

**AN EXPLORATORY STUDY OF THE LEVELS OF TECHNOLOGY
IMPLEMENTATION IN THE TEACHING OF WRITING TO STUDENTS IN
DIVERSE, LOW-INCOME HIGH SCHOOLS IN TEXAS**

A Dissertation

by

COURTNEY FAITH HAGGARD WELLMANN

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of
DOCTOR OF PHILOSOPHY

August 2012

Major Subject: Educational Administration

An Exploratory Study of the Levels of Technology Implementation in the Teaching of
Writing to Students in Diverse, Low-Income High Schools in Texas

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Approved by:

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ABSTRACT

An Exploratory Study of the Levels of Technology Implementation in the Teaching of
Writing to Students in Diverse, Low-income High Schools in Texas.

(August 2012)

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M.Ed., Texas A&M University

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As access to technology increases, educators must continue to study how to best integrate these resources to help close the writing achievement gap and prepare students for college and careers. This survey explores the levels of technology use in English classrooms at diverse, low-income high schools in Texas where 70 percent or more students are identified as economically disadvantaged. This study examines how teachers' levels of implementation relate to teachers' age, years of teaching experience, highest degree earned, and the type of school. Teachers completed an online survey indicating their curriculum and instructional practices, their personal computer use, and their implementation of writing in the classroom. Based on these results, follow-up interviews were conducted with teachers who volunteered to be interviewed.

Quantitative statistical analysis of the research evidence using chi square tests indicates a relationship between teachers' level of technology implementation and their age and years of experience teaching. However, the type of school where teachers teach

(suburban, urban, or rural) and the highest degree earned by the teacher does not relate to teachers' implementation level, according to the statistical analysis. Thus, this dissertation is about high school English teachers' perspectives on levels of technology implementation in schools serving diverse learners.

Using qualitative analysis, the study also found that technology is used on a limited basis by the teachers who provided comments in the survey and those who were interviewed due to lack of access to computers in classrooms. Most teachers indicated they use the teacher computer in their classrooms for clerical tasks and/or presentations to students. Student use of computers was limited to scheduling time in labs that must be shared among the other teachers and students on campus. In addition, the teachers commented that additional professional development is needed to help them implement available technology resources for teaching and learning.

To address these challenges, administrators need to study what technology resources best support the teaching of writing, particularly in ways that help close the achievement gap and prepare students for college and careers. Administrators should provide for teachers and students more accessibility to technology resources beyond the school-wide computer lab. Finally, administrators need to offer their teachers varied, ongoing, and collaborative professional development focused on both writing instruction and technology resources to improve teachers' proficiencies and confidence in these areas.

DEDICATION

To my husband, Rodney, for your endless support and encouragement to me to finish my degree; you have coached me to the finish line.

To my parents, who instilled in me at an early age a love of learning and a desire to succeed. You have been an example to me, and your constant love and value of education have inspired me to always reach for the stars.

To my children, who motivate me to be better at everything I do. I love you to the moon and back, and I hope my achievement will encourage you to set lofty goals and then to work diligently to meet them.

To my friends and students, who have pushed me, prayed for me, and inspired me to accomplish what at times seemed like the impossible.

ACKNOWLEDGEMENTS

“Therefore, since we are surrounded by such a great cloud of witnesses, let us throw off everything that hinders and the sin that so easily entangles. And let us run with perseverance the race marked out for us” (Hebrews 12:1-2). Completing my degree has been a marathon filled with obstacles, but my faith in God has taught me to persevere with the help of my family and friends of witnesses who have cheered me and guided me to victory. I am blessed beyond measure for the support and love.

I would like to thank my committee chair, Dr. Skrla, and my committee members, Dr. McKenzie, Dr. Scheurich, and Dr. Smith, who gave me direction and encouragement to finish this research. I am indebted to them for their expertise.

Thanks also go to my friends and colleagues in College Station Independent School District. Several teachers in the English department tested my survey set up, proofed drafts, typed interviews, and asked about my progress with interest and support. Special thanks go to my best friend and district technology specialist Randi Costenbader for technical assistance, time spent reviewing my documents, and her constant encouragement. I am also grateful to Stoney Pryor and Scott Carpenter for their assistance with my statistical analysis. I also want to extend my gratitude to the high school English teachers who were willing to participate in the study.

Finally, thanks to my husband Rodney for his support and motivating words, to my parents Bill and Kathy Haggard for their encouragement, and to my children Harrison and Chelsea for their patience and love.

TABLE OF CONTENTS

	Page
ABSTRACT	iii
DEDICATION	v
ACKNOWLEDGEMENTS	vi
TABLE OF CONTENTS	vii
LIST OF TABLES	x
LIST OF FIGURES.....	xi
 CHAPTER	
I INTRODUCTION.....	1
Statement of the Problem	8
Purpose of the Study	9
Research Questions	10
Operational Definitions	10
Assumptions and Limitations.....	11
Significance Statement.....	12
Chapter Conclusion	13
II REVIEW OF THE LITERATURE.....	14
Introduction	14
Composition Theories	14
Integration of Computers in Writing Instruction.....	18
The Effect of Standardized Tests on Writing and Writing.....	25
Instruction.....	25
Technology Standards for Teachers and Students	28
Impact of Low-Income Status on Students' Learning	35
Disparities in Digital Access	39
Preparing Students for College and Careers	40
The Administrator's Role in Preparing Teachers to Incorporate ...	45
Technology	45
Chapter Conclusion	49

CHAPTER	Page
III	METHODOLOGY 51
	Introduction 51
	Research Design 51
	Research Population 55
	Procedures 56
	Chapter Conclusion 63
IV	RESULTS AND DATA ANALYSIS 65
	Introduction 65
	Raw Data Overview 66
	Quantitative Analysis 70
	Qualitative Analysis 85
	Theme 1: Access to Technology Resources 85
	Theme 2: Technology Proficiencies and Professional Development 89
	Theme 3: Philosophies on Writing Instruction and Pedagogical Beliefs about Technology 90
	Chapter Conclusion 94
V	SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS 96
	Introduction 96
	Summary 96
	Discussion of Major Findings 108
	Implications for Further Study 115
	Recommendations 116
	Conclusions 119
	REFERENCES 121
	APPENDIX A 135
	APPENDIX B 136
	APPENDIX C 146
	APPENDIX D 147
	APPENDIX E 148

