppositional stance are resistant to technology. "For them, the inevitable uses of technologies for surveillance, regimentation, and social stratification far outweigh the alleged benefits" (p.290). To argue further, many from this stance fear that a technologically advanced society will destroy humanity. In an interview with Gavin, he emphatically stated,

Regimentation is a scary, scary thing to me. I just see us lock step marching into the future and there is so many science fiction themes about the machine taking over. Although I don't have that as a fear, I think we are allowing the machines to make us machines. I would like people to think about answers instead of just bubbling, but the machine demands bubbles, so bubble we will. I think we are

starting to see, after talking with colleagues, an impact on our kids. That they are seeing no value in writing because it's not the way they are measured. That's not the way the government says that you are going to be measured. So why should they have any respect for that. Real, real dangerous. We are doing it for convenience sake. We are going to destroy humanity for convenience sake.

He also commented that everyone should be aware of the uses of technology so that everyone could put technology to use and to be aware of how technology can be abused. "It's understanding the technology, the good and the bad, the use and abuse."

In general, Gavin felt that technology had a place in society and in the classroom. However, Gavin could still have students conduct their research project, teach his class, and carry on with daily activities without the use of technology. There was not anything that Gavin would like to do in his class, but could not because of the technology or lack thereof, and he was resentful of the powers that be forcing technology on him when they were so far removed from the classroom.

### *Ashley's Background*

Ashley knew right from the beginning that she would be a teacher, and she said her friends would have bet money on it as well. Both her mother and her aunt were teachers, so Ashley had been around educators all of her life. While growing up, Ashley played school and loved to draw on the chalkboard. She also had many good teachers over the years, but her 7<sup>th</sup> and 12<sup>th</sup> grade English teachers stood out in her mind as having a strong influence on her and helped her to develop a love for literature and grammar.

Ashley's mom taught kindergarten, "...after helping her while I was in college, I realized that I preferred older children. I honestly didn't have too much experience until I

started student teaching; I had a great situation and I really loved it.” After finishing her student teaching, Ashley quickly found a job teaching language arts. Ashley’s first few years of teaching; however, were difficult because of the discipline problems. She was not much older than the students and they took advantage of that. Now, in her fourth year of teaching, Ashley had the discipline issues under control and could enjoy the act of teaching. Ashley taught sophomore college preparatory classes and found many ESOL students in her classes. She understood the struggles that students faced when they came to America with no knowledge of the English language and found working with them to be particularly rewarding. Even as a young teacher she took these students under her wing and nurtured them. When the students were able to grasp the literature piece being discussed in class, they were grateful for her patience and kindness.

Ashley did admit that sometimes she got a bit jealous when she heard her friends talk about their office jobs. However, she realized that her friends were the ones missing out. “I realized what a great time I have all day everyday with the variety of kids that come in my room. Even when I’m mad and frustrated, it’s always interesting.” She felt that there was nothing more important than the influential role that a teacher has on a child’s life, and she cherished her job when graduated students came back to visit her and told her what an impact she had on their lives. Ashley would not trade her job for anything.

### *Ashley’s Classroom*

Each day as students entered Ashley’s classroom, they were greeted with a welcome sign and a smile from Ashley. Sometimes Ashley reminded them to take off their hats. Several students would stop to ask Ashley a question and others would wrap

their arms around her for a big hug. Ashley was more than willing to reciprocate and a sense of belonging and importance filled the air.

Ashley's classroom was an interior room so there were no windows. Ashley's desk was in the far corner of the classroom. Bookcases encased her desk so that her area appeared as a private sanctuary that she could retreat to when needed. Placed neatly on the bookshelves were various teaching resources as well as pictures of her family. The left wall was home to posters of popular teenager musicians and sports heroes. Another wall, which was an accordion wall, was left blank on purpose. Several times during the school year Ashley would team-teach with her colleague next door, and they opened the wall to work together. The wall which had the door leading into her room was filled with student work. There were poems, pictures, and stories that the students created for various projects adorning the wall. Ashley also had all the students' birthdays listed on the board. The wall in the front of the room had a large dry-erase board and a few store bought posters that followed the theme of American Literature. In the corner of the room opposite her desk was a student computer that was not used. There was a long table in the front of the room which Ashley usually sat on when teaching a lesson. Beside the table was a cart with an overhead projector and above the cart was the classroom TV and VCR mounted to the wall. The students' desks faced inward so that the students had their back to three of the walls.

Each day when the bell rang, the students quickly found their seat and got ready for the day's lesson. As with most sophomore classes, some students were prepared with their homework completed, others had an excuse why the work was not completed, and still others did not care enough to make up a story. Ashley would quickly get them

focused with a story. Ashley showed the students how American Literature related to their everyday lives. As the class read various stories, Ashley would give examples using current students' names with made-up fun scenarios. The students usually chuckled and Ashley smiled deviously because she knew that she had them hooked. She knew that they would remember the silly example and when the time came to take a test on the material, they would know the answer.

#### *Ashley's Use of Technology*

In an interview Ashley said she enjoyed using technology for both personal and professional activities. She emailed friends and family on a weekly basis to keep everyone abreast of what was happening in her life. She was especially excited about being able to communicate through email because she was getting married and there was a lot of work to do. Being able to contact someone quickly was a burden off her shoulders. At home Ashley balanced her checkbook online and paid bills using electronic transfers. She ordered concert tickets through the Internet and also researched various health topics when needed. Ashley carried a cell phone with her and used a camcorder to videotape dance practices with her fiancé. They entered dance contests and used the videotape to see how they could improve their dance steps. Ashley also owned a scanner which she used on occasion.

Ashley was currently earning her master's degree and used technology for her graduate classes. She used Microsoft Word to type papers, the Internet for research, and PowerPoint to present her findings to the instructor and to her classmates. One of her courses was an on-line class and she responded to reflections each week. Two of her three instructors used technology in their classrooms, but the third did not. One of the

instructors required her to create a PowerPoint presentation for the class, but the others said she could use any format to present her topic to the class.

Ashley also used a variety of software and hardware in her classroom. SASI and IGPro were two county-wide databases that she used to take attendance and to calculate grades, and she used the county's lotus notes email program to contact various colleagues. Ashley used Microsoft Word to type tests, homework assignments, and directions for the students explaining how to use technology. Ashley was enthusiastic about having the students use technology. She developed three lesson plans in TAFT and used them in her classroom the year that she took TAFT. This year she was only able to use one of the lessons because she received new textbooks and the projects were literature specific. She did convey; however, that with some modifications she might be able to use them again.

Although Ashley demonstrated some expanded knowledge of technology, there was some basic knowledge that she was lacking. All teachers were given a laptop during the spring semester before this study took place. Ashley used this laptop to conduct her daily activities. The laptop had a built-in CD-burner. When interviewed, Ashley was unaware that the laptop had that capability.

In another interview Ashley divulged that she was hesitant to assign technology homework that was done outside the classroom. "I'm from a small town and not many have access to computers. I don't want to put a student in a place where this assignment is so easy in my mind because naturally I go home to my computer, but the student may not be so lucky." Ashley made sure that she set enough time aside for students to use the

computers during her class time. She also let students know that she was available before and after school if they needed to come in to use the computers.

*Ashley's Stance toward Literacy and Technology: Both Enthusiastic and Fearful*

Based on observations, field notes, and interviews, the conclusion was made that Ashley's stance toward literacy and technology was that of both enthusiasm and fearfulness. The setting and who was using the technology determined her feelings in given situation. For instance, Ashley wanted to integrate technology into her classroom, so she developed lesson plans for her students. However, she was fearful to demonstrate technology use in front of her students because she was afraid that she would make a mistake and look incompetent in front of her class. The following three sections, Ashley's Instructional Approach, Application of the Competencies, and Perceptions provide documentation of Ashley's enthusiasm and fearfulness.

*Ashley's instructional approach.* Ashley had her students complete three technology related projects during the school year. In order for the students to use technology, Ashley had to schedule a time in the language arts lab, in the media center, or reserve the mobile computer lab. For two of the projects, the students were able to go to the language arts lab which was located next door to her room. For the third project, she pushed the mobile lab to her classroom, set up all the laptops on the desks and had them ready for the students' arrival.

For the first project that I observed, students were to write a poem and type it on an 8 1/2 by 11 sheet paper. Then they had to select a picture that represented and visually illustrated that piece of writing. They could hand-draw the picture, use Microsoft clipart, or download a picture from the Internet. Ashley told the students they could use

Microsoft Word, PowerPoint, or Publisher to complete the assignment. “Many of the students already know how to use Microsoft Word so I thought some might have fun playing around with the other two programs. I don’t ever like to hold them in one thing. I like for them to use what they know best.” Some students selected Microsoft Word because they knew that software the best, while others selected Publisher because they wanted to learn something new. Although she felt that the students already knew many of the software programs and were better adept than she was in using the programs, she typed directions for the students to follow when using all three applications and for downloading pictures from the Internet (see Appendix H). She did not model or demonstrate use of any of the applications because many of the students were already familiar with the basics.

An incident which occurred one day while Ashley’s class was in the computer lab demonstrated the limits of her basic knowledge. A student was sitting at a computer that had cables hooked to an LCD projector. The projector was on when she logged into the computer, and as she worked her document was projected onto the screen. Ashley walked over and placed the lens cap on the LCD projector instead of turning off the machine because she did not know how to turn the projector off. When I observed this lesson, I walked around the room to view the student work. As I walked around, I noticed that the LCD projector was smoking. The light from the projector was melting the lens cap. I quickly removed the cap, told Ashley what had happened, and showed her how to turn off the LCD projector.

Another instance of her limited knowledge and her concern of how she would appear in front of the students came up later in an interview. All the subject area labs had

scanners so a couple of the students wanted to scan in a picture for their project. Ashley told them that they would need to figure out the scanner themselves or have to scan the picture at home. She admitted to the students that she did not know how to use the scanner. Later she admitted, "I don't want to make a fool of myself in front of everyone, so I was not going to attempt to scan the picture. I have a scanner at home, and if I sat down and worked on that one I could figure it out, but not on the spot with all the students in the room." The two students brought their pictures home and scanned them on their personal computers.

Most of the students received A's and B's for the project, with students losing most of their points for not following the poem requirements. Ashley said, "I think they got caught up in the graphics part and forgot it was for an English class." However, she felt that the assignment met her expectations and she was impressed with their work.

In another technology integration lesson mid-way through the year, the students read Dante's *Inferno*, a parody which discusses the levels of hell. Ashley had her students create a project with their own version of a satire of themselves or society. She told the students that they could use any medium that they wanted to. All of her students chose to create a PowerPoint presentation. Ashley handed out simple directions for using PowerPoint, but did not demonstrate use of the program herself (see Appendix I).

They know more than I do so what I've found works better when we go to the computer lab is to keep my instructions short because so many of them do already know how to use the software, they get frustrated having to wait for me to show them. So, I give them a brief overview and talk about it and then I just walk

around and then if someone doesn't know it, then I show them different ways of doing it.

Students worked in teams of two on laptops from the mobile lab. After several days of research and putting the project together, the students presented their parodies. The class was full of laughter on that day.

The third technology assignment was a research paper on a controversial topic. Students chose a topic, selected a viewpoint, and then researched that viewpoint. Ashley handed out directions for getting to the 'opposing viewpoints' search engine through the county's homepage. "I always give an instructional handout to show the best way to their research. I tell them the best places to kind of look first and see what they find, especially some things on the Jefferson County resources pages instead of just going to Google and surfing" (see Appendix J) In class the students discussed appropriate topics and even their thoughts and feelings about some of the topics. A few of the topics mentioned in class were assisted suicide, animal rights, and immigration. A couple of times students' passions erupted and Ashley had to settle them down. Once the topics were researched, Ashley scheduled time again in the language arts computer lab so that the students could type their paper.

In an interview, Ashley acknowledged that she was disappointed this year that she was only able to have the students complete three technology based assignments, "I really wanted the students to create an advertisement in Word or Publisher for Shakespeare. And, another project that the students have done in the past is the college brochure. We didn't have time for either one this year because of the new textbooks." Ashley felt that

once she was comfortable with the new curriculum she would be able to incorporate more technology into the classroom.

While Ashley's enthusiasm towards technology should be applauded, her fearfulness of using technology has become a silent obstacle that kept her from encompassing more technology in her classroom. Last year Ashley instructed her seniors to create a children's book. Again, the students could choose any medium to fulfill the requirements. Only a few students selected PowerPoint. Because the students had to present the books to their peers, Ashley needed to borrow an LCD projector and hook the cable to her laptop so that the book could be projected on the big screen in front of the classroom. Ashley had trouble figuring out how the cables connected to the equipment so she received help from one of the media specialists to connect all the cables. For her next class, she had to disconnect the cables in order to use her laptop at her desk. Finally, Ashley connected the cables again for her third-period senior class. She was uncomfortable with the process and decided in the future that students would create only paper versions of the children's book. "I'm not good at plugging everything together, then having to unplug it because some classes aren't using it and I need it another way. It's just so complicated so I said we will just have paper projects from now on."

Ashley admitted that besides her lack of comfort with some of the technology, there were other obstacles to integrating technology into the language arts classroom.

One of the biggest problems is the trouble it takes to get access to some of the equipment for student use. I would love to have my students in the labs more, doing more projects, and research with the computers, but I have such difficulty getting into a lab. In my department, they aren't available for fourth and fifth

period. Also, once we are in the lab, there is no one in there for assistance and I do not always know what to do.

Ashley elaborated that the yearbook staff was in the computer lab fourth and fifth period on a permanent basis. Other obstacles mentioned included the lack of manuals and support materials in the labs and too little time to develop a lesson.

*Ashley's application of TAFT competencies.* When asked about the technology course, Ashley admitted she would not have chosen to enroll in TAFT the year that she took the course. "It's my second year of teaching and I'm already overwhelmed with everything else." She added, "It was obnoxious to stay after and in the very beginning was very basic stuff that I definitely already knew, but I learned about a lot of things." The county offered a test-out option, but Ashley chose to take the class instead. "I knew I could probably test out, but there was so much I felt I didn't know so I knew the class would be beneficial, and even though I know I would have never taken it on my own, I'm glad I took it." She emphasized, "My biggest complaint was that I was just out of college, and I wondered why that wasn't worked into my college prep, why wasn't it worked into the university? That kind of frustrated me." Ashley said that she has her folder on hand so whenever she wanted to start something new, she could refer back to her notes. Ashley had never used PowerPoint until she took TAFT. "I had used some technology in my classroom, but my interest in giving kids the opportunity to do it did not start until the class."

Of the seven components that Ashley had to master for the TAFT course, some of the components were adopted directly into curriculum, others were modified, and still others were not used at all. The first component of the state-mandated course was

desktop publishing and word processing. Ashley used Word to create tests and assignments, but she did not use Publisher for any of her personal or professional work. She did; however, try to include projects that had her students use both programs. One of the lessons she developed for the course involved having the students create a college brochure in Publisher and a word processed flyer for a piece of literature.

To demonstrate the research requirement in TAFT, Ashley had her sophomores research a controversial topic. The students used the county's website and links to find pertinent information. Then the students typed their paper using Microsoft Word.

Ashley was already fulfilling the communication requirement before she took the class. She already knew how to email parents through the county's lotus notes software. She was also aware of how to send attachments in email. Ashley was proficient using IGPro, the county's database for storing teachers' gradebooks which allowed teachers to email progress reports home.

Ashley created a PowerPoint presentation in TAFT for the novel that she was teaching at the time. She never used the presentation in her classroom though. "Time just kept me from being able to use it." She said there were just too many requirements to meet for the class last year and there was no time to show the presentation." This year she was not able to show the presentation either. "We had new textbooks this year, so with learning a new curriculum it was impossible for me to find the time to use it." Another reason Ashley has not used the PowerPoint presentation is because of having to connect an LCD projector to her laptop. "I'm not good at hooking it up, so I would only check out a laptop and LCD projector already connected." Laptop/LCD projector combinations were in high demand in high school and were rarely available.

TAFT required teachers to use a spreadsheet program like Excel and a database program such as the county's SASI or IGPro. During the TAFT course Ashley created an Excel spreadsheet by counting M & Ms. "I remember thinking this stuff was neat during TAFT, but I don't think I've used any of it since. I don't find a need for it in language arts." However, Ashley used SASI every day to record attendance. The database program was also used to create seating charts and class rosters which Ashley used to prepare for substitutes. To record grades and to send progress reports home, Ashley used IGPro. She used both programs before the class and did not learn any new skills during the class.

Ashley's webpage that was created as one of the components of TAFT was used as an example for the other teachers to see. The instructors were pleased with Ashley's webpage and Ashley was very proud to display her work. Although Ashley learned essential information to complete this component, she did not continue to update the page and has not gone back to the page since the class ended. "I had fun with webpage assignment, but I never did anything with it. It seems like more trouble than it's worth."

Ashley had used the AKS item test bank for the past several years to create a final exam for language arts. "Next semester I'll have to work on adding questions to the bank because of the new curriculum we have in 10<sup>th</sup> grade. We need to revamp the tests and test questions." Ashley did not learn any new concepts in TAFT for the assessment component. She was already using the item test bank and would continue to use the test bank as a resource for her final exam.

*Ashley's perceptions of technology.* Ashley believed technology was a tool for student use and for teacher use. She conveyed that technology was important in the

classroom because "...our society is technologically advanced so teachers and schools need to be up to date on it. However, I think I can teach just as well without it." Ashley said that non-technological ways of teaching were equally effective. For example, Ashley let her students select the best tool to represent their data. She allowed them to use a poster, PowerPoint, or some other medium. "I feel that technology impacts students learning. I could do the same lesson without technology, but using technology gives the students exposure that they need." Ashley said that students were used to fast input and many have computers at home so "...we are doing a disservice not to integrate that into the classroom. As teachers, we were taught to plug into student interest in order to motivate and encourage them. Well, technological advances in our society are an interest to them and can interest some students who normally wouldn't be interested." Ashley felt that her responsibility as a teacher was to reach her students by using several different methods and to use methods that interested the students.

Ashley remarked that her view of literacy had not changed even though she incorporated technology and believed that technology does not transform the basic definition of what literacy is:

I have always acknowledged that reading anything whether its menus or websites is legitimate reading. Yes, technology may open up a whole new world of literacy with different schema and ways of reading, but I don't know that that's something that has changed for me. I must admit, as an English teacher, I still think there's nothing better than simply a book. However, as a high school teacher, I am well aware that my students don't always feel the same way and

thus I need to find ways, usually that involve technology, to provide them with other means of reading and writing.

Ashley perceived technology to have a transactional relationship with literacy. She explained that although many students do not read books at home, many of them instead get on the Internet and read and write on the computer. "...literacy is reading and writing in whatever context that may be. So if they are writing emails and they are using different programs to create things, I think that is still literacy." She believed that technology and literacy work intimately together to construct literacy. Bruce (1997) stated that technologies continuously reconstruct literacies and technologies are "constructed out of the evolving literacy practices" (p. 303). Baker (2003) reiterated that it is how we interact with texts (chalkboard, paper, Internet) that makes meaning for us.

Ashley described her TAFT encounter as a positive experience. She credited the course for encouraging her to use technology in the classroom, but it had not provided her with a level of confidence that allowed her to use it in actual instruction. Ashley preferred typed directions and one-on-one instruction with her students when working with technology instead of standing in front of the entire class and showing them how to use the technology. She was afraid of signing out equipment that she might set up incorrectly and she believed that most of her students had a greater understanding of technology than she did.

#### *Amber's Background*

Amber was a theatre major in college, but she quickly realized that there were too many personal sacrifices involved in that career for her to want to become an actress. She decided to switch majors and not knowing what else to do, she consulted her friends.

One of her friends suggested teaching. With nothing better to do, Amber changed her major to education and "...I have never looked back." She knows this is where she belongs.

At first Amber took a job in a middle school teaching a drop-out prevention program. All the students were repeat 8<sup>th</sup> graders, and the program was designed to provide a more personal approach for these students who came from troubled homes or who were lost in the shuffle of a larger classroom. Although this program was successful and Amber felt that she was inspiring those students to make better choices, she left middle school to become a high school language arts teacher. Her first assignment was to instruct junior advanced placement language arts. These students had to apply to get into her class and only the best were selected to enroll.

Amber's desire was for her students to find relevance in class and make connections with their lives through literature, writing, and discussions. "I desperately want them to realize that all that we do goes far beyond characters in a book or words on a page, and I fashion every discussion, lecture and/or writing around this truth." She felt that if she could get the students to question, search, and think beyond the book to their values, their relationships, and their lives, then they were learning far more than she could ever hope to teach them. "It is my responsibility to create an environment where students welcome the sharing of different perspectives and appreciate the valuable contributions of their peers."

#### *Amber's Classroom*

Each day when students entered Amber's classroom they were greeted with a hug, a warm smile, and a twinkle of blue eyes. Amber's students were in this particular class

by invite only. Those select students were the crème of the crop and they were serious about their studies. Although they acted like normal teenagers by gossiping about the weekend, the newest fashions, and who was going with whom, they were also dedicated students.

Amber's classroom had two big windows on the far wall. Looking out students could see the side parking lot where teachers parked, a row of trees, and then a student parking lot below. Under the windows was a large couch with pillows. Students could choose to sit in their assigned seat or on the couch on any given day. When students were directed to move into groups of three or four students, they would often race to the couch and claim it for themselves and their group members. In the front of the room was a large dry erase board with a long table in front. In the corner between the table and the couch was a bookcase with several books that the students could check out and read at their leisure. In the other corner was a student computer with a TV and VCR mounted above. The student computer was used on the rare occasion that there was free time. "For my purposes one computer is a waste of money," Amber emphasized. The wall with the door leading into the room held student work. There were hand-drawn posters and computer generated posters as well as student stories and poems on this wall. On the back wall, the same took over with a few store-bought, colorful posters mixed in. The posters were hung sideways or slightly turned to give the wall more character. In the far corner was Amber's sanctuary. Her teacher manuals were on a small bookshelf and her desk was opposite the shelves. Here she had pictures of her family as well as several types of flowers and butterflies. "I've tried to create a warm, vibrant environment that is both stimulating and inviting." she said. Student desks faced the center of the room so

that their backs faced three walls. Amber seldom used the overhead florescent lighting. Instead she opted for floor lamps which along with burning candles gave the room a warm ambience. Hanging from the ceiling were pipe cleaner projects. Amber had the students create some type of figure that represented their interest, value, or hobby. Amber felt that students have a sense of ownership and belonging when their work is displayed.

#### *Amber's Use of Technology*

In an interview Amber divulged that she took pleasure in using technology for personal and professional pursuits and used a variety of hardware of software. She owned a computer, all-in-one printer, camcorder, CD burner, and cell phone, all of which she used on a regular basis. Amber exercised use of the Internet to purchase books and various other gifts, to conduct online banking, and to answer email.

In the same interview Amber disclosed that she recently received her Gifted Certification. For two presentations in the certification class, Amber designed a PowerPoint presentation. Amber choose PowerPoint as the medium as the instructor allowed them to use whatever method they wanted to use. The first PowerPoint presentation listed the overall characteristics of the gifted child and the second presentation was advertising a unit of instruction where she had to pretend that the people in her class were representatives of the school system and she had to sell her "unit" to them.

This past year, the language arts department adopted new textbooks, and Amber volunteered to be on the textbook adoption committee. Part of the information and training from the publisher was created in PowerPoint. Teachers were to use the CD

provided by the publisher and review the PowerPoint presentation which gave directions on how to use the new books. Amber then provided instruction to her colleagues in short sessions throughout the school year.

In the classroom, Amber used the same types of hardware as she did at home, but she also used several other applications. At the high school, Amber employed county mandated software such as SASI to take attendance, IGPro to keep track of her gradebook, and Lotus Notes for email. She also utilized PowerPoint, Publisher, Word, Inspiration, and the Internet for her class work. Amber created a PowerPoint presentation to introduce a unit on Moral Perfection and had the students design their own PowerPoint presentation on the elements of a short story. She used Inspiration to assist with graphic organizers and Word to type directions, lessons plans, and tests. Both Amber and the students used Publisher to fabricate a calendar and show their understanding of transcendentalism (romantic writing) and anti-transcendentalism (dark romantic writing.) Amber was enthusiastic and eager to use technology in front of her students and to have her students use technology. Amber said, "I try to keep things interesting for me as well as the kids and so I rarely do the same thing. I always try to think of something new or add some new facet that I haven't done before." Not only did Amber use two of the three lessons she created in TAFT, but she went ahead and found more ways to incorporate technology after taking the class.

Amber did not assign technology homework to be completed outside of class time. However, if students were absent when the class used the computer lab or if some students were slow workers, she let the students know that she was available before and

after school. She knew that some students may not have a computer at home and did not want them to be at a disadvantage.

*Amber's Stance toward Literacy and Technology: Both Eager and Enthusiastic*

Based on observations, field notes, and interviews, the conclusion was made that Amber's stance toward literacy and technology was that of enthusiasm and eagerness. Amber was eager to use technology in front of her students and eager to see the projects that they turned in. She was enthusiastic about learning new ways to incorporate technology in the classroom. The following three sections, Amber's Instructional Approach, Application of the Competencies, and Perceptions provide documentation of Amber's enthusiasm and eagerness.

*Amber's instructional approach.* On page 1 of the survey Amber wrote that she used PowerPoint to introduce several units throughout the year and to provide an overall focus of what objectives were to be covered. Then, in an interview she elaborated that she borrowed an LCD projector from the media center, connected the cables to her laptop and let the students view her presentation on the big screen in the front of the room. Amber had her students use technology for six projects during the school year. Four times she was able to obtain permission to use the language arts computer lab and twice she reserved the computers in the media center.

On the school's network was a folder that all students and teachers could access. Inside were other folders with each teacher's name. There, each teacher could place documents for the students to retrieve. Amber used this assignments folder to hold the directions for the projects that she had the students complete and to list the directions for using the various software applications. From anywhere in the building students could

access her folder and look over the assignment. In this same folder was something called an “inbox.” Students copy and paste their work into their teacher’s inbox and the teacher could recover the work and grade assignments at her leisure.

The first project where Amber integrated technology, students used Publisher to create a calendar. Amber’s class met in the language arts computer lab which had an LCD projector connected to a computer in the front of the room. Amber went through the instructions with the students by demonstrating the main components of the program. Although some were already familiar with the basics of Publisher, they looked on with anticipation of learning a program. “I have all the directions laid out for the students and I go through them with the kids, but actually, you know, the majority of them have a fair amount of experience on PowerPoint. Fewer have used Publisher and so I go through the directions with them as far as choosing a template, so it’s a little more thorough with that program,” Amber emphasized. For each month on the calendar the students wrote a belief of the transcendentalist or anti-transcendentalist. They accompanied the belief with a graphic that was appropriate to the quotation taken from any of the writers they had studied. The writers included were Edgar Allen Poe, William Cullen Bryant, Nathaniel Hawthorne, Ralph Waldo Emerson, and Henry David Thoreau. Amber noted that students were required to explain their reasoning; she stated, “...in addition they would have to write some commentary to me about why they put those quotes in, what they mean, and why they picked them as far as a writing component.”

Following this technology-based lesson, Amber had her students create a daily planner using either Word or Publisher. They had to create a table listing the seven days of the week and then list their plan for moral perfection. Each day they had to write in

their planner/journal as to whether or not they succeeded with their plan. This was the first year that Amber had her students keep track of their plan for moral perfection using a daily planner. She said the lesson was "...definitely successful. They went above and beyond my expectations. I would use this lesson on self-awareness again."

Just before Thanksgiving, students created a family tradition newsletter using Publisher. The newsletter had three columns and was folded twice to create a booklet. The students wrote about types of food eaten at Thanksgiving and Christmas, or whichever holiday they celebrated, and they described unique family traditions for the two holidays. Clip art, graphics, and scanned-in pictures of the students added a personal touch to the project.

PowerPoint was selected for a fourth technology assignment. Students had to list the elements of a short story in PowerPoint presentation. One element adorned each slide as well as an example or definition. Elements included were the plot, setting, point of view, conflict, characterization, and theme. The students incorporated sound, video, clip art, and other graphics into their presentation.

In addition, Amber required her students to write a career research paper, but the assignment was not the traditional research paper.

Instead of having them do a very dry, bold research paper, obviously they need to think about and investigate salaries and see what kind of schooling it requires and there is some good information for them to glean from the research, but to just put in a paper is very boring, so I've had them design a newsletter where they were the recruiter for the given profession that they researched.

The newsletter had to be persuasively written and had to cover salaries, schooling, viable markets, and any other information that they had researched. Students manipulated the Internet to search for information and they also had access to the Georgia Career Information System. This database listed hundreds of occupations with information on salary, schooling, employment outlook, setting, physical demands, and several other characteristics for each job.

The final technology project of the school year was a research paper entitled *A Nation in Crisis: Then and Now*. Students had to reference a speech given by President George W. Bush after September 11, 2001, and compare his speaking strategies to those of either Patrick Henry or Thomas Paine as they sought to rally Americans in a common cause – war. The students used the Internet to conduct the searches and Microsoft Word to type the report.

Overall, Amber was pleased with the technology projects she had her students complete. However, she stated in an interview that she would like more time to incorporate technology. "...the textbook itself is over 1,000 pages and obviously there is no way I could ever finish the textbook even if I did nothing but just the textbook all year, and I wouldn't be incorporating technology. That leaves me with choices of what to cover and what not to cover and how to cover it." The AKS dictated concepts that Amber had to include in her teaching, but not which stories to include. "So, it's kind of a crap shoot like gambling. Once the final exam starts circulating I can give a crash course, but that is not preferable." The final exam was limited to certain authors, but if Amber did not cover those authors during the school year, the students were at a disadvantage.

Even though Amber assigned six technology projects throughout the school year, she still found challenges to integrating technology into the language arts classroom.

Amber said time was one of her greatest challenges:

I have many ideas on how to use technology in my classroom, but taking the time needed to get to the lab and implement the lesson feels like I am taking more time than I should. Getting to the lab, logging kids on, getting them started, and printing as needed all takes time, and I feel pressure to press on with my AKS. I often feel inundated with the rigors of teaching English and lack of time necessary to plan such a valuable lesson.

At the same time, Amber did not see availability of computers to be an obstacle to computer integration. “There are four major content labs, one productivity lab, two mobile labs, and three areas of computers in the media center. There is an abundance of computers. In looking at the big picture, we are very blessed and have a tremendous amount of luxury at our school that most schools don’t have.” On any given day, there are 10 labs that teachers can reserve for technology use. However, “the more teachers are trained, the more they want to use the computers, so obviously if all the teachers become proficient in computers, they are going to want to use the computer and then the numbers become increasingly more limited.”

Amber conveyed that a lack of knowledge also prohibited her from using some available technologies during the school year. There was a scanner in the language arts lab that Amber would like to have used on occasion. Unfortunately, there was no manual in the lab, and she was unable to figure out how to use the machine. “I just haven’t had the time to track someone down to tell me how to use it.” Amber planned on making

arrangements with the local school technology coordinator to learn how to use the scanner as soon as time permitted. The only other obstacle Amber mentioned was lack of manuals for the hardware in the language arts lab.

*Amber's application of the TAFT competencies.* Amber was using several of the TAFT components before she took the class and she admitted that she only enrolled in the course because it was mandated in order for her to keep her certification. However, Amber said,

My interest in technology was peaked in the class. I have to give complete credit to that course. I was so impressed with PowerPoint that I put it to work. Then I was exposed to Publisher and I put that to work. Anything that I have done with technology, even down to generating word documents with Internet links to dictate where specifically students are allowed to go on the Internet, I got from the class. So, I would say that everything I do with the computer is courtesy of the course.

Of the seven components that Amber had to master for the TAFT course, some of the components were adopted directly into the curriculum, others were modified, and some were not implemented at all. The first module of TAFT was desktop publishing and word processing. Amber used Word to create tests and lessons for the students, but her utilization was limited. Amber had not applied desktop publishing to her lessons before she enrolled in TAFT. In TAFT Amber created the lesson plan that required her students to design a calendar with quotations from the authors they had been reading. They also inserted clip art that represented the quote. This year she had students create

that same calendar, as well as one newsletter, one daily planner, and a career paper all in Publisher.

In TAFT, Amber wrote a lesson plan for a research paper to demonstrate mastery of the research requirement. As noted earlier, during the spring semester she had her students research a speech given by President George W. Bush and compare his style with other American leaders in history. In the TAFT class, Amber also learned a few strategies for using the Internet. “I use the Internet sites more efficiently and teach the students to do so as well. I also tailor make a list of links when I want them to use only certain ones.” Amber was able to find the information that she wanted her students to employ and pasted the links in a Word document. She placed the Word document in her assignments folder where the students could access the information when needed.

Before she took TAFT, Amber was already fulfilling the communication requirement. Amber already knew how to email parents and how to use the attachment option in email through the county’s Lotus Notes program. Amber was also already using IGPro, the county’s gradebook program. She was updating her grades and emailing progress reports home to parents on a weekly basis.

Amber had not used PowerPoint before taking TAFT. She wrote a lesson plan for having the students create a PowerPoint presentation based on the 1930s. A few of the topics the students had to research were fashion, cost of living, and the mafia. The first year after TAFT Amber had her students construct this particular PowerPoint presentation. However, in subsequent years, Amber designed her own PowerPoint presentation to introduce a unit on American Literature, and she had the students construct another presentation on the elements of a short story.