	Page
APPENDIX F	152
APPENDIX G	157
VITA	159

LIST OF TABLES

TABLE		Page
1	Levels of Technology Implementation (LoTI) Profiles.....	52
2	School Profiles of Survey Respondents.....	57
3	Age Range Profile of Survey Respondents.....	68
4	Number of Years Teaching Experience of Respondents.....	68
5	Highest Degree Earned by Survey Respondents.....	68
6	Type of School of Respondents.....	69
7	LoTI Profiles of Survey Respondents.....	70
8	Combined LoTI Profiles of Survey Respondents.....	71
9	Chi Square Test for LoTI Combined Profile and Years of Teaching Experience.....	72
10	Chi Square Test for LoTI Combined Profile and Teachers' Ages.....	73
11	Chi Square Test for LoTI Combined Profile and Highest Degree Earned.....	75
12	Chi Square Test for LoTI Combined Profile and Combined Degree Earned.....	77
13	Chi Square Test for LoTI Combined Profile and Combined Degree Earned from Bachelor's Degree to Master's Degree.....	78
14	Chi Square Test for LoTI Combined Profile and Type of School...	80
15	ANOVA.....	82

LIST OF FIGURES

FIGURE		Page
1	Percentage of years of teaching experience and LoTI combined profile	72
2	Percentage for teacher age and LoTI combined profile	74
3	Percentage for highest degree earned and LoTI combined profile...	76
4	Percentage for combined degree earned and LoTI combined profile	77
5	Percentage for combined degree earned from bachelor's degree to master's degree and LoTI combined profile	79
6	Percentage for type of school and LoTI combined profile	80

CHAPTER I

INTRODUCTION

As a public high school English and journalism teacher in Texas for 20 years, I understand how important good communication skills are to student success in high school and beyond. I explain to my students that good writing skills are crucial regardless of their college major and will likely be necessary in any career. In addition, I have seen how technology in the last 10 years can enhance students' abilities to effectively communicate. My own district purchased a teacher computer for every classroom in 1997, and then a few labs were opened after that. I often scheduled my English and journalism classes in a lab so that students could type their papers, and I was amazed how quickly students got to work on their assignments in a computer lab as compared to writing with a pen and paper in the classroom. Word-processed student papers included fewer problems with content and mechanics as compared to handwritten papers. In these last 15 years, however, the number of computers for class or student use in my school has not increased greatly, and ongoing professional development on how I can best utilize existing technology for instruction has been limited. All of this spurred my interest in a study on technology implementation in writing classrooms.

In addition, I know that the public schools in Texas and across the nation face growing challenges of equity. Closing the performance gap between racial and ethnic groups is not only a state and federal mandate, but also a moral responsibility to the

This dissertation follows the style of *Journal of Research on Technology in Education*.

diverse students in our country. All of these students will eventually compromise the workforce, so preparing students for college and careers after high school is an additional challenge of each school and an economic obligation to insure the financial and democratic health of our nation. Administrators are charged with leading the instruction and accountability of their schools, so that regardless of a student's background, success in high school and after graduation will be possible. This success includes the ability to communicate both verbally and in writing.

First, schools must understand anticipated employment changes so that they are adapting curriculum to meet the needs of their students. The Employment Projections: 2010 to 2020 News Release from the U.S. Department of Labor's Bureau of Labor Statistics indicates that occupations that typically require post-secondary education will grow the fastest in this decade, and of the 30 jobs that the Bureau predicts will grow the fastest, 17 of those require post-secondary education (Bureau of Labor Statistics, 2012). Employment for occupations in which a master's degree is required for entry is expected to grow by 21.7 percent, more than in any other educational category (Bureau of Labor Statistics, 2012). Moreover, the percentage of those 16 to 24 years of age in the labor force will decrease 12.4 percent from numbers in 1990 to 2000 because of the increased labor growth of those ages 55 and older (Bureau of Labor Statistics, 2012). This increased competition for employment for the younger age group emphasizes the importance of career readiness and the completion of necessary education requirements.

In response to these employment estimations, the 79th Legislature in the state of Texas mandated that the Texas Higher Education Coordinating Board (THECB), along

with the Texas Education Agency (TEA), develop College and Career Readiness Standards (CCRS) in the academic core areas to better align the curriculum between public high schools and college and the workforce (Texas Higher Education Coordinating Board, 2009). These standards are also part of the THECB's efforts to increase both college and university enrollment and graduation rates among different racial and ethnic groups so that there is no significant difference in their success (Texas Higher Education Coordinating Board, 2009). These standards are woven into the revised Texas Essential Knowledge and Skills (TEKS) and are the basis for the current 12 STAARR (State of Texas Assessments of Academic Readiness) End-of-Course (EOC) exams in high school (TEA, 2011, End-of-course assessments). These revised TEKS and the EOC exams are more rigorous than the former TEKS and the current TAKS tests, and the EOC exam score will eventually be 15 percent of a student's course grade, also impacting each student's graduation requirements. Moreover, a college readiness and preparedness component is specifically part of the EOC for English III, which will also be used by Texas public universities and colleges to determine readiness for entry-level college courses (Texas Higher Education Coordinating Board, 2009).

In addition to the bearing on individual students, these exams will also affect schools and school districts as part of their state and federal accountability ratings. In 1984 the Texas Legislature decided to link school accountability to student achievement, and in 1990-91, the Academic Excellence Indicator System was used for the first time to do just that (TEA, 2009, Overview of the Academic Excellence Indicator System). While the system has been tweaked over the years by the Legislature, the State Board of

Education, and the Texas Education Agency, the current report includes a range of information from enrollment in advanced courses and dropout rates to attendance rates and the number of students identified as at-risk, as well as results on statewide assessments (TEA, 2009, Overview of the Academic Excellence Indicator System). Performance on each indicator is disaggregated by the following measures: sex, ethnicity, low income status, special education status, limited English proficiencies, and at-risk status (TEA, 2009, Overview of the Academic Excellence Indicator System). Since 1994, TEA has used these performance measures on AEIS to assign a rating to each school and school district each year, which include exemplary, recognized, academically acceptable, academically unacceptable, and not rated (TEA, 2009, Overview of the Academic Excellence Indicator System). The pressure for stellar performance on these exams often leads to a focus on professional development for teachers, course curricular plans, and teachers' daily classroom instruction, all of which should be effectively led and guided by district and campus administrators.

Furthermore, each school and school district will be evaluated on their students' statewide assessments scores for Adequate Yearly Progress (AYP) as required under the No Child Left Behind federal accountability system (TEA, 2007, Division of Performance Reporting). This federal law, enacted in 2001, requires that schools measure the success of all students to close existing achievement gaps ensuring that "no child is left behind" his or her peers (Wrights Law, 2009, No Child Left Behind: Tool Kit for Teachers). Schools are required to measure this success using state-mandated assessments; these results are then disaggregated according to race, poverty level,

disabilities, and limited English proficiencies (Wrights Law, 2009, No Child Left Behind: A Desktop Reference). Each year, schools are evaluated using a “report card” of these results to indicate not only how well students are meeting standards on state assessments, but also the progress these various students groups are making each year to close achievement gaps (Wrights Law, 2009, No Child Left Behind: A Desktop Reference). Schools that fail to show Adequate Yearly Progress (AYP) for two consecutive years are then noted as needing improvement, which will then require the school to submit detailed improvement plans to address the deficiencies by incorporating scientifically-based teaching strategies in the curriculum, providing effective professional development for teachers, promoting parental involvement, incorporating a teacher mentoring program, and developing benchmark assessments to regularly measure student performance (Wrights Law, 2009, No Child Left Behind: Tool Kit for Teachers). The EOC exams will be phased into the campus and district report and will have similar reporting standards as the current AEIS reports that include the TAKS data (TEA, 2011, STAAR Scoring and Reporting).