Two applications joined into one component was spreadsheets and databases. The instructor for TAFT introduced Excel, a spreadsheet program, by having the teachers count M&Ms. Although Amber quickly learned to use Excel, she never employed any of the skills in her classes. Amber did not find a parallel for instruction of the AKS for American Literature and spreadsheets. Two databases that the county used was IGPro and SASI. IGPro was discussed earlier in the communication component. Amber utilized IGPro to email progress reports home and to keep track of her gradebook. SASI is the county's attendance program. Amber was required to take attendance in all five of her classes using SASI. She also utilized the program to print class rosters and to locate student phone numbers and addresses.

TAFT also required teachers to develop a web page. Amber fabricated a web page that gave information about the courses she was teaching. "Though I thoroughly enjoyed making my own, I have not required this component in class nor pursued it further. I have a limited amount of time and I would rather spend my time thinking about ways that I can have the kids incorporate technology versus going to my website and getting information." Amber enrolled in TAFT during her first year at Carthage Central so she was "...making a lot of adjustments to try to get myself up and working." Therefore, she did not have time to do much with the web page then, and now she was not interested in pursuing the updating of the web page.

The last component of TAFT necessitated teachers to use the AKS test item bank and to use a rubric for scoring the technology based assignments. Amber did not create her own final exam; instead, she used the one that her colleagues made. "I rarely use the item bank, in fact, typically only when required." For the rubric requirement, Amber

designed a rubric for the Publisher calendar. The categories included in the rubric were creativity, effort, all elements covered, and punctuation, spelling, and sentence structure.

*Amber's perceptions of technology.* Amber believed that technology was an instrument for student and teacher use. Amber said, "...technology is a marvelous tool to improve teaching and learning and literacy education in the classroom. I use it to teach, I use PowerPoint or I'll design things, I use it to have them learn and show what they have learned, developing projects and obviously there is a tremendous amount of writing involved anytime they are creating something on the computer." She demonstrated this belief by integrating technology into her lesson plans and by having the students create several technology projects throughout the year.

Amber commented that some students were not artistic and did not do well when making a poster to represent an idea. By using the computer, students could focus on content rather than on drawing skills that they might be lacking:

The computer holds great opportunity for creativity. It provides opportunity for kids who are not artists to enhance their work and not feel so intimidated or inadequate if they are not artists. Whereas before, if you asked students to do work, immediately some of them felt diminished because they are not very good artists or felt that you wanted something creative and fancy, whereas the computer and technology levels the playing field, so to speak.

Amber said she found the marvels of technology to be amazing. "The students are much more enthusiastic and the output of the work they do, they are much more engaged when they actually doing something with technology." She said the students even commented that they were having fun designing their calendar and their daily

planner for moral perfection. Amber emphasized that it was one thing for her to be able to scrutinize her own character and realize the importance of the person she would like to be because she is much older and wiser and another for her students to understand the concept:

To have the students apply the concepts and the principles of the assignment and to be able to use the computer, I am positive that designing those daily planners and finding those quotes on the Internet and letting them look at those quotes, the technology used in this lesson was absolutely imperative. There is no way in this world I would have even gotten remotely the response that has come using the computers.

Amber invoked that her students were sincere in asking questions about the assignment, in thinking about their behaviors, and in looking for quotations that fit their assignment. “I mean it has been up to this point a total success, and it’s purely because of the computer. No doubt about it.”

Amber perceived technology to have a transformational and transactional relationship with literacy. Transactional as described earlier in Ashley’s section indicates that literacy is constructed through technology in specific contexts. Bruce (1997) describes transformational as technology having a positive result on literacy by changing the nature of what literacy is. Amber noted that technology was a tool to improve teaching and learning literacy education and that technology transformed the basic definition of literacy “...and all is involved in just the process of using the computer – thinking, writing, and expressing. Technology incorporates all parts of literacy. Clearly, an understanding of how to use technology and a growing comfort level in doing so is an

education all teachers need to provide for students to be competitive in the 21<sup>st</sup> century.” Amber went on to say that technology was an intimate part of the construction of ideas and expressions and that “...technology is not a separate entity from reading, writing, thinking, and expressing. The more I can weave the application of all of them at the same time, the higher order thinking will be required from the students and expected and I really like that.”

Amber believed the TAFT experience had given her the knowledge to integrate technology into her classroom more effectively. She already embraced technology before, but the TAFT class provided her the realization of two new programs, Desktop Publishing and PowerPoint, that allowed her to invent new projects that have captivated her students. Her students’ positive reaction to her projects had increased her enthusiasm for wanting to integrate technology, and she was eager to develop new assignments so that her classes remain exciting to all that participate.

#### Cross Case Analysis

The previous section described three high school language arts teachers as they integrated technology after participating in a state-mandated technology professional development course. Data for the study came from interviews, field notes, observations, and artifacts between August 2005 and May 2006. There were four themes that emerged after analyzing the data across the three cases: (a) technology learned in a staff development course was adopted into the classroom, (b) TAFT resulted in engagement and enthusiasm for using technology, (c) restrictions on time impacted technology integration, and (d) available technology sat idle.

*Theme 1: Technology Learned in a State-Mandated Course was Adopted and Diffused*

The three participants adopted and adapted many of the technology components that they learned in the TAFT class by transferring specific activities or assignments they created back into the classroom. Only a few components were not adopted at all. Table 8 illustrates this information. For instance, the first component of TAFT involved the use of Microsoft Word and Publisher. All three participants had some basic knowledge of Microsoft Word before taking TAFT. They used Word to create tests and type directions for assignments. However, after taking TAFT, they were able to use higher level skills in Microsoft Word. For instance, they learned how to insert clip art and used this tool for creating future assignments. All three participants adopted the letterhead activity into use. Gavin also designed a flyer for his curriculum and planned to use it in subsequent years. Ashley and Amber, the other two participants, adapted their understanding of Microsoft Word as they used it in their curriculum. The course showed them higher level skills to use with this software program. They then taught their students these skills and allowed the students to turn in their projects using Word as their medium. Ashley and Amber also adapted Publisher activities and lesson plans created in TAFT into their classroom. They did not use the flyer they had created using Publisher software, but instead, had their students create projects using Publisher. Ashley allowed her students to use Publisher for the poem project, and Amber adapted the skills she learned in TAFT to have her students create a newsletter, daily planner, and career project in Publisher.

Understanding ways to effectively use technology research was the second component in TAFT. Gavin was already requiring students to write a research paper, so

Table 8

*Components Adopted and Adapted Directly From TAFT*

	Gavin	Ashley	Amber
Component 1 Desktop Publishing for Instruction: Word and Publisher	already using lower level skills, but adopted higher level skills in Word  did not adopt Publisher	already using lower level skills, but adopted higher level skills in Word and adapted Word  adopted and adapted Publisher	already using lower level skills, but adopted higher level skills in Word and adapted Word  adopted and adapted Publisher
Component 2 Research	already using research	adopted research	adopted research
Component 3 Communication	already using Lotus Notes adopted IGPro	already using Lotus Notes already using IGPro	already using Lotus Notes already using IGPro
Component 4 Presentation	did not adopt presentations	did not adopt TAFT presentation, but adapted a new lesson plan for students	adopted presentations and created new lesson plans for students
Component 5 Spreadsheets and Databases	did not adopt spreadsheets adopted SASI and IGPro	did not adopt spreadsheets already using SASI and IGPro	did not adopt spreadsheets already using SASI and IGPro
Component 6 Web Pages	did not adopt	did not adopt	did not adopt
Component 7 Assessment	already using	already using	choose not to use

he used this existing lesson plan to fulfill the TAFT requirement. He did not change his assignment as a result of the TAFT class, and he did not bring any new information back into the classroom. Both Ashley and Amber developed a research lesson plan for TAFT and then brought the plan into the classroom for student use. Ashley had her students

research a controversial topic, and Amber had her students research a speech given by President George W. Bush and other American leaders. In these ways, Ashley and Amber adopted the specific activities they had created for the research component directly into their classroom. To utilize technology in doing the research project, all three participants brought their students to one of the ten computer labs at the high school

A third component of TAFT was the use of technology as communication. All participants were already fulfilling this requirement. Gavin, Ashley, and Amber were using Lotus Notes to email colleagues and parents. Ashley and Amber already knew how to use IGPro, the county's gradebook program to send weekly progress reports home. Gavin learned this skill in TAFT and started emailing progress reports home on a weekly basis. For this component, Ashley and Amber did not bring back any new skills, but Gavin learned to use IGPro for emailing parents and continued to use that feature throughout the school year.

Ensuing that teachers could effectively create and use PowerPoint presentations was the next component in TAFT. Two of the teachers in the study were less likely to personally use this software in the classroom, in part because of time pressures. Both Gavin and Ashley said that time restricted them from using the PowerPoint presentation they designed in TAFT. However, although Ashley did not use the particular PowerPoint presentation she had created for her use in the classroom, she did create a lesson plan for the students to use PowerPoint. By adapting the skills she learned in TAFT, she was able to have her students develop a parody for Dante's *Inferno* using PowerPoint as their medium. Amber, on the other hand, not only used the PowerPoint she designed in TAFT, but went on to have her students create another PowerPoint presentation. Amber adopted

the unit on the 1930s into her curriculum and then had her students design a presentation on building a short story.

Spreadsheets and database use was the next component in TAFT. None of the participants adopted use of spreadsheets into the curriculum. Amber said that she did not use spreadsheets at all during the school year and Ashley commented that she had not used spreadsheets since taking TAFT. Ashley and Amber were already using SASI and IGPro, two databases that the county uses for attendance and gradebooks. They were using SASI to print classroom rosters, to look up addresses and phone numbers, and to filter for students who might be failing. Gavin, on the other hand, learned these skills in TAFT and continued to use them. Therefore, he adopted the database skills that he learned in TAFT.

TAFT also encouraged teachers to explore the creation and use of web pages; however, none of the participants adopted the web page component into their classroom. They did not keep up with the web page they created for TAFT, nor did they require their students to create a web page. Gavin volunteered that he did not feel confident in creating a web page, and Ashley felt it was more of an effort to create the page than it was worth. Amber said that she would rather find ways for her students to use technology instead of just visiting a web page that she created to get information.

Assessment was the last component of TAFT. Teachers were to access the county final exam database to add questions or to create a final exam. Both Gavin and Ashley already accessed the database each year to modify their final exam. Therefore, they did not learn any new skills and did not adopt anything into their classroom. Amber knew how to access the database and fulfilled the TAFT requirement, but chose not to create

her own final exam. Other teachers in her department made the final exam and shared the test with her at the end of the semester. Therefore, none of the participants adopted any new skills.

*Theme 2: TAFT resulted in Engagement and Enthusiasm for Using Technology*

None of the participants had any desire to take the TAFT class and they only attended the course because it was state-mandated. Gavin disliked being forced to take a technology course and to master the seven components dictated by the state and county; however, he noted that he could not help but become engaged during a number of the lessons. Gavin learned to create a school letterhead that he uses on all his professional correspondence, and he designed a flyer to highlight his yearly reading marathon for *Paradise Lost*. Gavin learned something new in almost every component of the TAFT class and after completing the course, the resentful Gavin admitted that the course was worthwhile.

Ashley was in her second year of teaching and overwhelmed with learning classroom management, learning the curriculum, and learning to teach. She did not feel that she had the time or energy to take the TAFT class but chose to attend the course even though she thought she could have tested out. Although not overly excited about the class, she too soon became engaged in the curriculum and learned useful information from most of the components that TAFT covered. Most notably for Ashley was her new knowledge of PowerPoint, which she had not used before TAFT. Ashley immediately saw the opportunities that PowerPoint held and wanted her students to use this. Ashley, like Gavin, did not look forward to taking the TAFT class, but the technology use that she learned changed her outlook on the value of the experience.

Amber admitted that she only enrolled in the TAFT course because it was required to keep her teaching certificate. After the experience, she was thankful for the knowledge that she gained and she gave complete credit to the course for her innovative lesson plans and student successes. Her change in attitude towards the class was a direct result of her new enthusiasm for programs such as PowerPoint and Publisher. In the certification class Amber developed a lesson plan for a unit on the 1930s. The plan called for the students to use PowerPoint to present their findings, and Amber was so enthusiastic about this lesson that she had instituted the lesson into her classroom before the TAFT class was even over. At the end of the year Amber concluded that all of her projects were a success, “purely because of the computer. No doubt about it.”

The use of technology not only engaged the participants and allowed them to look back at the TAFT class enthusiastically, but it also had the same effect on the participant’s students when they incorporated technology into their lessons and projects. All three participants believed technology to be a tool for teachers and students. Ashley exclaimed that technology impacted student learning. She said that with the technological advances in our society, students were interested in technology, and we should find out what the students’ interests are and motivate and encourage them. Ashley also emphasized that students need to know how to use technology to work, live, and play in society. Therefore, using technology in the classroom exposed the students to real world applications that they would experience outside of school. Gavin acknowledged the benefits of technology through the additional avenue of creativity that technology could provide. He was able to use Hypersnap to download pictures of literary characters for his lessons, and he felt that technology helped him to save time when finding and

sharing anecdotes with his students. Amber also thought that technology provided the prospect for creativity. Technology allowed students who are not artists to enhance their work and not feel diminished because they were not good at drawing, she accentuated.

The knowledge obtained by each of the participants about potential uses of technology was engaging, and each of them found themselves enthusiastically remembering the course even though none of them wanted to be there in the beginning. Ashley and Amber went on to implement numerous lessons and projects for their students that integrated technology, and they found that their enthusiasm carried over to the students as well. Amber said her students enjoyed creating their Publisher projects and asked thought provoking questions in order to do their best work. She found the students to be more engaged with their work because of the technology use and more enthusiastic about the output of their work.

The TAFT course allowed the teachers to create lesson plans that could be utilized in the classroom. Table 9 below illustrates the lessons/projects that the teachers designed in TAFT and the asterisk indicates that the project was implemented.

Table 9

*TAFT Competencies Implemented*

	Gavin	Ashley	Amber
Technology	Flyer	College Brochure	* Daily Calendar
Projects	* Literary Territory	* Controversial	* A Nation In Crisis:
Designed		Research Paper	Then and Now Research
in TAFT			Paper
	British Literature	PowerPoint to	1930s PowerPoint
	PowerPoint	introduce novel	

*Theme 3: Restrictions on Class Time Impacted Technology Integration*

Time to integrate technology was a challenge for all participants. Gavin said that he was able to accomplish more with his students back in the 1980s than he is today. He emphasized that standardized testing is taking away instructional time. He added, “Classroom time is very precious to me and I tell them that when I take them to the library, I’m giving up an hour of my instructional time.” Similarly, Ashley agreed that the school day was busy. She said she would like to use more technology, but there is no time to develop new lessons that goes along with the new textbooks. She was disappointed that, because of the pressure she felt on needing instructional time for the new curriculum, the students were not able to be involved in some of the activities she would have liked them to do. Amber reiterated what both Gavin and Ashley said. With adoption of a new comprehensive literature textbook, Amber felt she did not have time to cover the entire book in one school year and to integrate technology as well. When she did set aside time to use sophisticated software programs, she felt tension because that meant she had less time to address works of literature that might be on the end-of-course-test.

Although all participants created a PowerPoint presentation in TAFT, two of the participants never used the teacher made presentations. Both Gavin and Ashley stated that there was not enough time to view the presentations. Gavin also mentioned that it would take too much time and energy to check out the LCD projector from the media center, carry the equipment to each of his floater classes, and set up and then disconnect the cables in each room.

Another way time played a role in teachers not being able to use technology was the degree to which they felt they had no time to learn to use available hardware that was not addressed in the training. For instance, there was a scanner in the language arts computer lab for all teachers and students to use. Teachers were not trained to use the equipment and there were no instruction manuals in the room. Amber desired to operate the scanner, but could not figure out all the options and did not have time to find someone who knew how to use the equipment. The lack of time for additional training challenged the teachers' technology use.

In summary, restrictions on time impacted technology integration and was an obstacle for the participants when they wanted to integrate technology. The participants expressed a desire to use technology and recognized applications that would fit with their curriculum, but they could not achieve their objectives. Whether the time in question was standardized testing, writing lesson plans, covering the basic curriculum, lack of instructional manuals, or lack of time for additional training, all participants found time to be a challenge in integrating technology.

#### *Theme 4: Available Technology Sat Idle*

Several software programs and pieces of technology equipment available to the participants were not utilized. Both Ashley and Amber had opportunities to use a scanner that was available in the language arts computer lab. However, neither participant knew how to use the equipment because of lack of training and lack of instructional materials. When Ashley's students were working on their poem project, several students wanted to scan in a picture. Ashley told them they would have to scan the picture at home because she was unsure of how to use the scanner. Also, because of Ashley's inexperience, she

suggested that her students turn in paper projects instead of using PowerPoint. She did not want to connect LCD cables to her laptop and perhaps make a mistake in front of her students.