The results of the TAKS and EOC tests not only have high stakes for every student in Texas, but also for every teacher, every school, every district in the state. The EOC English III exam for 11th grade students, which includes the college readiness and preparedness component, requires students to complete three written compositions, a persuasive and analytical essay plus a field test response from either category in a time limit of four hours, an incredible shift from one composition on the untimed TAKS test (TEA, 2010, STAAR English III Test Design). These essays will be scored holistically

on a scale of 1 to 4 with a focus on organization and progression, development of ideas, and use of language and conventions, and each essay will be worth 26 percent of the writing score, which is expected to be 15 percent of the student's final grade in the English III course (TEA, 2010, STAAR English III Test Design; TEA, 2012, STAAR English I, II, III Reading and Writing TCTELA Presentation). The persuasive essay requires students to take a position on an issue and present a consistent and sustained argument that supports it in 26 lines or less. The analytical response, also 26 lines or less, requires students to analyze a literary or informational text of 350 to 450 words, and scoring will be based on the student's ability to interpret the text and support it with relevant textual evidence, as well as the quality of the student's writing (TEA, 2012, STAAR English I, II, III Reading and Writing TCTELA Presentation). TEA has reported that scoring of field test essays have shown that students in the higher score range on the essays include the following: strong match between structure or form and purpose, explicit thesis and sustained focus, "narrow and deep" development of ideas with no wasted words or space, short but effective introduction and conclusion, specific use of language and appropriate tone for purpose, and strong conventions (TEA, 2012, STAAR English I, II, III Reading and Writing TCTELA Presentation). Finally, in contrast to the perfect agreement model for TAKS scoring that required agreement of scores between a minimum of two readers, the STAAR EOC exams in English will employ adjacent scoring so that a score is determined by both readers whether in agreement or not (TEA, 2012, STAAR English I, II, III Reading and Writing TCTELA Presentation).

Additionally, technology is increasing at a rapid rate and will only continue to grow. Access to information is faster and easier now than ever, and the ability to communicate with people from around the world is possible through computers, video cameras, and hand-held smart phones. Integrating this available technology into learning opportunities and providing an understanding of technology capabilities and expectations for appropriate use will fall to educators. In fact, the U.S. Department of Education, in conjunction with the efforts of the No Child Left Behind Act, has established a National Education Technology Plan to encourage and inspire technology transformations in schools, so that the instruction provided to students, not just access to technology, will mirror the technology-driven world they live in (U.S. Department of Education, 2006, National Education Technology Plan). In response, the State Board of Education has established a Long-Range Plan for Technology, 2006-2020, that focuses on teaching and learning; educator preparation and development; leadership, administration, and instructional support; and infrastructure for technology; TEA completes a biennial report that evaluates progress toward implementation of this plan (TEA, 2007, Educational technology: Long range plan for technology, 2006-2020). Technology implementation is reported annually by every teacher on the Texas STaR (School Technology and Readiness) Chart, which is then compiled into a campus and district report to document the progress on NCLB to support continued technology funding (TEA, 2011, STaR Chart).

With the rigor and the weight of statewide assessments increasing as Texas students move from taking the TAKS test to EOC exams, schools will need to evaluate

their writing instruction to verify that they are preparing students for these assessments that will require varied and more demanding writing responses and that will also be weighted as a percentage of the course grade. Schools must also examine their curriculum for college and career readiness preparation and must follow up on their students' admission and then success in higher education and their selection for employment. In addition, schools must transform their educational practices to incorporate technology in real-world ways to ensure students are ready to use technology both personally and professionally. Principals are given the torch as the school's instructional leader to guide teachers to planning effective writing instruction that reaches each and every student, regardless of their racial or ethnic background, and that prepares them for the world after high school. This educational leadership is crucial to guiding a school to meet the needs of its students and closing the achievement gap among them.

Statement of the Problem

Communication and technology skills are needed for success in both higher education and job experiences. As access to technology increases in our public schools, administrators must review how the integration of this technology to teach writing will prepare students not only for success in their high school work and on state-mandated exams but also for college and the workforce. This study of technology will help them to make the best instructional and budget decisions for their students. There is currently a gap in the research about how integration of technology impacts the writing that students produce in their English classrooms. To evaluate the use of technology in the classroom,

administrators can examine the writing philosophies and instructional practices of their teachers for teaching writing and for integrating technology in their classrooms. This evaluation will assist administrators in planning effective professional development on the integration of technological skills in the teaching of writing. There is need for further research on the impact of using technology to teach writing, and this study may provide important information about using technology to teach writing to enhance student writing and ultimately prepare students for college and careers.

Purpose of the Study

The primary focus of this study is an exploration of the implementation of technology to enhance curriculum development and instructional strategies in the teaching of writing in English classes in diverse, low-income high schools in Texas. These schools include suburban and urban schools in major cities, rural schools along the Texas-Mexico border, and urban schools in coastal areas. The 10th and 11th grade English teachers in these purposively-selected diverse, low-income schools in Texas with 70 percent or more students classified as economically disadvantaged were initially surveyed for quantitative and qualitative data analysis. The survey examined levels of technology implementation in their classrooms, the teachers' current instructional practices, and their personal computer use as they relate to their levels of implementation, as well as the teachers' ages, years of teaching experience, highest degrees earned, and type of school. Data collected from the survey was analyzed using quantitative statistics. Follow-up interviews were conducted with 12 percent of the survey respondents to gather data for qualitative analysis. Information gathered through

the interviews was unitized to designate emergent categories and form hypotheses (Erlandson, Harris, Skipper, & Allen, 1993).

Research Questions

The following research questions were posed:

1. Is there a relationship between levels of technology implementation in the writing classrooms of diverse, low-income high school students in Texas and the teachers' age, teachers' years of teaching experience, teachers' highest degree earned or the type of school?
2. What are writing teachers' perceptions of their self-reported concerns of technology integration and their possible solutions?