All three of the participants used at least one of the 10 computer labs which consisted of four stationary subject area labs, two mobile labs, one productivity lab, and three areas in the media center that were available in their High School, but they had different opinions on their ease of use. Gavin stated that “equipment is not readily available” and Ashley declared, “I have such difficulty getting into the lab.” Meanwhile, Amber reserved the labs on six different occasions throughout the year and was delighted with the availability of the computer labs. She found the school to have an abundance of computers. Amber appeared to either understand the system of checking out computer labs better, or she must have been more willing to work with the system than the other teachers. Regardless of the reason, Gavin and Ashley were not able to take advantage of the labs to the same level as Amber.

Gavin admitted that he would enjoy having a website for both the *Paradise Lost* reading marathon and a website for students to use as a resource, but he did not feel he had the training he needed to complete the tasks. He spoke of a high school in Chicago that has a website for their reading marathon, and would like to make one for his reading marathon, but he does not have the knowledge to make it active. He also added that having a website to help students find various information would be beneficial, but that he did not have the expertise to do that either.

There were several support personnel at the school who could have assisted the teachers in their use of the available technologies. Media specialists are available on a

daily basis to assist teachers with their needs. There are two Local School Technology Coordinators who give training to teachers. There are also two Technology School Technicians for teacher assistance.

At Carthage Central High School there was a student computer in each classroom, but none of them were taken advantage of. In Gavin's room, the mouse was missing for the entire school year, and neither he nor the resident teacher of the room acquired a new one. Ashley admitted that her student computer sat idle, and Amber said that students might print an essay or an assignment in her room, but otherwise, it too, sat idle. Next door to Ashley's room was the language arts computer lab with an LCD projector already attached to one of the computers. Ashley could have used this room to show the PowerPoint presentation that she created as an introduction to various units. She could have also allowed her students to use the projector for their PowerPoint projects. However, she had not been trained on how to turn the projector on and off and had no trouble shooting skills should the projector not work once she began her lesson.

A discussion towards the end of the year also made clear that Ashley was not instructed on the full capabilities of the laptop that she used for the entire school year. During one of the closing interviews Ashley mentioned backing up her files from school so that she could bring a copy of her work home. When asked if she knew that her laptop had a CD burner built in, she replied, "No." The CD burner was not an essential piece of technology, but it spoke volumes to idleness with technology when a teacher was carrying a laptop to and from school daily, and she did not even understand the full capabilities of a machine with which she should be most intimate.

Available spreadsheet and web page software was also not used in the language arts classroom because the participants could not see a correlation between the two or did not believe the integration was worth the effort. Gavin said that he did not find a need in his classes to incorporate spreadsheets in the language arts classroom. Ashley reiterated that feeling, “I don’t find a need for it in the language arts.” Amber did not find a parallel between American Literature and spreadsheets so she did not employ Excel. Gavin did not feel confident that he could build a web site, and he had not made the time to learn about the software.

This chapter described three high school language arts teachers as they implemented technology after participating in a professional development course focusing on technology. After analyzing each case study in depth, four cross case analysis themes emerged: (a) technology learned in a professional development course was adopted into the classroom, (b) TAFT resulted in engagement and enthusiasm for using technology, (c) restrictions on time impacted technology integration, and (d) available technology sat idle. The next chapter provides the discussion and conclusion for this study. Also included in chapter 5 are recommendations for future research and implications for professional development.

## CHAPTER 5

### DISCUSSION AND CONCLUSIONS

Over the past few decades, Georgia has invested millions of dollars to acquire computer-based technologies. Stakeholders of educational technology have noted the benefits of investing in technology integration in the classroom. However, they cannot reap the rewards unless teachers are prepared to use technology for instructional purposes.

In 2000, the Georgia legislature passed House Bill 1187 which mandated that all teachers must demonstrate computer competency in order to renew their teaching certificate. The school system in this study developed a professional development training model to meet the guidelines that the legislature put forth. Due to a lack of research in this area, this study provided a detailed look at three high school language arts teachers as they integrated technology after participating in this particular state-mandated professional learning class. The training resulted in technology implementation and the teachers in the study all had success with using technology as a tool and to some extent with the students in the classroom. However, there were issues where technology was not being utilized to its greatest advantage. The factors underlying these results are discussed in the following headings: (a) training predicted implementation, (b) technology was not used to its fullest potential, (c) technology was adopted and diffused, (d) technology was affected by participants' stance toward literacy and technology, and

(e) technology was affected by participants' perceptions of literacy and technology. Also included in this chapter are recommendations for future research, implications for professional development and the conclusion.

### *Training Predicted Implementation*

When teachers enroll in a technology class, the course developers hope that the teachers will convert their lessons into their daily routine. This study found that teachers took the knowledge they learned in TAFT and went back to the classroom to use their new skills. Gavin only had minimal skills using the county's databases and software applications before participating in TAFT. Once he learned additional skills in TAFT, he incorporated them into his classroom. His use of these skills focused primarily on management issues and on communication. He also occasionally used software as tools to create publications for events or to share pictures.

Both Ashley and Amber brought back a wealth of information to their classroom. Both had already mastered the county databases, but they gained knowledge in other areas. They learned how to implement Word, Publisher, PowerPoint, and the Internet so that their students could create several projects throughout the school year. They not only used software personally, they encouraged their students to also do so.

Thus, this study showed a parallel between technology training and implementation. The participants all implemented some type of technology in their classroom after participating in TAFT. These findings coincided with previous research studies asserting that formal technology training influenced technology use in the classroom (Becker, 1998; Blankenship, 1998; Criscione, 2005; Marsh, 1992; Martin, 1990; Nonis, 1999; Ray, 2001; Reichstetter, 1999). For example, teachers in Nonis'

study (1999) reported an increase in technology use for personal use and for integrating technology into the classroom after participating in a training class. Also, ten of the twelve participants in Ray's (2001) study integrated technology after participating in a technology training course. These ten teachers envisioned their role as a teacher to extend beyond the teaching of their subject area. They felt the need to prepare students for a technological society because they believed technology impacted the students' lives. The same was found in this study. Two of the three participants stated that they felt technology impacted students learning, and they needed to give students the opportunity to use technology because it is prevalent in today's society.

This study provided an examination of what actually happens in the language arts classroom when teachers use technology for instructional purposes. With the three participants, pedagogy took precedent in developing their lessons and projects, but technology enhanced their instruction. Young and Bush (2004) note, "The power of the pedagogy must drive the technology being implemented so that instruction, skills, content or literacy is enhanced in some meaningful way...Thus, the pedagogical goals take precedence; the technologies are thought of as another means of reaching those goals" (p. 7). The participants chose the best tools to enhance their instruction. Gavin demonstrated this by having his students use the Internet for research instead of the limited number of books in the media center. He also exhibited this with his use of technology for classroom management, but was limited in seeing how technology could enhance his instruction in other ways, so his vision of possibilities limited his integration. On the other hand, Ashley and Amber were able to see more possibilities for technology to enhance their instruction and developed more technology-based projects. They found

grades to be better, students were more creative, and students asked more thought-provoking questions because of technology use on the projects. These teachers also permitted their students to select the best medium for some of their projects. They empowered their students and allowed them to find the best tool to represent their means of expression. If other language arts teachers can see the benefits of using technology, then, they too, will be able to use technology effectively in the classroom. This study shows that teachers who view technology integration from the Young and Bush (2004) framework can be successful with implementing technology. This was accomplished by validating students to achieve success by supplementing and enhancing instruction by providing resources or by expanding students' means of expression.

As training predicts implementation, the more chances the teachers have to enroll in technology courses, the more technology will be used in the classroom. With the additional training that these teachers receive, comes the added opportunities these teachers will have to be more comfortable with technology and see how technology can enhance their instruction. At the same time, the nature of training provided may also predict the nature of implementation. Most of the training experienced in this study taught the teachers to use technology as a tool, some of the training taught the teachers to integrate technology into the classroom culture, but none of the training allowed the language arts teachers to see how literacy could be transformed by technology use.

The goals of the TAFT course were to teach technology competencies, and the course was successful in instructing the teachers how to use the county software for managerial, clerical, and time-saving tasks. In addition, if the definition of technology integration, as noted in chapter 1, is to enhance instruction and student learning, these

teachers also achieved some technology integration during the follow-up year after their training. All 10 projects that these teachers had their students create were enhanced by use of technology. These teachers' use of technology fluctuated across the stages of technology as replacement and technology as amplification (Hughes, 2000). These teachers moved through technology as replacement as they completed their clerical tasks and technology as amplification because the projects were enhanced or amplified by use of technology. However, none of the teachers moved to Hughes stage of technology as transformation (2000). The issue of technology transforming texts and what literacy is, is evident in the literature (Bruce, 1997; Leu, 1997; Leu, 2002a; Valmont & Wepner, 2000), but was not mentioned in any of the training sessions. The characteristics of hypertext, how to read hypertext, how to teach students to analyze websites, and how to critically evaluate Internet sources was not part of the TAFT course and, not surprisingly, was not part of the teachers' instruction when they went back to the classroom.

One reason the issue of technology as transformation might not have been addressed might be due to the fact that, the TAFT course was not subject area specific. This particular TAFT course that these teachers participated in had special education teachers, physical education teachers, guidance counselors, and other content area teachers in one setting. The TAFT course should be seen as an introduction to the county software and an introduction to a few lessons or projects that can be utilized in the classroom. Had the course focused more specifically on literacy education, this topic might have been more easily addressed. The section on implications for professional development in this chapter will address the issue of technology as transformation and the implications for language arts teachers.

*Technology Was Not Used To Its Fullest Potential*

While the participants did show enthusiasm and engagement in using technology, at the same time, technology was not always used to its fullest potential. All three participants said that restrictions on time kept them from integrating technology. Gavin said he had more instructional time with the students in the 1980s when there was not as much standardized testing. Now, when he takes the students to the media center to conduct research and use the computers, he gives up more instructional time. Gavin also believed that students already knew how to conduct research and find information so he did not need to take the time show them. Therefore, computer use was limited. Ashley stated that learning a new curriculum with new textbooks kept her from integrating more technology projects. Amber reiterated what both Gavin and Ashley said. With 1,000 pages to cover in the American Literature textbook, there was not much time to implement more technology projects. Gavin and Ashley were not able to show the PowerPoint presentation they created in TAFT because of time constraints. Gavin complained that although using technology might be nice to do, there was not enough time during the school year to add anything that takes up more time. Ashley reiterated by stating that she wanted to use technology to launch various units throughout the school year, but there were too many requirements to meet for the class so lack of time kept her from introducing the units in that manner.

This research extends previous research regarding barriers to implementing technology. Past studies have found lack of adequate teacher training and lack of time to develop lesson plans that integrate technology to be the greatest obstacle to integrating technology into the classroom (Hadley & Sheingold, 1993; Karchmer, 2000; Kinnaman,

1990). For example, Kinnaman's (1990) study found one of the barriers to be the lack of connection between what the trainer was teaching and how the teachers would integrate technology into the curriculum. TAFT did provide a connection between what was taught and how the teachers would use technology back in their classroom. The course was geared toward the specific hardware and software provided by the county and the TAFT course provided time to create content area specific lesson plans or projects. Time to create lesson plans was also one of the greatest obstacles in previous research to integrating technology (Hadley & Sheingold, 1993). These two researchers found that five of the top seven barriers from the past to be the same top five barriers today with time to develop lessons that incorporate technology in the top five in both instances. Again, TAFT addressed this issue. During the 50 hours of the TAFT course, teachers created three technology related lesson plans or projects to go with their curriculum. Instead of inadequate training and time to develop lessons, as previous researchers found to be obstacles, this particular study found that time to incorporate technology into the regular school day to be an obstacle. Although the subject specific plans had already been created, these teachers still felt there was a lack of space in their instructional time to allow them to deviate from their scheduled curriculum. For teachers to address this barrier in the future, professional development may need to help teachers realize technology lesson are not in addition to be added to the current curriculum, but rather are integral to the curriculum itself.

If teachers are going to transform the classroom into a technology rich environment, then they need to see that technology integration is not in addition to what they do every day or that they have to do something different. When technology is

transforming the classroom, it is part of their everyday teaching and learning process; it is how the content is communicated and explored. Technology should not be treated as a separate entity. Technology integration becomes a pedagogical infusion through the curriculum. The teachers felt they were giving up instructional time in order to integrate technology. The TAFT course did not show the teachers that technology integration involves reshaping, redesigning, and reconceptualizing how to teach and what to teach. The requirements for the TAFT course involved creating three lesson plans or projects and not the idea that technology integration can transform the classroom to change the reading, writing, and composing process in the language arts classroom. Literacy and technology were not connected for the participants in the course.

In addition to issues of time restrictions limiting technology use, other factors also inhibited technology integration. For instance, in a number of classrooms, hardware available to the teachers was not used. Included in the available, but unused hardware, were the scanners in the computer lab, all three classroom computers designated for student use, and a CD burner on one teacher's laptop that she did realize was there.

As the research of Schaffer and Richardson (2004) suggest, schools and training sessions are in the third phase of staff development which is software and technology integration. With this new phase, teachers are no longer being trained on hardware. This study may indicate, however, that the pendulum may have swung too far to the other side. Software is being taught now in isolation detached from the classroom. Those in charge of staff development may not realize what teachers experience when they try to integrate in the classroom. There has to be an awareness of the reality of integration when it occurs in the classroom and what the teachers might need. As this study showed, there

can ample hardware in the school building, but teachers may not know how to exploit it. The TAFT course focused on training with the county-wide software for managerial tasks and with implementing lesson plans and projects based on the county software, but it failed to provide instruction on the available hardware throughout the building.

In addition, some of the software programs that the teachers learned in TAFT were not exploited. The teachers created a basic spreadsheet with M&Ms in TAFT and a teacher web page. However, none of the participants used either resource after TAFT. They could not find a correlation between the software and the language arts classroom. This finding coincides with previous research that states that during teacher trainer there is often no connection made between what the trainer is teaching and how the teachers will integrate the lesson into the curriculum (Kinnamon, 1990; Reinen & Plomp, 1993). For a tool to be integrated effectively into the curriculum, subject specific examples may be needed to illustrate the value of a particular application.

Schools are often judged by how technology rich they are. Having various hardware and software is the first step to technology integration. However, if teachers do not know how to use the hardware, if they do not know the full potential of the available technologies, and if they view technology as an addition to their classroom, then money has been wasted.

#### *Technology Learned in a State-Mandated Course was Adopted and Diffused*

Most components of TAFT were adopted and adapted into the curriculum. The use of Word, Publisher, PowerPoint, and the county databases were used in the classroom after the TAFT class was completed. The adoption of technology seemed to be the first step in technology integration and showed that teachers either saw the benefit

or were interested in using technology. Once the teachers had mastered several of the elements of a technology, then they were able to adapt the technology to fit their needs. The teachers themselves did not have to be the ones to utilize the technology, instead they were able to adapt their technological skills and have the students incorporate technology into their projects.

Only two components, spreadsheets and web pages were not adopted in any of the language arts classrooms after TAFT. There were several components that the teachers were already familiar with before enrolling in TAFT. All teachers manipulated Lotus Notes for email and they knew how to access the assessment database, although only two used the database.

Rogers' (1995) Theory of Perceived Attributes can be used to describe why technology was adopted and adapted or not adopted. Rogers stated that adopters would judge an innovation based on five attributes and then decide if the innovation should be adopted. In this case, teachers would evaluate technology integration into the classroom in terms of trialability, observability, relative advantage, complexity, and compatibility. The three participants enrolled in TAFT were able to use the software to practice during the class and to observe the instructor using the software. Therefore, trialability and observability were met in the course in that aspect. However, the teachers were not able to implement a technology-related lesson in their classroom and discuss the lesson with the instructor or their peers before the TAFT class was completed. This would have been helpful because the TAFT classroom setting is much different from the regular English Language Arts classroom of 30 students. It is one thing to observe your instructor and to participate as a student, but it is entirely different when the teacher is now the instructor

in a room full of students with varying levels of technology experience. They also were not able to observe other teachers in classrooms using technology as part of their instruction. This piece of knowledge provides implications for future professional development. Would these teachers have integrated more technology in their lessons if they had been able to implement the lesson and then talk about it with peers in the TAFT course? Would these teachers have been more comfortable integrating technology if they had observed a Language Arts teacher using technology in her classroom?

In relative advantage, the rate of adoption is influenced by the benefits outweighing the cost. Gavin and Ashley felt that they could teach without technology and that the students could be just as successful when technology was not used. However, throughout the year, it became apparent that there were many instances that using technology created an advantage for not only the teachers, but the students as well. There was a relative advantage for both Ashley and Amber to integrate technology because they held the belief that teachers needed to prepare students for the 21<sup>st</sup> century. They integrated technology in their classroom because they thought it would be a disservice to the students not to incorporate technology. Because society is technologically advanced, Ashley and Amber agreed that teachers need to be up-to-date on technology and to create a technology-rich classroom. This finding is consistent with Adams (2000) and Ray (2001) who stated that students need to become effective users of technology because of technological world challenges. Also, Swenson et al. (2006) and Zhao et. al (2002) stated that teachers need to understand the benefits and detriments of their technology integration. For example, Ashley and Amber were willing to give up

instruction time in order to incorporate more technology-related projects because of student interest and academic success.