Operational Definitions

End-of-Course exams: these exams replace the grade-specific TAKS tests beginning with freshman students in the 2011-2012 school year and will include the following courses: Algebra I, Geometry, Algebra II, Biology, Chemistry, Physics, English I, English II, English III, World Geography, World History, and U.S. History

Economically disadvantaged: the Texas Education Agency defines these students as ones eligible for free or reduced-price lunch, according to federal guidelines for the National School Lunch Program, or eligible for other public assistance

Adequate Yearly Progress (AYP): the accountability system of the No Child Left Behind Act of 2001 that requires each school meet certain goals (annual measurable objectives) to determine that they have made adequate yearly progress for all students,

including those identified as economically disadvantaged or low income, as well as students of various racial or ethnic groups

STAAR: State of Texas Assessments of Academic Readiness; the STAAR program replaced the TAKS tests in high school with course-specific exams called End-of-Course (EOC) exams

College and Career Readiness Standards: educational standards that reflect what high school students must know in order to be successful in higher education and beyond; mandated by the 73rd Legislature and created jointly by the Texas Higher Education Coordinating Board (THECB) and the Texas Education Agency (TEA); standards are woven into the instructional standards for Texas public schools, known as TEKS, and will be included in state-mandated exams, known as STAARR end-of-course exams; English III and Algebra II assessments include a college readiness component and performance expectations that will be used by Texas public higher education institutions as the measure of eligibility for entry-level college courses

Technology: the application of and engagement with both computer hardware and software and other technical equipment, such as Smart Boards, projectors, document cameras, student-response clickers, smart phones, eBooks, touch-pad devices

Assumptions and Limitations

Assumptions:

1. The researcher will be impartial in collecting and analyzing data.
2. The interpretation of the data collected will accurately reflect that which was intended.

3. The respondents surveyed will objectively and honestly answer the questions posed to them regarding the study.
4. The individual who receives the survey will be the individual who completes the survey.
5. The instrumentation used in this study will be able to measure the relationship between the use of technology and student success in writing.

Limitations:

1. The scope of this study will be limited to teachers who teach 10th and 11th grade English at the schools selected for the survey.
2. The findings of this study may not be generalized to any other group than the teachers who responded to this study.

Significance Statement

The integration of technology in the teaching of writing may affect the development of writing skills, as well as college and career skills, for students in diverse, low-income schools. In order for writing teachers to effectively use technology to enhance the curriculum and their instructional strategies, they must be trained, and this professional development must be adequate enough to help each teacher acquire skills that they can later apply on his or her own. The knowledge gained through such training should meet the needs of these teachers while accounting for differences in their pedagogical beliefs, teaching practices, and experience with technology resources. Teachers can then positively impact the writing instruction they offer their students to help them develop skills for written communication in high school and in their future

careers and collegiate endeavors. Instructional leadership from the principal and other administrators is crucial to the success of this process.

Chapter Conclusion

This study was developed from my interest in how best to implement technology in writing classrooms and my understanding of the challenge of equity in public schools. Schools must understand anticipated employment changes so that they are adapting curriculum to meet the needs of their students to prepare them for careers and college, as well as statewide assessments for Adequate Yearly Progress (AYP) under the No Child Left Behind federal accountability system. Additionally, technology is increasing at a rapid rate; therefore, integrating available technology into appropriate learning opportunities for students will fall to educators. The primary focus of this study was an exploration of the implementation of technology to enhance curriculum development and instructional strategies in the teaching of writing in English classes in diverse, low-income high schools in suburban, urban and rural areas in Texas with 70 percent or more students classified as economically disadvantaged. The 10th and 11th grade English teachers in these purposively-selected schools were initially surveyed to examine levels of technology implementation in their classrooms as they relate to their levels of implementation, as well as the teachers' ages, years of teaching experience, highest degrees earned, and type of school. Data collected from the survey was analyzed using quantitative statistics, and follow-up interviews were conducted with 12 percent of the survey respondents to gather data for qualitative analysis.

CHAPTER II

REVIEW OF LITERATURE

Introduction

The purpose of this chapter is to provide a summary of the existing literature related to composition theory, the use of computers to teach writing, the effect of standardized tests on writing and writing instruction, technology standards for teachers and students, disparities in digital access among age and economic groups, the impact of low family income on learning, secondary education's role in college and career preparedness, and the principal's role in curriculum and instruction planning.

Composition Theories

A discussion on how best to teach writing will usually yield many differing ideas. A variety of approaches or pedagogies are embraced by writing teachers. To understand the richness of the field, an analysis of some of these discourses can underscore the differences and similarities in teaching practices. A process approach to writing focuses on opportunities for students to free write (writing non-stop for a period of time without concern for grammatical correctness), to experiment with words to discover their voice, to collaborate with other students through editing and revision, and eventually to publish their work (Tobin, 2001). The goal of the process pedagogy focuses on a classroom workshop setting that includes peer and teacher response to writing to develop a community of writers (Tobin, 2001). A meta-analysis to identify the most effective instructional practices for teaching writing to adolescents determined that

peer assistance and process writing approaches were among the top interventions (Graham & Perin, 2007). Process writing involves students learning both the mental process of writing, as well as the practical processes of composition (Ivanic, 2004). Research by Graham and Perin (2007) found that writing instruction on planning, drafting, and editing were among the most effective writing treatments. Kessler (2005) found that students became more engaged in their writing when the publication aspect of the writing process, what she refers to as “composing for delivery,” allowed for writing that would be read by real audiences. This allows for an authentic consideration of audience and purposes and links the writing process to the product in order to prepare students for writing beyond the classroom (Kessler, 2005). Assessment of process compositions may focus on the final product itself with the process as a means to the end, or it may include an evaluation of the quality of the process or a reflection by the student on the process of creating the final product (Ivanic, 2004).

Similarly, the collaborative pedagogy involves small group discussion on writing, students editing the work of their peers to make suggestions for improvement on a draft, and students working collaboratively on one piece of writing (Howard, 2001). Ivanic (2004) calls this theory a social practices discourse in which students write in real-life contexts and with real purposes. This practice of writing is often recommended because it prepares students for writing in the work-place (Howard, 2001). Preparing students not only for work, but also for interactions with the world, is the focus of composition theory linked to cultural studies. This instructional approach involves writing connected to texts from popular cultural and media with a focus on close reading

of the material and personal responses to the work (George & Trimbur, 2001). While the popular cultural text serves as the catalyst of the writing and subsequent discussion among peers, a criticism of this ideology is that less emphasis is placed on writing instruction (George & Trimbur, 2001).

The writing center pedagogy focuses on opportunities to write in a place where one-on-one and small group tutorials can occur to increase students' writing development differently than the activities in a writing classroom (Hobson, 2001). In a writing center, the trained personnel, who will not grade the students' work, can provide guidance to assist writers in analyzing their writing styles, and not just their particular text, with a goal of improving the writer rather than simply the writing (Hobson, 2001).

In his *Research on Written Composition*, Hillocks (1986) examined three modes of instruction: presentational, natural process, and environmental. He describes the presentation mode as one led by the instructor with clear objectives established, teacher-led lecture and discussion on concepts, the study of exemplary models, specific writing assignments, and teacher feedback on the writing (Hillocks, 1986). In contrast, the natural process mode emphasizes general objectives to increase fluency, free writing, writing for peers, feedback from peers, revision, and interactions among students about the writing (Hillocks, 1986). While the environmental mode also involves student interaction and a process approach to writing, it differs from the natural process mode by offering specific objectives with a focus on details and figurative language and assignments linked to specific aspects of writing (Hillocks, 1986). Hillocks (1986) concludes that the natural process mode is three times more effective, and the

environmental mode is four times more effective than the presentational mode of writing instruction for grades 6-13 in particular. This research led to his book *Teaching Writing as Reflective Practice* in which he offers ideas for integrating theory and practice into a sequence of varied activities, a combination of knowledge and methods, for students that improve their writing performance from their present levels (Hillocks, 1995). Ivancic (2004) proposes a comprehensive pedagogy for teaching and assessing writing that involves progressively embedding and connecting the writing text, process, event, and context of multiple discourses of writing instruction.

The National Writing Project (NWP), a professional network to assist teachers of writing, includes more than 200 sites sponsored by universities and colleges across the nation to lead summer institutes for teachers focused on the teaching of writing, to deliver professional development to schools on writing instruction, and to provide continual education and research opportunities for writing teachers (Kaplan, 2008). The core ideology of the NWP is that writing can be taught, rather than assigned to students, that writing is both an art and a craft, and that writing is a process approach that includes recursive steps of planning, drafting, revising, editing and publishing (Kaplan, 2008). The NWP summer institutes provide teachers with opportunities to learn and reflect on best practices to improve the teaching of writing and to develop a community of learners who will support each other, long after the institute experience, in focusing on these best practices of instruction (Kaplan, 2008).

Integration of Computers in Writing Instruction

In planning professional development that leads to student success in English Language Arts classes, administrators and teachers should consider how the integration of technology impacts the teaching of writing. The National Commission on Writing in America's Schools and Colleges (2003) recommends that technology be employed in classrooms as it can advance both the teacher instruction and student learning. The Commission further emphasizes that technology can be a tool to save time for students and teachers, thus expanding time spent on writing, and that research in technology must investigate emerging technologies that can further improve writing and writing instruction (The National Commission on Writing in America's Schools and Colleges, 2003). Good and Brophy (2008) report that a variety of studies indicate the quality of writing is enhanced by the use of computers. In a laptop initiative in a low-income school, results indicated that student motivation and engagement increased, and that students in the program made gains in writing as compared to their peers who were not in the program (Mouza, 2008). In a study of 152 low-achieving eighth-grade Hispanic students, students who used computers to compose their writing scored 20 percent higher on their writing rubric than their peers who composed writing using pen and paper (Lerew, 1997). In addition, the study also found that the students with the lowest writing skills made the largest gains in their writing when using a computer to compose their work (Lerew, 1997). Computers can aid in the generation of ideas and then the organization of text, can offer feedback to assist with efficient revision and editing, and can create a community of networked writers (Bruce & Levin, 2003). Teachers may

assume that students do not write on their own or lack any mastery over their own writing skills; however, many students have spent hours composing on computers on their own before they ever enter the writing classroom (Taylor, 1994). Therefore, networking students with computers can offer a familiar experience for them and can eliminate writing that is only completed for an instructor. In turn, instruction can focus on dialogue between students that create a body of knowledge shared among the class (Taylor, 1994; Barker & Kemp, 1990).

The Daedalus Instructional System provides opportunities for students to dialogue in writing about texts without privileging one student over another and without control of the teacher, as is usually the case in a traditional classroom discussion (Barker & Kemp, 1990). In this computer-networked system, students can scroll back to read previously posted messages, they can respond to others while also initiating discussion, and the teacher can participate as more of an equal than he or she is in the traditional classroom discussion (Barker & Kemp, 1990). Computer-mediated class discussions like this that require students to write comments and then receive immediate responses from peers resulted in greater equity among students in their participation as compared to discussions in the classroom; thus, not only are students writing and reading as compared to speaking and listening, they are also increasing the number of participants, ideas, and feedback presented to the class (Farnan & Dahl, 2003).

Computer-mediated discussions also provide the opportunity for the student to serve as a teacher among his or her peers (Barker & Kemp, 1990). The mode of teaching, the roles of the instructor, and the students' role in the classroom all change as

a result of these computer-networked discussions. Since the discussion does not revolve around the teacher, but around the students and their ideas, they are empowered to set their own agendas (Miller, 1991; Skubikowski & Elder, 1990). The mode of teaching moves from a presentational format of lecture and feedback controlled primarily by the teacher to a situation where the students are more strongly involved and engaged, and research on learning suggests that engaged students learn more (Langston & Batson, 1990). Teachers can also take a more active coaching role when the teacher and writer communicate with each other on the network (Langston & Batson, 1990; Skubikowski & Elder, 1990).

Research by Langston and Batson (1990) found that groups working online showed a more evenly distributed pattern for interaction among all students than face-to-face groups did. Students do not need to wait their turn to respond but can simultaneously type their comments, and students have a chance to revise their comments before posting them on the network (Miller, 1991). Timid and shy students are more likely to respond; questions or comments that are not easily shared in person are often posted; and typical distractions, such as delivery style, appearance, or accents, are reduced or diminished (Miller, 1991). In all, students are writing to a real audience with a real purpose through a networked classroom, which helps students develop authentic communication skills more easily than writing an essay at home (Miller, 1991; Skubikowski & Elder, 1990).

Writing through networks can be a social activity between the writer, the writing, and the audience, which increases participation and collaboration (Flores, 1990). Flores

(1990) promotes the idea of collaboration to create a feminist paradigm where “every student has a voice and can engage in dialogue with each and every member” of the classroom to provide equal access and opportunity to consider other voices of opinion. This provides an opportunity for women to participate in a way often neglected in a typical discussion setting where studies indicate that men often interrupt women, hold the floor longer, and choose topics of conversation more frequently (Flores, 1990). Computer conferencing can empower female students and change the classroom dynamics by achieving equality (Flores, 1990). In addition, networked classrooms can also provide opportunities for written interaction with students in distant locations so that writing becomes a medium of exchange rather than a self-conscious performance (Langston & Batson, 1990).