All three participants agreed that technology was a tool for teachers and students. Gavin acknowledged the benefits of technology through the additional avenue of creativity of Hypersnap or organizing anecdotes that technology could provide. Ashley and Amber also found several advantages to integrating technology in the classroom. Those beliefs outweighed any negative aspects for technology integration, and that was why they developed technology rich environments for their students.

Complexity, Rogers' fourth attribute, referred to the difficulty involved in the integration. Gavin and Ashley did not use the PowerPoint presentations that they had made because of the difficulty in setting up the equipment. Also, Ashley and Amber were not able to use an available scanner because they did not understand how to use the equipment. It seems that the teachers were more worried about technical difficulties instead of pedagogical difficulties. Although there were support staff in the school, these individuals were not in the lab when lessons were taking place. Having a support person in the computer lab with the teachers and students may help to eliminate the issues of complexity.

None of participants incorporated spreadsheets or web design in their classroom. They did not see those two applications being compatible with the language arts classroom. This study is consistent with Isleem's (2003) and Reichstetter's (1999) studies of teachers using computers for instructional purposes, where they found high levels of mainstream software use, but low levels of specialized software use. The language arts participants in this study did not use the specialized software for

spreadsheets or web design. Teachers who do not see compatibility between software applications and their curriculum will not integrate the technology.

The results of this study extend the work of Bussey, Dormody, and VanLeeuwen (2000) who identified the factors that influenced the adoption process. Their research indicated that three of Rogers' (1995) attributes were predictors for the level of a technological adoption. Their study found that relative advantage, compatibility, and observability were the specific attributes. This study found that all five attributes impacted technology integration.

Those who develop future professional development courses will need to take all five attributes into consideration when planning for teacher training. Teachers must be able to try and observe the technology in the actual classroom setting. They must see the advantage to integrating technology over the way they have been teaching. Teachers need guidance through more instruction or user manuals to learn all aspects of using the technology available to them. Finally, future courses should demonstrate how specialized software can be used in the classrooms of each discipline and course developers should consider the benefits of separating courses by discipline so that teachers can see direct correlation between what they are learning and what they teach.

#### *Technology Use was Affected by the Participants' Stance Toward Literacy and Technology*

Bruce (1997) suggested that a teacher's stance determined how technology would be used in the classroom. He said that how teachers perceive technology would influence how technology is used in the classroom. My findings coincide with this research. All three participants had a different stance towards literacy and technology, and all used

technology to varying degrees. Interestingly, the findings showed that the participants had dual stances at the same time and in one case, the stances were dichotomous with each other. Gavin was resentful and ambivalent towards technology, although his resentfulness was aimed towards the many ways that technology could be used to meddle in his classroom and not directed towards the applications of technologies. Gavin believed that technology has allowed politicians, school board members and parents to critique teacher performances and student achievement through the use of standardized testing, which demonstrate nothing more than the students ability to “vomit” back a teacher’s lesson. This professional resentfulness must be kept in mind when analyzing Gavin’s uses of technology because it has created a prejudice in his mind, but it did not prevent him from utilizing technology. Interestingly, his ambivalence may have been a greater obstacle in his desire to use technology because Gavin believed that technology was simply not needed to do his job. Gavin believed that aspects of technology could be fun to use in class, like pictures of literary authors, but these were not necessary. His goal throughout the year was to teach his students to think, and technology did not aid him in that objective. Instead, technology use required that he give up valuable class time with his students, and he could not see any reason to waste valuable time, other than the single assignment that he performed to fulfill his technology requirements. Teachers like Gavin view technology as a tool that can be learned outside of class and applied as necessary. The notion that technology advances results in new literacy studies or a concept to be taught is not an issue.

In looking at the ACOT Model (Dwyer et al., 1991) Gavin appears to be in the entry stage of technology integration and making no attempt to move past that stage.

Although he is not having discipline problems, organizational obstacles, or personal frustration when he is incorporating technology, he still prefers to use traditional methods of teaching. He is very satisfied with what he accomplishes in his classroom and does not feel the need to change his teaching style. His students are successful whether or not he uses technology. Gavin's professional resentfulness toward technology is probably not going to change. However, through effective professional development the ambivalence felt by Gavin and teachers like him might change. If teachers can be shown how technology can enhance language arts instruction with specific examples and if they can be shown how easily traditional lessons could be transformed to integrate technology so that they do not have to give up instructional time, their ambivalence may change to a more positive approach to integrating technology.

Ashley, another participant, had dichotomous stances of enthusiasm and fearfulness. She enthusiastically implemented three technology projects created for the TAFT class and would have liked her students to design two more, but the time in learning a new curriculum prevented her from doing so. She allowed her students to use the software program with which they were most comfortable or the program they wanted to learn more about. They were able to choose Word, PowerPoint, or Publisher. In all of these instances, where enthusiasm was apparent, her students were the ones to use the technology. When Ashley was to use the technology in front of her students, however, fearfulness took over. With no instructional manual in the language arts computer lab, Ashley was unsure of how to use the scanner. When a couple of students wanted to use the scanner, Ashley told them they would have to scan at home. Ashley did not show the PowerPoint presentation she created in TAFT to her students because of

her uncertainty of connecting all the cables. Ashley also changed an assignment replacing a PowerPoint presentation with a paper display because she was afraid of setting up the equipment incorrectly in front of her students.

Having two stances that were dichotomous of each other created internal turmoil for Ashley. On one hand she was enthusiastic about implementing technology in her classroom, and she developed several technology related projects for her students. However, conflicting with Ashley's eagerness to implement technology was her fearfulness of making a fool of herself in front of her students. This negative stance of fearfulness prevented her from integrating technology in her classroom to the fullest extent. She handed out paper instructions instead of modeling for the students how to use the technology. This fearfulness also limited the number of times she incorporated technology because she did not want to demonstrate using technology in front of her students in case she made a mistake, and she prevented her students from using technology because she was afraid to try to set up the equipment for them to show their presentations.

Ashley seems to be at the adoption stage of the ACOT Model (Dwyer et al., 1991). To help Ashley and other teachers like her who are enthusiastic about using technology, but who are fearful of doing something wrong with technology, professional development could offer instruction on the different pieces of hardware available at the school. This may help the teachers move into the next stage which is adaptation. To help these teachers gain confidence in using the hardware, they should be allowed to see how the equipment works, to review an instruction manual, and to learn about the most common trouble shooting suggestions. Professional development could provide time for

the teachers to set up and disconnect the equipment. More specifically, the course could ask the teachers to form small groups to present a demonstration on the equipment to the class. Currently, Carthage Central High School has LCD projectors, digital cameras, camcorders, and scanners for the teachers to use. Each group could demonstrate how each of these pieces of equipment are used and how they could be integrated into a lesson.

Amber, the last participant was enthusiastic and eager to use technology in the language arts classroom. Her stances did not conflict with each other and paired together allowed her to integrate six technology projects into her classroom. Amber eagerly went back to her classroom even before the TAFT course completed to implement a PowerPoint technology project on the 1930s. Then she went on to integrate five more technology projects throughout the school year. Her enthusiasm was apparent when she described the outcome of her assignments. She emphasized that the success of the project was strictly due to use of the computer.

Amber seems to be in the appropriation stage and could possibly move into the invention stage with some ongoing professional development. A more advanced technology course offered to teachers who have already demonstrated knowledge of basic skills and who have already integrated technology classroom could help teachers like Amber to implement more technology lessons and projects and more advanced lessons. These courses could also demonstrate how to make the connection between some of the software programs that are not usually used in language arts, such as Excel and websites, and the language arts classroom. In the invention stage, teachers often use portfolios to

assess student work. The use of portfolios was not mentioned in the TAFT class. This could be something that a more advanced professional development course could exhibit.

Bruce (1997) describes language arts teachers as being somewhere along a continuum in regards to their stance towards technology and how technology fits into the reading and writing process. If ambivalence is thought of as neutral stance, then resentment would be at one end of the spectrum and enthusiasm at the other. Ashley's dichotomous stances would place her somewhere in the middle. This may explain why Gavin integrated one technology project, Ashley incorporated three technology projects, and Amber implemented six technology projects.

*Technology Use was Affected by the Participants' Perceptions of Literacy and Technology*

At the beginning of the school year, the participants filled out a survey so that I might understand their perceptions and views of how literacy and technology work together. I incorporated Bruce's (1997) list of seven stances toward technology (Appendix B) to obtain this information. The seven stances include (a) neutrality where teachers see no advantage or disadvantage to integration, (b) opposition where teachers are resistant to technology, (c) utilitarian where teachers see technology as a marvelous tool for teaching and learning literacy, (d) skeptical where teachers do not see dangers with technology, but they do not see the marvels either, (e) transformational where they believe technology will radically transform the nature of literacy, (f) aesthetic where teachers see rich opportunities for creativity with technology, and (g) transactional where they see literacy and technology transacting with each other and are not separate entities.

Depending on the stance that the teachers in this study embraced, determined how much technology was incorporated into the classroom.

The findings from the survey coincide with Bruce (1997) and Young and Bush (2004). How the teachers perceived technology's relationship with literacy influenced the amount of computer use in the classroom and how they approached the teaching of literacy. Gavin's perception of technology in relation to literacy was oppositional and negative. He only used the technology that was required of him through the county and only had his students complete one technology related project. Ashley and Amber perceived technology to have a transactional relationship with literacy. They saw technology and literacy as one and created student activities with rich opportunities for learning.

The results of this study provided an insight into the ways high school language arts teachers integrate technology after participating in a state-mandated technology professional development course and added to the body of research knowledge. Learning technology created engagement and enthusiasm for all participants. All teachers incorporated technology into their classroom after participating in a technology course. However, their stance, perceptions of literacy and technology and their perceptions of Rogers' (1995) five attributes determined to what extent technology integration took place.

#### *Recommendations for Future Research*

More in-depth studies are needed that examine the impact of professional development in the classroom and the effect of technology integration on students' learning. The purpose of professional development is to help teachers learn and

implement new strategies in the classroom to support student instruction. Once teachers have learned new strategies and they implement them in their curriculum, it is imperative to find out if the new approaches are effective. Therefore, a line of inquiry would be to assess the students' level of engagement or the impact of technology on student achievement after teachers have taken a state-mandated class, as well as the students' perceptions of technology use in the classroom.

A second area for future research would be to explore other county programs similar to TAFT. Research should compare TAFT to other county programs in that particular state where technology was a requirement for recertification to determine the most effective means to reach the state-mandated goals. This study could also be repeated with a larger sample size. In a larger research study with more participants, the results might show a greater variety of technology integration or other reasons for adopting or not adopting the technologies in an ordinary high school language arts classroom. A broadened replication of this study to include elementary school teachers and middle school teachers may provide information pertaining to their specific reasons for adopting and not adopting available technologies.

#### *Implications for Professional Development*

Professional development programs have the greatest influence on the methods of instruction that teachers use in the classroom (Goodlad, 1994). How teaching is conducted in the classroom is a reflection on the training they have received (Bauer & Kenton (2005). This study offered important implications for future professional development programs to prepare teachers to effectively integrate technology into their

existing curriculum. Future professional development programs might address the following recommendations for optimal technology integration.

First, teachers need to be supported as they implement the software into their classroom throughout the professional development course instead of at the end of the training. This might enable teachers to trouble shoot any problems before the course is over and to have feedback from the instructor and peers before the teachers are left to their own devices. They could also observe other same subject area teachers implementing technology in their classroom and observe them using specialized software so that they can see the compatibility between the software and their classroom. Adams's (2000) emphasized the need for teachers to "...observe other teachers modeling a variety of effective uses of computers in high school language arts classroom" (p. 97). These "model" teachers could also offer support as they attempt technology integration. Previous research has found that support from colleagues is a predictor in successful integration of a technology (Blankenship, 1998; Hoerup, 2001; Jacobsen, 1998).

Second, professional development in technology should take into account the ability levels and teaching positions of the participants. The training developers at each school could conduct a needs assessment to obtain information about the ability levels of the participants, as Carrier and Glenn (1991) suggest, as well as what county mandated software and other applications with which they are already familiar. Training could also be content specific. For example, high school English teachers could receive training that emphasizes what technologies correlate with the stories they read in class. Similarly, elementary school teachers could receive training on applications that are appropriate for

younger students. A performance assessment at the end of training should be conducted to see if the training was effective.

Third, training developers should also consider the nature of training as training impacts the nature of the implementation. Research has stressed the importance of evaluating the accuracy of Internet material and discussing how reading and writing is influenced by use of the Internet (Karchmer, 2001). Her study showed that high school teachers found it necessary to teach students how to evaluate the information found on the Internet. They discussed the importance of assessing information, and they developed criteria so that they could weigh the accuracy of the information on their own. The teachers in her study also expressed that the Internet helped to reinforce the students' reading because the interactivity available on the Internet captured the students' interests much more than traditional texts do. When links and digitized speech are available on the Internet, students are more likely to read the entire passage and comprehend better than when books are used.

One of the instructors of TAFT did demonstrate how to evaluate websites. The instructor provided a lesson about a website that discussed tree octopi. There is no such animal as a tree octopus, but the website provided information about the animal and even provided pictures. Although the instructor went over strategies on how to evaluate a website, this lesson lasted only one hour and did not show the teachers how to use evaluation techniques with students.

Therefore, the teachers in this study did not mention the importance of evaluating websites, nor did I observe the teachers talking to their classes about how to assess a website when they conducted their research for the technology projects. When students

use books as resources, they often assume that because the books are published, they must be fair and accurate. While this could be problematic with published texts, the difficulties are compounded when students apply this same logic to what they find on the Internet. Students typically give the material on the Internet the same value that they would a traditional text book which has gone through some degree of professional review for content accuracy. The teachers in Karchmer's (2001) study did find inaccurate information on a few websites. Therefore, it is important to add this component to lessons when allowing students to conduct research on the Internet.

The participants in this study also did not seem to be concerned about how hypertext documents change the way students read material or if they respond better to text on the Internet as opposed to traditional texts. The difficulties of reading these diverse materials have been addressed in the literature (Charney, 2001; Kinzer & Leu, 1997; Leu, 2002a; Many, 2000). When I observed the teachers, they did not discuss the difference between a hypertext document and reading a book with the students. There was no instruction into an awareness of new of different instructional strategies needed in order to use the Internet. This is because none of the instructors for TAFT taught the teachers how to read hypertext documents or how to teach their students for reading non-traditional print. Because digital texts allow the reader to link on different links, the reading process is no longer linear and students need to be taught this new concept of reading. Students also have access to audio and video on the Internet and need to know to how and when to use these learning strategies. The three participants in this study did not incorporate the teaching of website evaluation or the teaching of how to read information on website. Previous research has demonstrated that language arts teachers

need to embrace a wider range of literacies and teach with different texts in order to prepare students to become effective users in a technological society (Adams, 2000).

Therefore, professional development courses should also emphasize website evaluation and strategies for reading hypertext documents.

Finally, schools should ensure the support they offer for technology integration is effective. The school in the study did have support staff, but teachers still failed to use technology because there was a lack of support materials, and they failed to use the assistance that was available. Schools need to ensure that support manuals are available for both hardware and software. Manuals could be stored in one central location like the media center, and teachers could borrow them when needed. They could also hire a support person to be available in the computer labs to assist teachers with hardware or software issues. Having peer support while implementing technology could increase the teachers' confidence and they might be more willing to schedule time in a computer lab knowing that there is assistance if needed. Schools could also ensure that teachers are trained not only on the software that is available at the schools, but the hardware as well.

The above suggestions would ensure that the professional development courses replacing experiences like TAFT in future years would be more effective. However, the most important implication is that schools should provide leadership for ongoing professional development which would encourage more and different types of technology integration. For effective technology integration and for classrooms to be transformed by technology, professional development needs to be long-term and on-going. One 50-hour course is not enough for teachers to transform their classrooms into technology-rich environments.

## CONCLUSION

Students must master technological literacy if they are to compete and be successful in a technological society. Teachers must be prepared to use technology in their classroom to prepare students to be technologically literate. In order for that to happen, professional development must meet the needs of the teachers as integrating technology encompasses many aptitudes. Teachers not only must understand their subject area, but how technology extends their curriculum and how to incorporate technology into their lesson plans. The notion that technology extends beyond technology as tool and that technology is changing what text is and what literacy is, is an important concept. For example, the teachers in Hughes' (2000) study had students write a hypertext story and invited peer collaboration through email, thus transforming student learning. The teachers in this study utilized the computer as a tool to produce student work, but did not employ the computer to help transform literacy instruction. Although two of the participants believed that technology is changing literacy, their instructional practices did not reflect the notion of technology transforming literacy. This was apparent by the very fact that the teachers could distinguish an individual technology lesson that they had planned ahead of time as opposed to technology integration being ongoing throughout the year.