Furthermore, students who used computers for composing tended to write longer compositions, to produce text free of surface errors, and to revise more of their work as compared to their peers who composed with paper and pencil (Warschauer, Arada & Zheng, 2010; Farnan & Dahl, 2003; Moeller, 2002; Nichols, 1996; Bangert-Downs, 1993). These students also take more initiative and are willing to experiment and take risks, spend more time on assignments and more time on task, show more enthusiasm and positive attitudes toward writing, feel more empowered, and are more engaged with the text (Warschauer et al., 2010; Kajder, 2003; Moeller, 2002). In addition, students who compose on the computer as opposed to using paper and pen are more aware of the recursive process of writing, are more able and willing to revise, and are better prepared for real world writing experiences (Moeller, 2002). Revision on the computer increases

as students have an easier time completing the tasks than they would if they were required to rewrite an entire paper (Moeller, 2002). Kajder (2003) suggests students track their drafts rather than revising a single copy of writing to see how their text has developed. As part of the revising and editing process, students can also maintain a writer's journal that reflects on their written work, color code parts of their papers (topic sentences, supporting ideas, transitions, etc.), combine sentences using cut and paste functions, and annotate writing using the comments feature in word processing programs (Kajder, 2003).

Peer revision can also occur on the computer with students typing comments directly into the original text. The use of networked computers or email as an instructional tool for peer critique can offer several advantages, including a permanent record of the text as compared to an oral exchange where a writer may forget or misunderstand a comment, a critique of a student's work that involves the production of writing, and the elimination of distracting aspects of face-to-face communication, such as body language, voice, or speech mannerisms (Taylor, 1994). Studies have shown that students are more willing to make comments on computer-generated text than on handwritten papers (Moeller, 2002). Computer-processed writing is also neater and easier to read than handwriting; students are also aware of this factor and prefer to type work that will be evaluated (Moeller, 2002). This format also eliminates the difficulty of peer reviewing an illegible handwritten text and offers the opportunity to easily color-code comments from different peers (Moeller, 2002).

Computers can also offer a format for publication of student writing (Moeller, 2002; Barker & Kemp, 1990). In a case study of a university-based reading laboratory, struggling readers and writers used technology to improve their skills and eventually published their original compositions on their own web pages and corresponded with people all over the world about their work, and in the process, they became more proficient readers and writers (Wood, 2004). In *The Tech-Savvy English Classroom*, Sara B. Kajder (2003) suggests that publishing on the web and in print and multimedia presentations provides opportunities for students' voices to extend beyond the classroom. A portfolio of student work can be easily organized on the computer, and students can use the computers for read-arounds, completion of writing exercises, and the creation of collaborative writing products (Kajder, 2003; Moeller, 2002). Technology can also increase literacy skills in word recognition, fluency, comprehension, vocabulary, reading and writing across the curriculum, process writing, and motivation, all skills identified as essential to literacy development (Wood, 2004). Research has even focused on the use of computer games to enhance writing instruction, based on the emergent pedagogy that emphasizes play as an important part of the writing process (Colby & Colby, 2008). In the study, college students who played the multiplayer online role-playing game *World of Warcraft* and then composed self-determined, rhetorically-focused writing projects based on their play and written for the other gamers engaged students in an analysis of how their writing was deconstructed by audiences and how to subsequently write for their audience (Colby & Colby, 2008).

However, challenges can exist in the use of a computer format for instruction in writing. Because students are still assessed via paper and pen written products, they must still be provided opportunities for practicing the completion of such tasks (Moeller, 2002). Also, the configuration of the computers, hardware and software incompatibility, and machine malfunction can pose significant problems (Gerson, 1993). Often, computers are installed against the classroom walls where electrical outlets are located. In this arrangement, students must sit with their backs to the teacher and each other. Creating clusters of computer workstations provides for better control of students' attention and more convenience for student collaboration (Gerson, 1993). Needs related to hardware and software often cannot be controlled as these issues are usually tied to budgets (Gerson, 1993). However, teachers can get involved in budget decision-making in an attempt to impact this obstacle (Gershon, 1993). Finally, computer malfunction can leave a teacher feeling helpless, but trained technicians can often assist teachers with problems; in addition, the more experience a teacher gains with the computers, the more often he or she can solve a the problems as they occur (Gerson, 1993; Skubikowski & Elder, 1990).

The amount of time and frequency that students compose on the computer influences their overall writing success (Moeller, 2002). Edward Wolfe and other researchers found that “students with no access to computers outside of school received scores almost a full standard deviation lower when their essays were produced with a computer” (as cited in Moeller, 2002, p. 45). A lack of computer accessibility results in a lack of computer facility, which results in writing that is more inferior in quality and less

in quantity (Moeller, 2002). Until computers are accessible to all students, these differences will continue; therefore, by increasing access to computers at school, these discrepancies can decrease.

Computers should not become a replacement for best instructional practices in the teaching of writing. The primary objective should be increased literacy by using computers to enhance thinking, decision-making, and problem-solving skills and to link people together while maintaining human communication (McKenzie, 2000). An effective use of technology to increase thinking and writing skills emphasizes student questioning, research, issue resolution, and higher-order thinking skills to solve authentic problems with technology as the tool rather than the focus (Moersch, 1998). Teachers must also remember to use technology as one tool among many, model the collaboration expected on the computers, allow students some choice in how best to use the technology, and provide an appropriate level of difficulty with lessons to maintain student interest and engagement (Moeller, 2002).

The Effect of Standardized Tests on Writing and Writing Instruction

One belief of the National Writing Project (NWP) is that teachers are now so focused on high-stakes testing that best practices for teaching writing are undermined by the pressure for improved student performance on state-mandated tests (Kaplan, 2008). One result of the NWP summer institutes has been the development of cadres of teachers who can present workshops on the effective teaching of writing, with consideration of the writing sections of these state-mandated exams that students must pass to graduate (Kaplan, 2008). A study of 10th grade English teachers in public schools in

Massachusetts found that teachers had changed their instructional practices so that students would pass the Massachusetts state tests and so that schools could improve their student scores (Vogler, 2002). However, the changes in practice included an increase in what educational researchers deem as best practices, including the use of open-response questions, use of rubrics or scoring guides, increase in writing assignments, and a decrease in multiple-choice or true-false questions (Vogler, 2002). Best practices in the teaching of writing that can still maintain successful student results on state-mandated assessments also include teaching students to write in a variety of genres, providing time for revising and editing, allowing students to write on their choice of topics, and encouraging creativity, all facets of the writing process and writing workshop (Higgins, 2006). The highest test scores are often produced in the broadest and richest preparation in writing and with instruction that does not focus only on skills assessed on the state-mandated tests (Higgins, 2006). Effective writing instruction results in better writers, which leads to better test scores on writing tests (Higgins, 2006). Although state-mandated assessments may not develop thorough accountability, it has increased teachers' reflections on their practices in writing instruction resulting in changes that can ultimately benefit students (Callahan & Spalding, 2006).