The present study featured a small sample of high school language arts teachers who implemented technology after participating in a state-mandated technology professional development course. The results of the study showed that technology integration is happening and that teachers are engaged and enthusiastic when they use technology in the classroom. However, technology implementation did not meet its

fullest potential because of restrictions on time, lack of knowledge on how to use the equipment, perceived attributes, and perceptions of technology.

## References

- A Plus Education Reform Act of 2000. (2000). Retrieved August 9, 2002, from <http://ganet.org/services/leg/ShowBillPre.cgi?year=1999&filename=1999/HB1187>
- Adams, D. K. (2000). Teachers, technology and the high school language arts classroom: A digital case study. (Master of Arts Degree, Simon Fraser University, 2000).
- Al-Gahtani, S. S. (2003). Computer technology adoption in Saudi Arabia: Correlates of perceived innovation attributes. *Information Technology for Development, 10*, 57-69.
- Anderson, M. A. (2004). Summer school for teachers: Creating technology workshops is easier than you expect. *School Library Journal, 50*(2), 36-37.
- Bailey, G. D., & Lumley, D. (1994). *Technology staff development programs: A leadership sourcebook for school administrators*. New York, NY: Scholastic Inc.
- Baker, E. A. (2001). The nature of literacy in a technology-rich fourth-grade classroom. *Reading Research and Instruction, 40*, 159-184.
- Baker, E. A. (2003). Integrating literacy and technology: Making a match between software and classroom. *Reading & Writing Quarterly, 19*, 193-197.
- Bauer, J., & Kenton, J. (2005). Toward technology integration in the schools: Why it isn't happening. *Journal of Technology and Teacher Education 13*(4), 519-546.
- Beaver, J. W. (1992). Training teachers to organize and design computer video projects. In D. Carey, R. Carey, D. Willis, & J. Willis (Eds.), *Technology and teacher education annual*

- (pp. 285-288). Charlottesville, VA: Association for the Advancement of Computing in Education.
- Bebell, D., Russell, M., & O'Dwyer, L. (2004). Measuring teachers' technology uses: Why multiple-measures are more revealing. *Journal of Research on Technology in Education*, 37(1), 45-63.
- Becker, H. J. (2000). Pedagogical motivations for student computer use that lead to student engagement. *Educational Technology*. September-October, 5-17.
- Becker, H. J. (1998). Running to catch a moving train: Schools and information technologies. *Theories into Practice*, 37(1), 20-30.
- Becker, H. J., Ravitz, J., & Wong, Y. T. (1999). Teacher and teacher-directed student use of computers and software. Retrieved November 16, 2004, from [http://www.crito.uci.edu/tlc/findi...omputerUse/html/body\\_startpage.htm](http://www.crito.uci.edu/tlc/findi...omputerUse/html/body_startpage.htm).
- Bellanca, J. (1995). *Designing professional development for change*. Palatine, IL: IRI/Skylight Publishing, Inc.
- Bhola, H. S. (1984). Planned educational change: A model of critiques thereof. *Viewpoints in Teaching and Learning*, 58(4), 17-34.
- Blankenship, S. E. (1998). Factors related to computer use by teachers in classroom instruction. (Doctoral Dissertation, Virginia Polytechnic Institute and State University, 1998).
- Bogdan, R. C., & Biklen, S. K. (1992). *Qualitative research for education: An introduction to theory and methods*. Boston: Allyn & Bacon.
- Bowman, C. A. (2000). Infusing technology-based instructional frameworks in the methods courses: A response to Pope and Golub. Retrieved July 17, 2006 from <http://www.citejournal.org/vol1/iss1/currentissues/english/article2.htm>

- Brackett, M. H., Henry, G. T., & Weathersby, J. (1999). *Report on the expenditures of lottery funds*. Atlanta: The Council for School Performance.
- Brand, G. A. (1998). What research says: Training teachers for using technology. *Journal of Staff Development, 19*(1), 10-13.
- Brooks, D., & Kopp, T. W. (1990). Technology and teacher education. In W. R. Houston (Ed.), *Handbook of research on teacher education* (pp. 498-513). New York: Macmillan.
- Bruce, B. C. (1997). Critical issues literacy technologies: What stance should we take? *Journal of Literacy Research, 29*, 289-309.
- Bruce, B. C., & Rubin, A. (1993). *Electronic quills: A situated evaluation of using computers for writing in classrooms*. Hillsdale, NJ: Erlbaum.
- Brzycki, D., & Dudt, K. (2005). Overcoming barriers to technology use in teacher preparation programs. *Journal of Technology and Teacher Education, 13*(4), 619-641.
- Bush, G. W. (2002). No child left behind. Retrieved August 9, 2004, from <http://www.nochildleftbehind.gov.html>
- Bussey, J. M., Dormody, T. J., & VanLeeuwen, D. (2000). Some factors predicting the adoption of technology education in New Mexico public schools. *Journal of Technology Education, 12*(1), 4-17.
- Carrier, C., & Glenn, A. (1991). The status and challenge of technology training for teachers. In T. M. Shlechter (Ed.), *Problems and promises of computer-based training* (pp. 77-98). Norwood, NJ: Ablex.
- Carrier, C., Glenn, A., & Sales, G. (1985). A two level program for training teachers to use computers in the classroom. *Educational Technology, 25*(10), 18-23.

- Charney, D. (2001). The effect of hypertext on processes of reading and writing. In E. Cushman, E. R. Kintgen, B. M. Knoll, & M. Rose (Eds.), *Literacy: A critical sourcebook* (pp. 85-103). Boston, MA: Bedford/St. Martin's.
- Constanzo, W. (1994). Reading, writing, and thinking in an age of electronic literacy. In C. L. Selfe, & S. Hilligoss (Eds.), *Literacy and computers: The complications of teaching and learning with technology* (pp. 11-22). New York, NY: Modern Language Association of America.
- Cradler, J. (2002). Learning and leading with technology. *ISTE Journal of Educational Technology*, 29(7), 46-49.
- Criscione, C. L. (2005). An evaluation of technology staff development courses for the levels of technology use by teachers in nonpublic schools. (Doctoral dissertation, St. John's University, 2005).
- Cuban, L. (2004). So much high-tech money invested, so little use: How come? Retrieved June 1, 2005, from <http://www.edtechnot.com/notarticle1201.html>
- Cuban, L. (2001). *Oversold and underused: Computers in the classroom*. Cambridge, MA: Harvard University Press.
- Cunningham, J. W. (2000). How will literacy be defined in the new millennium? *Reading Research Quarterly*, 35 (1), 64-72.
- Deacon, C. R. (1999). The effect of computer access and subject area on the level of teacher implementation of technology. (Doctoral dissertation, Seton Hall University 1999).
- Deal, W. F. (2002). Making the connection: Technological literacy and technology assessment. *Technology Teacher*, 61(7), 16-22.

- Denzin, N. K., & Lincoln, Y. S. (1994). Methods of collecting and analyzing empirical materials. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 353-360). Thousand Oaks, CA: Sage Publications.
- Dias, L. B. (2000). Best practices of technology integrating teachers: Pictures of practice from four elementary classrooms. (Doctoral dissertation, Georgia State University, 2000).
- Downes, T., & Fatouros, C. (1995). *Learning in an electronic world: Computers and the language arts classroom*. Portsmouth, NH: Primary English Teaching Association.
- Dwyer, D., Ringstaff, C., & Sandholtz, J. (1991). Changes in teachers' beliefs and practices in technology-rich classrooms. *Educational Leadership*, 48(8), 45-54.
- Ertmer, P. A., Addison, P., Lane, M., Ross, E., & Woods, D. (1999). Examining teachers' beliefs about the role of technology in the elementary classroom. *Journal of Research on Computing in Education*, 32(1), 54-72.
- Farquhar, J. D., & Surry, D. W. (1994). Adoption analysis: An additional tool for instructional developers. *Educational & Training Technology International*, 3(1), 19-25.
- Fullan, M. (1985). Change process and strategies at the local level. *The Elementary School Journal*, 85, 391-421.
- Gall, M. D., & Renchler, R. S. (1985). *Effective staff development for teachers: A research based model*. University of Oregon, Clearinghouse on Educational Management College of Education, Eugene.
- Garet, M. S., Porter, A. C., Desimone, L., Birman, B. F., & Yoon, K. S. (2001). What makes professional development effective? Results from a national sample of teachers. *American Educational Research Journal*, 38(4), 915-945.

- Gess-Newsome, J., Blocher, J. M., Clark, J., Menasco, J., & Willis, E. M. (2003). Technology infused professional development: A framework for development and analysis. *Contemporary Issues in Technology and Technology Education, 3*(3), 324-340.
- Ginsberg, R., & McCormick, V. (1998). Computer use in effective schools. *Journal of Staff Development, 19*(1), 22-25.
- Glaser, B., & Strauss, A. (1967). *The discovery of grounded theory*. Chicago: Aldine.
- Glenn, A., & Carrier, C. (1989). Teacher education and computer training: An assessment. *Peabody Journal of Education, 64*(1), 67-79.
- Goals 2000: Educate America Act (1994). H. R. 1804, 103 Congress., 2<sup>nd</sup> Session. Retrieved April 15, 2003 from <http://www.ed.gov/legislation/GOALS2000/TheAct/>.
- Goodlad, J. I. (1994). *Educational renewal: Better teachers, better schools*. San Francisco: Jossey-Bass.
- Grabe, M., & Grabe, C. (1998). *Integrating technology for meaningful learning*. (2<sup>nd</sup> Edition), Boston: Houghton Mifflin.
- Grant, C. M. (2000). Professional development in a technological age: New definitions, old challenges, new resources. Retrieved January 12, 2006 from [http://ra.terc.edu/alliance/TEMPLATE/alliance\\_resources/reform/tech-infusion/prof\\_dev/prof\\_dev\\_intro.html](http://ra.terc.edu/alliance/TEMPLATE/alliance_resources/reform/tech-infusion/prof_dev/prof_dev_intro.html)
- Hadley, M., & Shiengold, K. (1993). Commonalities and distinctive patters in teachers integration of computers. *American Journal of Education, 101*(3), 261-315.
- Hall, G. E., & Hord, S. M. (1987). *Change in schools*. Albany, NY: SUNY Press.
- Hall, G. E., & Hord, S. M. (2001). *Implementing change: Patterns, principles, and potholes*. Boston, MA: Allyn and Bacon.

- Harvey, J., & Purnell, S. (1995). Technology and teachers' professional development. Report prepared for the Office of Educational Technology, U. S. Department of Education. Santa Monica, CA: Rand Corporation.
- Hinton, R. W. (2003). The Georgia lottery: Selected summary financial information from inception. Report Issued by the State of Georgia Department of Audits and Accounts.
- Hoerup, S. L. (2001). Diffusion of an innovation: Computer technology integration and the role of collaboration. (Doctoral Dissertations, Virginia Polytechnic Institute and State University, 2001).
- Hughes, J. E. (2000). Teaching English with technology: Exploring teacher learning and practice. (Doctoral dissertation, Michigan State University, 2000).
- Ingram, J. M. (1992). Who's teaching the teacher: Elementary education and the computer. *Journal of Computing in Education*, 8(3), 17-30.
- International Reading Association (2002). Integrating literacy and technology in the curriculum: A position statement of the International Reading Association. Newark, DE.
- Isleem, M. (2003). Relationships of selected factors and the level of computer use for instructional purposes by technology education teachers in Ohio – A statewide survey. (Doctoral Dissertation, Ohio State University, 2003).
- Jacobsen, D. M. (1998). Characteristics and adoption patterns of faculty who integrate technology into teaching and learning in higher education (Doctoral Dissertation, University of Calgary, 1998).
- Jonassen, D. H., & Reeves, T. C. (1996). Learning with technology: Using computers as cognitive tools. In D. H. Jonassen (Ed.), *Handbook of research for education*

- communications and technology* (pp. 693-719) New York: Simon and Schuster Macmillan.
- Jonasson, H. G. (1993). Effective schools link professional development, teacher supervision, and student learning. *The Canadian School Executive, 12*(8), 18-21.
- Kanaya, T., Light, D., & Culp, K. M. (2005). Factors influencing outcomes from a technology-focused professional development program. *Journal of Research on Technology in Education, 37*, 313-329.
- Kaplan, N., & Moulthrop, S. (1991). Something to imagine: Literature, composition, and interactive fiction. *Computers and Composition, 9*, 7-23.
- Karchmer, R. A. (2001). The journey ahead: Thirteen teachers report how the Internet influences literacy and literacy instruction in their K-12 classrooms. *Reading Research Quarterly, 36*, 442-466.
- Ketterer, K. A. (2000). Second language immersion, integrated curriculum, constructivism, and information technology: A case study of the blending of frames through the lens of information technology. (Doctoral dissertation, University of Oregon, 2000).
- Kincheloe, J. L., & McLaren, P. (2000). Rethinking critical theory and qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (2nd ed., pp. 279-314). Thousand Oaks: Sage Publications, Inc.
- Kinnaman, D. E. (1990). Staff development: How to build your winning team. *Technology and Learning, 11*(2), 4-6.
- Kinzer, C., & Leu, D. J., Jr. (1997). Focus on research the challenge of change: Exploring literacy and learning in electronic environments. *Language Arts, 74*, 126-135.

- Labbo, L. D., Reinking, D., & McKenna, M. C. (1998). Technology and literacy education in the next century: Exploring the connection between work and schooling. *Peabody Journal of Education*, 73(3&4), 273-289.
- Lankshear, C., & Knobel, M. (1997). Literacies, texts, and differences in the electronic age. In C. Lankshear (Ed.), *Changing literacies* (pp. 134-163). Buckingham, UK: Open University Press.
- Leu, D. J., Jr. (2002a). The new literacies: Research on reading instruction with the Internet and other digital technologies. In J. Samuels and A. E. Farstrup (Eds.). *What research has to say about reading instruction*. Newark, DE: International Reading Association.
- Leu, D. J., Jr. (2002b). Our children's future: Changing the focus of literacy and literacy instruction. Retrieved July 16, 2002, from <http://www.readingonline.org/electronic/RT/focus>
- Leu, D. J., Jr. (1997). Caity's question: Literacy as deixis on the Internet. *The Reading Teacher*, 51(1), 62-67.
- Leu, D. J., Jr., Kinzer, C. K., Coiro, J. L., & Cammack, D. W. (2004). Toward a theory of new literacies emerging from the Internet and other information and communication technologies. In R. Ruddell & N. Unrau, *Theoretical models and processes of reading* (5<sup>th</sup> ed., pp. 43-60). Newark, DE: International Reading Association.
- Leu, D. J., Jr., Mallette, M., & Karchmer, R. (2001). New literacies, new technologies, and new realities: Toward an agenda for the literacy research community. *Reading Research and Instruction: Themed Issue on Literacy and Technology*, 40, 265-272.

- Lewis, T. (1999, Spring). Research in technology education – some areas of need. *Journal of Technology Education*. 10(2). Retrieved May 19, 2005, from <http://scholar.lib.vt.edu/ejournals/JTE/v10n2/lewis.html>
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage.
- Littrell, A. B., Zagumny, M. J., & Zagumny, L. L. (2005). Contextual and psychological predictors of instructional technology use in rural classrooms. *Educational Research Quarterly*, 29(2), 37-47.
- Ludwig, M. & Taymans, J. (2005). Teaming: Constructing high-quality faculty development in a PT3 project. *Journal of Technology and Teacher Education*, 13, 357-372.
- Luke, C. (2000). Cyber-schooling and technological change: Multiliteracies for new times. In B. Cope & M. Kalantzis (Eds.), *Multiliteracies: Literacy learning and the design of social futures* (pp. 69-91). London: Routledge.
- Many, J. E. (2000). How will literacy be defined in the new millennium? *Reading Research Quarterly*, 35 (1), 64-72.
- Marsh, E. J. (1992). An evaluation of the outreach program of an ACOT teacher development center (Doctoral dissertation, George Peabody College for Teachers of Vanderbilt University, 1992).
- Martin, R. T. (1990). The effect of in-service computer education on computer use by selected secondary teachers (Doctoral dissertation, University of Alabama).
- McEneaney, J. E. (2003). Does hypertext disadvantage less able readers? *Journal of Educational Computing Research*, 29(1), 1-12.
- Merriam, S. B. (1998). *Qualitative research and case study applications in education*. San Francisco, California: Jossey-Bass.