One aspect of effective instruction that can assist with improved test scores is the inclusion of formative assessment to provide feedback on writing performance (Hollingworth, 2008). Students can track their progress over time, identifying strengths and weaknesses and strategies for improvement (Hollingworth, 2008). The inclusion throughout the school year of challenging reading and writing tasks similar to state

assessments demonstrates a more educationally sound instructional method for test preparation than test drills or limited preparation one or two weeks before assessments (Parke, Lane, & Stone, 2006). Recently, computer software that evaluates student writing on practice for state assessments has generated both praise and concern. The use of computers for practice sessions before the state writing tests increased motivation to write and increased the quantity of the writing in a study of fifth grade students (Daniels, 2004). These students also had increased test scores, particularly among African American students (Daniels, 2004). Although the use of computers enhanced the writing instruction, effective teaching practices and students' structural knowledge of the writing assessment were also key to success (Daniels, 2004). While this software can increase opportunities for students to write and then quickly receive feedback to improve their writing within the confines of the state assessment expectations, teachers must not allow such writing to become the only focus of the writing curriculum (Thomas, 2005).

The threat that standardized testing has on writing and writing instruction is that teachers who fear punishment over low test scores will create curriculum in which students will only be taught to write for the anonymous test evaluators (Williams, 2005; Messenheimer & Packwood, 2002). The real purpose of learning to read and write—to communicate with others—can be lost to standardized assessments (Williams, 2005; Messenheimer & Packwood, 2002). In order to ensure student success on these assessments, many teachers understand the criteria required for writing that meets this standard and may teach students to meet that criteria rather than to create meaningful texts (Williams, 2005; Messenheimer & Packwood, 2002). A national survey of teachers

found that many believe they are decreasing the use of technology to teach writing as a result of paper and pen state assessments (Russell & Abrams, 2004). In addition, the computing skills of students in urban and low-performing schools are reported by teachers to be less developed than the skills of students in suburban and high-performing schools; thus, the students who need the opportunity to increase their computing skills are faced with a decreased chance to do so (Russell & Abrams, 2004).

Technology Standards for Teachers and Students

In response to the education reform required by the No Child Left Behind Act, the U.S. Department of Education developed the National Education Technology Plan to encourage and promote technology-driven instructional changes (U.S. Department of Education, 2006, National Education Technology Plan). The plan motivates instructional leaders to provide creative and transformative changes in education so that students can benefit from the ever-changing information and communication technology; recommendations for states, districts and individual schools include:

- Invest in leadership development programs to develop a new generation of tech-savvy leaders at every level.
- Retool administrator education programs to provide training in technology decision making and organizational change.
- Develop partnerships between schools, higher education and the community.
- Encourage creative technology partnerships with the business community.
- Empower students' participation in the planning process (U.S. Department of Education, 2006, National Education Technology Plan).

The plan also recommends innovative budgeting to acquire technology resources, improved teacher training, support of e-learning and virtual schools, increased broadband access for students and teachers, a move toward digital content, and an integration of data systems (U.S. Department of Education, 2006, National Education Technology Plan).

Similarly, the Texas Education Code requires that professional development be provided to all teachers based on standards developed and designed by the local school district to improve the education of its students (Texas Education Code, 2003, Ch. 21.451). These standards must include technology training and must be developed and approved by the campus-level committee to address campus performance objectives, such as student performance on the TAKS test and EOC exams (Texas Education Code, 2003, Ch. 21.451). The Code further indicates that technology is a required component of the students' education in order to prepare them for the 21st century; therefore, each school system should use technology in all areas of instruction (Texas Education Code, 2003, Ch. 32.031). In response to chapter 32 of the Texas Education Code, the Texas Education Agency has developed a Long Range Plan for Educational Technology; this plan notes that educator training in using technology tools must be a priority for both new teachers and experienced educators (TEA, 2007, Educational Technology: Long Range Plan for Technology, 2006-2020). In response, the State Board of Educator Certification (SBEC) established Technology Applications Standards and certificates for those educators in teacher preparation programs; these are part of the Texas Examination of Educator Standards (TExES) framework in Pedagogy and Professional

Responsibilities (TEA, 2007, Educational Technology: Long Range Plan for Technology, 2006-2020). The plan also notes that the No Child Left Behind Act of 2001 requires local school districts receiving federal funds to develop training that will assist in the integration of technology in classroom instruction (TEA, 2007, Educational Technology: Long Range Plan for Technology, 2006-2020).

In addition, the International Society for Technology in Education (ISTE) established National Educational Technology Standards (NETS) for teachers to engage students and improve learning, to enrich professional practice, and to provide positive models of technology use (International Society for Technology in Education, 2008). The five standards for teachers include the following:

1. Teachers use their knowledge of subject matter, teaching and learning, and technology to facilitate experiences that advance student learning, creativity, and innovation in both face-to-face and virtual environments.
2. Teachers design, develop, and evaluate authentic learning experiences and assessments incorporating contemporary tools and resources to maximize content learning in context and to develop the knowledge, skills, and attitudes identified in the student NETS.
3. Teachers exhibit knowledge, skills, and work processes representative of an innovative professional in a global and digital society.
4. Teachers understand local and global societal issues and responsibilities in an evolving digital culture and exhibit legal and ethical behavior in their professional practices.

5. Teachers continuously improve their professional practice, model lifelong learning, and exhibit leadership in their school and professional community by promoting and demonstrating the effective use of digital tools and resources

(International Society for Technology in Education, 2008).

Since 1998, the NETS have served as a guide to improve learning and teaching and to help measure proficiency and set goals for what students, teachers, and administrators should know and be able to do with technology in education (International Society for Technology in Education, 2008). In addition to the teacher standards, student standards have been developed with six performance indicators including communication and collaboration that specifies students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others, which relates directly to the English classroom (International Society for Technology in Education, 2007).

The use of technology in instruction is often related to a variety of factors. In a review of the literature to determine teachers' attitudes about technology in the 1990's, teachers generally had a positive attitude about technology, and those who used computers themselves were more likely to use computers in the classroom as well (Dupagne & Krendl, 1992). In addition, computers are both influenced by and impact the environment in which they are used. For example, the use of computers for word processing is both a social and technical practice that is dependent on the social system of the classroom (Cochran-Smith, 1991). The teacher's attitude, classroom management style, and goals for writing influence the use of the computer in the classroom (Michaels,

1990). In addition, technology training must also include problem-based learning so that teachers are designers who learn to use technology in creative and innovative ways to meet their teaching goals (Koehler & Mishra, 2005).