- Milken Exchange on Education Technology. (1999). *Will new teachers be prepared to teach in a digital age? A national survey on information technology in teacher education*. Santa Monica, CA: Author. Retrieved April 4, 2003, from <http://www.mff.org.publications>.
- Moore, P. (1996). Reading and writing the internet. In J. Hancock (Ed.), *Teaching literacy using information technology* (pp. 48-56). Australian Literacy Educators' Association.
- Murray, J., & Kinnick, N. C. (2003). Contemporary literacy: Essential skills for the 21<sup>st</sup> century. *Multimedia Schools*, 10, 14-19.
- National Center for Educational Statistics (NCES) (2000). Teachers' tools for the 21<sup>st</sup> century: A report on teacher use of technology, U. S. Department of Education. Office of Educational Research and Improvement. Washington, DC: Retrieved August 12, 2005 from <http://nces.ed.gov/pubsearch/pubinfo.as?pubid=2000102>
- National Educational Technology Standards (2002). Retrieved August 22, 2002, from [http://cnets.iste.org/intro\\_splash.htm](http://cnets.iste.org/intro_splash.htm).
- Nonis, A. S. (1999). Understanding teachers' experiences of a state mandate to provide technology training: An examination of policy implementation. (Doctoral dissertation, University of Virginia, 1999).
- Norman, M. M. (2000). The human side of school technology. *Education Digest*, 65(7), 45-53.
- O'Bannon, B., & Judge, S. (2004-2005). Implementing partnerships across the curriculum with technology. *Journal of Research on Technology in Education*, 37(2), 197-213.
- Office of Planning (2002). Gwinnett County Public School System.
- Orlich, D. C. (1989). *Staff development: Enhancing human potential*. Needham Heights, MA: Allyn and Bacon.

- Patton, M. Q. (1990). *Qualitative evaluation and research methods* (2<sup>nd</sup> ed.). Thousand Oaks, CA: Sage Publications.
- Peck, C., Cuban, L., & Kirkpatrick, H. (2002). Techno-promoter dreams, student realities. *Phi Delta Kappan*, 83(6), 472-481.
- Pelgrum, W. J., & Plomp, T. (1993). *The IEA study of computers in education: Implementation of an innovation in 21 education systems*. Tarrytown, NY: Pergamon Press.
- Pew Internet and American life (2001). Retrieved August 22, 2002, from <http://www.pewinternet.org/report...ReportLevel1&Field=Level1ID&ID=292>
- Policies Commission for Business and Economic Education. (1993). This we believe about the role of business education in technology. *Business Education Forum*, 48, 11-12.
- Pope, C., & Golub, J. (2000). Preparing tomorrow's English language arts teachers today: Principles and practices for infusing technology. *Contemporary Issues in Technology and Teacher Education*, 1(1), 89-97.
- Ray, B. J. (2001, December). Impact of staff development training on technology integration in secondary school teachers' classrooms. (Doctoral dissertation, University of Oklahoma, 2001).
- Reichstetter, R. A. (1999). Computer technology connections to classroom teaching: Follow-up on implementation after training. (Doctoral dissertation, North Carolina State University, 1999).
- Reinen, I. J., & Plomp, T. (1993). Staff development as a condition for computer integration. *Studies in Educational Evaluation*, 19, 149-166.
- Reinking, D., McKenna, M., Labbo, L., & Kieffer, R. (Eds.). (1998). *Handbook of literacy and technology: Transformation in a post-typographic world*. Mahwah, NJ: Erlbaum.

- Reinking, D. (1997). Me and my hypertext: A multiple digression analysis of technology and literacy (sic). *The Reading Teacher*, 50(8), 626-643.
- Richards, G. (2000, November). Why use computer technology. *English Journal*, 90(2), 38-41.
- Rogers, E. M. (1995). *Diffusion of innovations* (5<sup>th</sup> ed.). NY: The Free Press.
- Rosen, L. D., & Weil, M. M. (1995). Computer anxiety: A cross-cultural comparison of students in ten countries. *Computers in Human Behavior*, 11(1), 45-64.
- Russel, M., Bebell, D., O'Dwyer, L., & O'Connor, K. (2003). Examining teacher technology use: Implications for preservice and inservice teacher preparation. *Journal of Teacher Education*, 54(4), 297-310.
- Sachs, S. G. (1993, February). *The Diffusion of Innovations: The Overlooked Literature*. Paper presented at the meeting of the Association for Educational Communications and Technology, New Orleans, L.A.
- Sandholtz, J. H., Ringstaff, C., & Dwyer, D. C. (1997). *Teaching with technology: Creating student-centered classrooms*. New York: Teachers College Press.
- Schaffer, S. P., & Richardson, J. C. (2004). Supporting technology integration within a teacher education system. *Journal of Educational Computing Research*, 31(4), 423-435.
- Schwandt, T. A. (1994). Constructivist, interpretivist approaches to human inquiry. In N. K. Denzin & Y. S. Lincoln (Eds.) *Handbook of qualitative research* (pp. 118-137). Thousand Oaks, CA: Sage.
- Sheingold, K., & Hadley, M. (1990). *Accomplished teachers: Integrating computers into classroom practice*. New York: Center for Technology in Education, Bank Street College.

- Sherry, L., Billig, S., Tavalin, F., & Gibson, D. (2000, February). New insights on technology adoption in schools. *T H E Journal*, 27(7), p. 43-48.
- Showers, B., Joyce, B., & Rolheiser-Bennett, C. (November 1987). Synthesis of research on staff development: A framework for future study and a state-of-the-art analysis. *Educational Leadership*, 45(3), 77- 87.
- Siegel, J. (May-June 1995). The state of teacher training. *Electronic Learning*. 43-53.
- Snyder, I. (1999a). Using information technology in language and literacy education: An introduction. In J. Hancock (Ed.), *Teaching literacy using information technology*. (pp. 1-10). Australian Literacy Educators' Association.
- Snyder, I. (1999b). Integrating computers into the literacy curriculum: More difficult than we first imaged. In J. Hancock (Ed.), *Teaching literacy using information technology*. (pp. 11-30). Australian Literacy Educators' Association.
- Sparks, D., & Loucks-Horsley, S. (1989). Five models of staff development for teachers. *Journal of Staff Development*, 10 (4), 40-57.
- Spiro, R., & Jehng, J. (1990). Cognitive flexibility theory and hypertext: Theory and technology for the nonlinear and multidimensional traversal of complex subject matter. In D. Nix & R. Spiro (Eds.), *Cognition, education, and multimedia: Exploring ideas in high technology*. Hillsdale, NJ: Erlbaum.
- Staples, A., Pugach, M. C., & Himes, D. (2005). Rethinking the technology integration challenge: Cases from three urban elementary schools. *Journal of Research on Technology in Education*, 37(3), 285-311.
- Stasz, C., & Shavelson, R. J. (1985). Staff development for instructional uses of microcomputers. *AEDS Journal*, 1-19.

- Statewide Education Technology Plan (1997). Atlanta, Georgia Department of Education Office of Technology Services.
- Stecher, B., & Solorzano, R. (1987). *Characteristics of effective computer in-service programs*. Educational Testing Service.
- Stockdill, S. H., & Morehouse, D. L. (1992). Critical factors in the successful adoption of technology: A checklist based on TDC findings. *Educational Technology*, 32(1), 57-58.
- Strauss, A., & Corbin, J. (1998). *Basics of qualitative research* (2<sup>nd</sup> ed.). Thousand Oaks, CA: Sage Publications.
- Surry, D. W., & Farquhar, J. D. (1997). Diffusion theory and instructional technology. *Journal of Instructional Science and Technology*, 2(1) Retrieved September 10, 2004, from <http://www.usq.edu.au/electpub/e-jist/docs/old/vol2no1/article2.htm>.
- Swenson, J., Rozema, R., Young, C. A., McGrail, E., & Whitin, P. (2006). Beliefs about technology and the preparation of English teachers: Beginning the conversation. Retrieved July 17, 2006 from <http://www.citejournal.org/vol5/iss3/languagearts/article1.cfm>
- Teale, W. H., Labbo, L. D., Kinzer, C., & Leu Jr., D. J. (2002). Exploring literacy on the Internet. *Reading Teacher*, 55, 654-660.
- Technology (2002). Technology and professional development. *Technology and Learning*, 25(4), 24-25.
- Thakkar, U., Hogan, M. P., W. J., & Bruce, B. (2001). Extending literacy through participation in new technologies. *Journal of Adolescent & Adult Literacy*, 45, 212-220.

- Thompson, A. D. (2005). Scientifically based research: Establishing a research agenda for the technology in teacher education community. *Journal of Research on Technology in Education, 37*, 331-337.
- Traubitz, N. (1998). A semester of action research: Reinventing my English teaching through technology. *English Journal, 87*(1), 73-78.
- Tyack, D., & Cuban, L. (1995). *Tinkering toward utopia: A century of public school reform*. Cambridge, MA: Harvard University Press.
- U.S. Congress, Office of Technology Assessment (1995). *Teachers and technology: Making the connection*. Washington, DC: United States Government Printing Office.
- U.S. Department of Education. (1996). *Achieving the goals*. Retrieved April 23, 2003 from <http://www.ed.gov/pubs/AchGoal4/index.html>
- Vagle, R., & College, D. (1995). Technology instruction for preservice teachers: An examination of exemplary programs. In D. Willis, B. Robin, & J. W. Willis (Eds.), *Technology and teacher education annual*. (pp. 230-237). Charlottesville, VA: Association for the Advancement of Computing in Education.
- Valmont, W. J., & Wepner, S. B. (2000). Using technology support literacy learning. In S. B. Wepner, W. J. Valmont, & R. Thurlow (Eds.), *Linking literacy and technology: A guide for K-8 classrooms* (pp. 2-18). International Reading Association.
- Voogt, J., Almekinders, M., van den Akker, J., & Moonen, B. (2005). A 'blended' in-service arrangement for classroom technology integration: Impacts on teachers and students. *Computers in Human Behavior, 21*, 523-539.
- Wedman, J. F., & Diggs, L. (2001). Identifying barriers to technology-enhanced learning environment in teacher education. *Computers in Human Behavior, 17*, 421-430.

- Whale, D. (2006). Technology skills as a criterion in teacher evaluation. *Journal of Technology and Teacher Education, 14*(1), 61-74.
- Wilhelm, J. D. (2000). Literacy by design: Why is all this technology so important? *Voices From the Middle, 7*(3), 4-14.
- Yaghi, H. (1996). The role of the computer in the school as perceive by computer using teachers and school administrators. *Journal of Educational Computing Research, 15*, 137-155.
- Yildirim, S. (2000). Effects of an educational computing course on preservice and inservice teachers: A discussion and analysis of attitudes and use. *Journal of Research on Computing in Education, 32*, 479-495.
- Yildirim, S., & Kiraz, E. (1999). Obstacles in integrating online communications tools into preservice teacher education: A case study. *Journal of Computing in Teacher Education, 15*, 23-28.
- Young, C. A., & Bush, J. (2004). Teaching the English language arts with technology: A critical approach and pedagogical framework. *Contemporary Issues in Technology and Teacher Education, 4*(1), 1-22.
- Zhao, Y., Pugh, K., Sheldon, S., & Byers, J. L. (2002). Conditions for classroom technology innovations. *Teachers College Record, 104*, 482-515.

## APPENDIX A

### A Two-Level Approach to an Inservice Program

<b>The Beginners Program</b>	<b>The Advanced Program</b>
<b>Characteristics of the Participants</b>	<b>Characteristics of the Participants</b>
Most of the teachers are motivated by one of three reasons. Their son or daughter is a whiz and they don't want to be intimidated, they don't want to feel left behind by the changing society, or they see other teachers doing great things with computers and they want to join in.	Participants have used computers before and are comfortable with them. The training will focus more on expanding the teachers' use of the computer as a tool for completing professional and personal tasks. Because the participants have already experienced successes and failures in working with the computer they are more likely to take risks. They expect to learn as much from each other as the instructor.
<b>Course Content</b>	<b>Course Content</b>
Participants learn how to turn on a computer, boot a disk, load, a program, save, and print. There is knowledge about hardware and word processing is a priority.	A model of instructional design is presented and teachers apply the components presented and create their own instructional lesson. Teachers learn about issues of incorporating the computer in the classroom and how to schedule and maintain a lab. The course offers strategies for planning and delivering inservice training to other teachers. Finally the course focuses on procedures for software evaluation.
<b>Teaching Strategies</b>	<b>Teaching Strategies</b>
Content is highly structured and there is a lot of support from the trainer. Teachers work together in groups of two or three. Each teacher has a computer to work on. There is supervised exploration time.	Peer teaching is used to give teachers the experience of training other teachers. The participants also create a project of their choice. The course requires participants to read articles regarding computer-based instruction.

(Carrier, Glenn, & Sales, 1985; Carrier & Glenn, 1991)

## APPENDIX B

### Seven Stances Toward Technology

Neutrality (sees no advantages or disadvantages to integration)	No stance is needed because literacy is about feelings and technology is about things. Texts and objects are separate entities. This stance accepts that technology is valuable, but does not connect technology with texts.
Opposition (integration causes problems)	This position stands in opposition of technology. The uses of technology for surveillance and regimentation outweigh any alleged benefits. There is a fear that a technicizing society will destroy humanity.
Utilitarian (technology is a useful tool)	This position argues that technology has marvelous new tools for teaching and learning and can improve literacy education.
Skeptical (technology may be useful but its usefulness is unproven)	This position represents a pessimistic side of utilitarianism. They do not see dangers in technology, however, they have not seen the marvels either.
Transformational (integration transforms the very nature of literacy)	This position believes that technology will radically transform the basic definition of literacy. They see this as a positive result.
Aesthetic (technology provides opportunities for creativity)	This position believes that technology holds rich opportunities for creativity.
Transactional (there is a transaction between literacy and technology)	Technologies participate intimately in the construction of all literacy practices. They are not separate from texts and meaning making, but rather are part of how we enact texts and make meaning. We make texts materials through technologies of papyrus, paper, chalkboard, or electronic screen.

(Baker, 2003; Bruce, 1999)

## APPENDIX C

### High School Language Arts Teachers' Experiences with Integrating Technology after participating in TAFT: A State Mandated Technology Professional Development Course

#### Consent Form

Thank you for volunteering to participate in a qualitative study of integrating computers into the language arts curriculum. The purpose of this study is to develop rich description of the many and varied ways high school language arts teacher integrate technology into the existing curriculum. It also provides documentation on how a state mandated technology staff development course helps teachers achieve this goal. You may withdraw from the study at any time.

There are no risks to you associated with participating with this study. You will not receive any personal benefits aside from the fact that you might share new and exciting lessons with other teachers. The benefits from this study may provide pertinent information to the county office providing training regarding follow through of training in classroom practice.

The findings from the study will be reported anonymously. You will not be identified personally. A pseudonym will be used instead of your legal name. All documentation will be kept in a locked file cabinet and I will be the only one with access to the file cabinet.

I will conduct three formal interviews and several informal interviews throughout the semester. I will observe your three lesson plans that integrate technology into the language arts curriculum. You may ask to see any notes, observations, or interviews at any time.

Please feel free to call me at home (770) 271-3963 or email me [stacy\\_byous@gwinnett.k12.ga.us](mailto:stacy_byous@gwinnett.k12.ga.us) at any time if you have any questions. You may also contact my advisor, Dr. Joyce E. Many at Georgia State (404) 651-2516 if you have any questions about the design of the study.

If you have questions about your rights as a participant in this research study, you may contact Susan Vogtner of the Institutional Review Board (IRB), which oversees the protection of human research participants. The office of research compliance can be reached at (404) 651-4350.

I will give you a copy of this consent form to keep for your records.

Print Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

\_\_\_\_\_  
Dr. Joyce Many, Principal Investigator

\_\_\_\_\_  
Stacy Byous, Student Investigator

APPENDIX D  
Interview Questionnaire Survey

There are four parts to this survey.

**Part 1**

Name \_\_\_\_\_

Years of teaching experience \_\_\_\_\_

Subject matter that you currently teach \_\_\_\_\_

List any computer classes you have taken previously along with the number of hours, and the name of the instructor – if you are unsure, it's ok.

Name of course	Number of Hours	Name of instructor
----------------	-----------------	--------------------

1.

2.

3.

4.

5.

What computer programs do you currently use? What do you use them for?

Why did you enroll in TAFT?

Would you have taken this class if it weren't required? Why or why not?

What did you hope to get out of the class? Did you get out of it what you wanted to? Why or why not?

**Part 2**

Rate your competency level in using the following categories of software applications.  
Circle the number that corresponds with your answer.

1=Not familiar

2=Familiar but not competent

3=Competent

4=Proficient

1. Word Processing (e.g., Word)	1	2	3	4
2. Database Management (e.g., Access, FileMaker)	1	2	3	4
3. Spreadsheet (e.g., Excel)	1	2	3	4
4. Presentation Software (e.g., PowerPoint) can use sound and video	1	2	3	4
5. Telecommunications (e.g., e-mail) can use lotus notes efficiently with attachments and creating folders for storing saved emails	1	2	3	4
6. Web browsing (e.g., Netscape Navigator, Internet Explorer) can use search engines and navigate the forward and back buttons	1	2	3	4
7. Educational software (e.g., drill simulation)	1	2	3	4
8. Desktop Publishing (e.g., PageMaker)	1	2	3	4
9. Assessment (e.g., AKS test bank)	1	2	3	4
10. SASI (e.g., attendance, IGPro)	1	2	3	4
11. File Management can save documents to different locations (A:, C:, H: drives and can create varying levels of folders	1	2	3	4
12. Networking can create, use, and save to the school's shared drive	1	2	3	4
13. Graphics can use clipart, import, and edit	1	2	3	4
14. Web Development can create simple web pages	1	2	3	4
15. Curriculum Support can use lotus notes to access lesson plans created by the county	1	2	3	4

(Yildirim, 2000)

modified by Byous (2003)

**Part 3**

Please indicate any problems you have in using/integrating computers into your curriculum.

	Strongly Agree	Agree	Un-Certain	Disagree	Strongly Disagree
1. Insufficient number of computers available					
2. Insufficient number of printers available					
3. Difficulty in keeping computers and printers in working order					
4. Computers are either out-of-date, incompatible with current software, too slow, not sufficient memory, etc					
5. Not enough software for instructional purposes					
6. Software is too difficult or too complicated to use					
7. Manuals and support materials poorly designed, incomplete, inappropriate, or not existent					
8. Not enough help for supervising computer use students/teachers					
9. Difficult to integrate computers in classroom instruction					
10. Teachers lack knowledge/skills about using computers for instructional purposes					
11. Insufficient expertise/guidelines for helping teachers use computers instructionally					
12. No room in the school timetable for students to learn about or to use computers					

13. Not enough technical assistance for operating and maintaining computers					
14. Problems with scheduling enough computer time					
15. Insufficient training opportunities for teacher					
16. Lack of administrative support or initiatives from a higher level school administration					
17. Inadequate financial support					
18. Computers do not fit in the educational policy of the school					
19. Not enough time to develop lessons in which computer are used					
20. Lack of interest/willingness of teachers in using computers					

(Pelgrum & Plomp, 1993)  
(modified by Byous, 2003)

Are there any other problems you have encountered that are not listed?

**Part 4**

Please select the stance that most describes your stance towards technology and literacy.

### **Seven Stances Toward Technology**

Neutrality (sees no advantages or disadvantages to integration)	No stance is needed because literacy is about feelings and technology is about things. Texts and objects are separate entities. This stance accepts that technology is valuable, but does not connect technology with texts.
Opposition (integration causes problems)	This position stands in opposition of technology. The uses of technology for surveillance and regimentation outweigh any alleged benefits. There is a fear that a technicizing society will destroy humanity.
Utilitarian (technology is a useful tool)	This position argues that technology has marvelous new tools for teaching and learning and can improve literacy education.
Skeptical (technology may be useful but its usefulness is unproven)	This position represents a pessimistic side of utilitarianism. They do not see dangers in technology, however, they have not seen the marvels either.
Transformational (integration transforms the very nature of literacy)	This position believes that technology will radically transform the basic definition of literacy. They see this as a positive result.
Aesthetic (technology provides opportunities for creativity)	This position believes that technology holds rich opportunities for creativity.
Transactional (there is a transaction between literacy and technology)	Technologies participate intimately in the construction of all literacy practices. They are not separate from texts and meaning making, but rather are part of how we enact texts and make meaning. We make texts materials through technologies of papyrus, paper, chalkboard, or electronic screen.

## Appendix E

### Interview Questions

Do you assign technology homework for students that is done outside the classroom?

What projects do you have your students complete that might involve technology?

Is there something you would like to do with technology, but can't?

What types of technology do use for personal use?

What types of technology do use for professional use?

What is perception of what technology integration looks like?

Do you give students instructions for using technology? Downloading clipart?

What are your feelings about the TAFT class?

Are there any problems that you have with integrating technology?

What types of technology are you currently using in your classroom?

Where do students learn technology?

Do your technology lesson meet your expectations?

There are CDs that go along with your new textbooks. Do you use them as a resource? Do your students use them?

## Appendix F

### Sample of Categories and Themes

<b>Technology Use</b>			
	<b>Amber</b>	<b>Ashley</b>	<b>Gavin</b>
<b>Personal Use</b>	Cellphone, camcorder, CD Burner, copier, online banking, email, Internet, lesson ideas, ordered a book	Word, Netscape, computer at home is basic, email, online banking, mapquest, tickets, health information, cellphone, camcorder, scanner	Word, hotmail, chess, digital camera, Yahoo, scanner, thumb drive, TIVO, cellphone
<b>Professional Use</b>	PowerPoint, SASI, IGPro, Lotus Notes, Word Publisher, Internet	Word, Excel, PowerPoint, Netscape, SASI, IGPro, Lotus Notes,	SASI, IGPro, Lotus Notes, Internet, Hypersnap
<b>Student Use</b>	Word, Publisher, Internet, PowerPoint	Word, Publisher, Internet, PowerPoint	Internet

<b>Obstacles</b>			
	<b>Amber</b>	<b>Ashley</b>	<b>Gavin</b>
<b>Time Impacted Technology Integration</b>	1,000 pages in American Literature book, no time to learn how to use scanner	No time with new textbooks, no time to view PowerPoint presentation,	Accomplish more in the 1980's, have to give up instructional time, no time to view PowerPoint presentation,
<b>Available Technology Sat Idle</b>	Scanner was not used b/c lack of training, student computer not used, spreadsheet and web page software not used	Scanner was not used b/c lack of training, difficulty getting into lab, student computer not used, LCD projector not used, did not know laptop is a CD burner, spreadsheet and webpage software not used	Difficulty getting into lab, needs training for website, missing mouse on student computer, spreadsheet and web page software not used

## Appendix G

### Data Reduction

	<b>Amber</b>	<b>Ashley</b>	<b>Gavin</b>
<b>personal use</b>	Cell phone, camcorder, cd burner, copier, online banking, email, internet, lesson ideas, ordered a book	Word, Netscape, computer at home is basic, email, on line banking, map quest, tickets, health info, cell phone, camcorder, scanner	Word, hotmail, chess, digital camera, Yahoo, scanner, thumb drives so no CD burner, Tivo, cell phone
<b>professional use</b>	PP, Sasi, IGPro, Lotus Notes, Word, Publisher, limited internet before the class	PP, Sasi, IGPro, Lotus Notes, Word, Excel, Netscape. Only PP before the class and that was created by another teacher	Sasi, IGPro, Lotus Notes, Internet, Hypersnap
<b>advanced degree</b>	Designed two PP for Gifted certification. Amy choose PP – it was not required  Instructor took teachers to lab to use website for teacher sources and rubrics	3 classes 1. respond to reflections online 2. instructed to present using PP 3. instructor didn't use it or require others to use it	
<b>professional learning</b>	Instructor used PP for book adoption. Let teachers use lab to explore programs used on CD.	Same	same
<b>technology used teacher use</b>	PP, Publisher, Word, Internet	PP, Publisher, Word, Internet	Internet
<b>directions given to students</b>	Gives instructions verbally. Explains where to find the template. Amy had an example of a table. Instructions in group folder.	Explains verbally how to insert clip art because most of them already know it. Ashley helps those who don't individually. Provides handout with step by step instructions for assignment. Students don't see her using the technology. She doesn't want to look foolish. There is no use of the LCD Projector. Let's students select which software to use.	Does not show them how to do any of the research. He just lets them go.

<b>for assignments that involve technology is time set aside</b>	Some time is set aside for projects. Students are expected to work on their own. Labs are made available after school for students without computers. They start project in class and some will finish in class. Those who don't need to finish on their own.	same	Assigns year long research project. Gives time to go to media center where there are books. Students choose books on computer to research. No time set aside for typing paper.
<b>student expertise</b>	Feels students are already proficient in using computer	Says, "They show me how to do things."	Says, "I think their creations are neat."
<b>where do kids learn</b>	Basic computer exposure, computer classes, other teachers require it	At home	Other educations, "peers-like sex."
<b>obstacles</b>	Availability of labs (tech talk), insufficient number of computers – the more teachers are trained the more they want to use, 3 day window, to much to cover in American Lit – 1,000 page book.  Manuals & support materials – nothing from the publisher – My responsibility to figure it out. Doesn't know how to use scanner in lab.	Lack of comfort with teaching technology, trouble getting access (tech talk), doesn't know how to set up LCD, comfortable with software but not hardware, time, technology assistance, # of computers, not enough help supervising, difficult to integrate, teachers lack of know how, 3 day window, to much to cover in all classes, no manuals for scanner	Technician should be available when needed (tech talk), labs not available, inconvenient, time consuming transporting kids, # of computers, not enough supervising, difficult to integrate, teachers lack of knowledge, 3 day window, to much to cover in all classes, see interview.
<b>something you want to do but can't</b>	Nothing	Nothing	Nothing, not my lack of competence – it's the obstacles
<b>are you using what you learned</b>	I did the 1 <sup>st</sup> year, now I modify because I like to keep it interesting – some variations	No new curriculum, I use the 1 <sup>st</sup> one for ESOL	I don't use those. Says, "It was a dog and pony show." Learned Hypersnap and still uses it.

<b>feelings about TAFT</b>	Interest was peaked in TAFT. Wasn't using programs before TAFT but after exposure in TAFT she put them to use. Said, "Anything I've done with technology I got from the class."	Didn't want to take. Said, "I could have tested out but figured I would learn something."	Said, "I did not want to take it. I learned where to find pictures of literary figures. I don't think I gained essential information. I learned how to decorate the car. I don't like to decorate. It was a worthwhile experience but resents powers that be."
<b>would you sign up for TAFT</b>	Limited amount of time, grading essays.	2 <sup>nd</sup> year of teaching, already overwhelmed.	Adept at the level that I need to be.
<b>3 TAFT lessons</b>	1. Publisher calendar (students) 2. PP (teacher) 3. report / research (students)	All performed by students: 1. Research paper on controversial topic 2. Publisher advertisement 3. Publisher college brochure	1. PP for review of Brit Lit (teacher) 2. Gwinnett Media Research Services to create B.B. (students) 3. Publisher brochure on a book (students)
<b>web page</b>	Said, "Web page about me was required. I won't go back to it. I would rather spend the time thinking how kids can use technology instead of going to my website."	No time to keep up with it.	
<b>artifacts from TAFT</b>	They are a resource. She creates new ones and modifies	Uses the Shakespeare research paper but the others are a resource	
<b>could you have a project w/out technology</b>	No, elaborated in interview 2 and in observational notes	Students earned A and B	
<b>tech award</b>			Google research for plagiarism. Won media award. Learned the search in TAFT and still use.

## APPENDIX H

### **Chinese and Japanese Poetry Project**

**Throughout this unit, you will be reading and analyzing various kinds of poetry and philosophical sayings from Chinese and Japanese culture. As a way to show what you have learned as well as express your own feelings or beliefs, you are going to make two visual representations of Chinese and Japanese literature.**



**Here is the assignment:**

- 1. A visual representation of one of the pieces looked at during this unit (analects, poetry, haiku, etc.) (50 pts)**
  - a. The piece of writing itself must be typed neatly and creatively on an 8 ½ x11 sheet of paper. (15)**
  - b. There should be a picture (hand drawn or computer generated) that represents and visually illustrates that piece of writing. (25)**
  - c. The sign should be colorful, neat, and attractive. (10)**
- 2. A visual representation of a piece of writing that you have composed in the style of Chinese or Japanese writers (50 pts)**
  - a. The piece of writing itself must be typed neatly and creatively on an 8 ½ x 11 sheet of paper. (25)**
  - b. There should be a picture (hand drawn or computer generated) that represents and visually illustrates that piece of writing. (15)**
  - c. The sign should be colorful, neat, and attractive. (10)**

**You will be graded on the following:**

- Creativity (Did I think about my project and come up with interesting, original ways to illustrate it?)**
- Thoughtfulness (Have I thought about Chinese and Japanese literature and what it means to me? Is the picture appropriate and representative of the writing?)**
- Product itself (Is it neat? Is it colorful? Was there obvious effort involved?)**

**We will be working on these in the computer lab for two days. All writing must be finished before you will be allowed to go to the computer lab. You will not be able to print in the lab, however, because it is black and white. This assignment must use color.**

## APPENDIX I

### **PARODY PROJECT FOR DANTE'S *INFERNO***

1. Each Inferno must be named. For example, mine is called "UGA Inferno."
2. Each circle must have a "sin" or reason for being there. For example, the "sin" for my Circle 2 is the sin of being a former UGA football player who went on to play pro ball.
3. Each circle must have a punishment. The punishment for Circle 2 is that the former UGA football players are now eternal bench warmers and water boys for the pro team for which they play.
4. At least 2 of the circles must have a "souls present." Some of the souls present in my circle 2 are Goldberg and Andre Hastings. (However, do not give specifics for any teachers or administrators here at the school—don't be offensive!!!!!!)
5. You must create a "Satan" for your circle 9. My Satan has the heads of the last three UGA football coaches on the body of Uga VI.

**Each project will be presented to the class beginning Tuesday, March 21, 2006. ALL PROJECTS ARE DUE ON THIS DATE!!!!!! You will have to submit it to me by then.**

**This counts as a project/essay grade.**

You will be doing your project as a powerpoint presentation. We will be working in class for 2 days with the computers. Any other work must be done on your own time. You will be graded on presentation, grammar, and for the above list of requirements. You must sign up with me to get your project idea approved. You may work with one other partner.

APPENDIX J

**Persuasive Research Paper**

You are going to write a persuasive research paper on an assigned controversial topic. You will use correct MLA format with note cards, bibliography cards, citations, etc. There will be some class time given for research, but much of this paper must be done on your own. I will be grading the content of your research as well as the conventions used in your writing. The actual process is very important for this assignment.

We will work in class on bibliography format, outlines, parenthetical citations, etc. There will be daily grades given along the way as well as the overall essay grade.

**YOU WILL WANT TO DO YOUR BEST!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!**

Length: Standard 5-paragraph format; body paragraphs will include a clear reason for the position taken on the topic and specific support for the reason as well as 3 concrete details and 2 pieces of commentary plus intro and concluding sentences; introduction and conclusion paragraphs must be at least 5 sentences. You must also have a Works Cited page.

Requirements:

- Thesis Sentence and Research Questions: BEFORE going to the library or computer lab for research, you need to have a working outline—a list of points that you plan to research. It should include your topic, which side of the argument you are taking, and at least 2 areas of the topic to research.

DUE: \_\_\_\_\_

(Type of Grade: Daily grade out of 20)

- Bibliography/Source Cards: For each of the sources that you MAY use in your paper, you need to record the author, title, and publication information on a 3x5 index card. You must have at least 8 DIFFERENT source cards.

DUE: \_\_\_\_\_

(Type of Grade: Daily grade out of 50)

- **Note Cards:** As you take notes from your sources, you will record the information on 4x6 index cards. Be sure to follow the format that we discuss in class. You must have at least 15-20 DIFFERENT note cards.

DUE: \_\_\_\_\_  
(Type of Grade: Daily grade out of 50)

- **Formal Outline:** Following the format that we discuss in class, you will create a formal outline before writing your rough draft. It should include AT LEAST 3 very specific subpoints under each main point. You will need to include your thesis on the outline as well.

DUE: \_\_\_\_\_  
(Type of Grade: Daily grade out of 50)

- **Rough Draft:** Handwritten or typed, the rough draft should include at least 5 paragraphs, at least 10 parenthetical citations, and at least 5 different sources. You also need to include your outline and a Works Cited page.

DUE: \_\_\_\_\_  
(Type of Grade: Daily grade out of 100)

- **Final Paper:** The final paper must be typed, DOUBLE-SPACED, 12 pt. Arial or Times New Roman font. It should include at least 5 paragraphs, at least 10 parenthetical citations, and at least 5 different sources. You will have a title page, a finished outline, and a Works Cited page. You will turn in everything together (essay, note cards, source cards, all outlines, etc.) in a 3-prong folder WITH pockets. The research paper should be placed in the folder's prongs, the outlines and source cards should be placed in the front pocket, and the note cards should be placed in the back pocket with rubberbands around them.

DUE: \_\_\_\_\_  
(Type of Grade: Essay grade out of 100)

### **IMPORTANT REMINDERS:**

1. Due dates for all components but the final draft will be extended ONLY for an excused absence in which case the required component will be due ONE day after the original due date. Basically, the work is done in class, so I'll let you work on your own to catch up on the day you return. Only the next due date will be extended, though, not *all* of them. We have to

maintain a strict schedule, and we don't have time to wait 5 days for you to catch up with us. So...if you miss school, make LA your **FIRST** priority for makeup work and get the other stuff done within your 5 days!

2. The final draft is due on the date assigned **REGARDLESS** of absences from now until then. If you have an *excused* absence on the due day, then your final draft is due at the beginning of the class period the following day. To make yourself look like *less* of a slacker: if you're out that day, have somebody bring me the paper that day at school!
3. No credit will be given for late project components. And, each project component must be submitted before the next component will be accepted. (For example, if you fail to submit note cards on the due date, then you will receive O's for them. And, you *still* must submit them before I'll accept your outline). For the final draft, remember that my policy is 10 points per day deduction if it's late (but it may only be ONE day late).

**\*\*Any information on this sheet is subject to change at my discretion. ☺**