The teachers' belief system about the learners in their school, as well as their ideas about what good teaching involves and what role technology plays in students' lives, will also impact the use of technology in the classroom (Windschitl & Sahl, 2002). In addition, lack of resources and their views of the prescribed curricula also impacts technology integration and reflective practices about learning (Mouza, 2011). In their study, Windschitl and Sahl (2002) found that teachers would assess the ability of the technology to create learning opportunities that matched their beliefs about the students and their learning needs. The teachers also attempted to match their technology decisions with their instructional beliefs about whether the control in the classroom belonged to teachers or students (Windschitl & Sahl, 2002). Although teachers' use of technology was impacted by other teachers' use in their school, the collective result was still based on pedagogical beliefs (Windschitl & Sahl, 2002). Thus, in creating meaningful professional development, administrators should take time to focus on teacher beliefs and their concerns in order to help them understand why they should alter those beliefs and/or practices with technology (Stein, Campbell, and Ginns, 1999).

Teachers will more readily make changes in their pedagogical beliefs and practices if they can see how technology impacts student learning (Stein et al., 1999). This connects to why some teachers still do not employ technology in their curricular plans even when they have computers available to use. In two technology-rich Silicon

Valley high schools, two-thirds to three-fourths of the teachers were non-users of the media centers in the school (Cuban, Kirkpatrick, & Peck, 2001). This non-use is attributed to the slow transformation of learning how to use and manage the technology available; the lack of time to find, learn, and then apply software to the curriculum; and the unreliability of technology that can erode confidence in its use (Cuban et al., 2001).

In addition to these factors, computer expertise, gender, availability of district technology support personnel, available training, and teaching experience can determine the frequency of the use of computers in classroom instruction (Chiero, 1997; Dupagne & Krendl, 1992). A nationwide survey of teachers experienced at integrating technology in their instruction indicated three key factors to their accomplishments in this integration: motivation and commitment to both their students' learning and their own development as teachers, the support in their schools and districts for integrating technology, and access to technology (Hadley & Sheingold, 1993). The results of that survey are echoed in the data of a national survey seeking to understand the difference between teachers who are exemplary at using computers in the classroom as compared to other teachers; these differences focused on a social network of other teachers who use computers and resources allocated for support, personal experience with computers, and teaching practices (Becker, 1994). These teaching practices can be defined as a constructivist approach to instruction, and teachers who changed their instructional practices to such a style also have the most frequent computer and Internet use in their classrooms (Becker & Ravitz, 1999). A collaborative system for technology integration would involve teachers experienced with effective use of technology serving as mentors

to their peers to model, teach, evaluate, and support technology integration in the school (Glazer, Hannafin, & Song, 2005). In addition, professional development built on the research regarding the best practices of teaching and sustained over time changed not only teacher knowledge of educational technology and their beliefs about student learning with technology, but also teacher ability to design and then implement instruction supported with technology (Mouza, 2009). Mouza (2009) focused her research on seven urban teachers who participated in a year-long professional development on technology integration designed and implemented by the Institute for Learning Technologies at Columbia University as part of the Eiffel Project, a program to immerse K-12 students with technology in their classrooms, and the results of their experience two years afterward.

The role of the traditional English teacher must also adapt in order for technology to be effectively integrated into the writing classroom (Kajder, 2003). Teachers need to become instructional designers who create challenging curriculum and standards-based lessons that integrate technology in effective ways, researchers who determine when best to use technology and then evaluate its implementation, and communication specialists who know how to facilitate students' writing and reading experiences through online communication (Kajder, 2003). The teacher does not need to become a technology expert; school districts should provide technicians to maintain the hardware and networks; the role of the teachers should be focused on thinking critically about how technology can enhance instruction, designing innovative instructional strategies, and assessing student products (Kajder, 2003).

Impact of Low-Income Status on Students' Learning

According to the census in 2003, more than 12 percent of the U.S. population lived in poverty, and this number has increased to more than 15 percent in 2010 (U.S. Census Bureau, 2011; Reyes, 2006). Texas has one of highest percentages of children at or below the poverty level with more than 25 percent identified as poor in 2010 (USDA, 2011; Reyes, 2006). During the 1998-1999 school year, 48.4 students were identified as economically disadvantaged; by the 2008-2009 school year, that number had increased to 56.6 students, with 77.6 of Hispanics and 68.6 of African American school children identified as economically disadvantaged (TEA, 2009). Research focused on closing the achievement gap between students of different ethnic groups consistently notes the connection between socioeconomic status and student achievement (Reyes, 2006; Tajalli & Opheim, 2004). The authors of *Using Equity Audits to Create Equitable and Excellent Schools* focus on the fact that achievement equity cannot be achieved without considering equity in teacher quality and programs (Skrla, McKenzie, & Scheurich, 2009). Studies have found a strong correlation between poverty and achievement (Reyes, 2006; Tajalli & Opheim, 2004). Specifically, research on achievement data for the TAKS test found that students from non- economically disadvantaged school districts passed the TAKS tests at rates from 20 percent higher in 3rd grade to more than 100 percent higher in high school than students at economically disadvantaged districts (Reyes, 2006). In addition, at-risk students are defined as students who are likely to drop out of high school before graduating. Among factors that define a student as at-risk are low achievement, low income status, and attendance at a school with a high population

of low income students (Reyes, 2006). Certainly, the challenges for schools with 70 percent or more economically disadvantaged students are great according to the research as students are likely to face low achievement and risk failing to complete high school.

In addition, students who are classified as low income benefit from smaller schools, while affluent students can achieve in larger schools, and class size can also positively impact student achievement for low income students as smaller classes encourage student engagement, interactions with the teacher, and innovative instruction, while decreasing time for discipline and feelings of isolation (Tajalli & Opheim, 2004). However, these factors are often not controlled by administrators, staff, or students. How money is spent can usually be decided by school staff, as these expenditures seem to impact achievement; most effective in high-poverty schools is money spent toward rewarding “highly rated” teachers and toward supplies and maintenance (Tajalli & Opheim, 2004). In an analysis of variables that impact student success, Tajalli and Opheim (2004) focused their research of 97 10th grade schools in Texas with 50 percent or more of the students classified as economically disadvantaged on socioeconomic status, school characteristics (such as school size and student/teacher ratio), teacher characteristics (salary and expenditure) and expenditure per pupil. They found that the number of economically disadvantaged students impacts the achievement of the school, so that as the percentage of these students’ increases, the odds of the school being a high-performing campus drops (Tajalli & Opheim, 2004). These low-income students often battle the low expectations that teachers and schools may have for them (Reyes, 2006). Teacher quality, which includes teacher education, experience, and certification,

along with teacher mobility on the campus, can impact the equity of education for students (Skrla, McKenzie, & Scheurich, 2009). For example, teacher experience impacts student achievement in high school so that as teacher experience increases so does the likelihood that the school will be high-performing (Tajalli & Opheim, 2004). In their study, however, the researchers found no correlation between school achievement and school size, class size, or expenditure per pupil (Tajalli & Opheim, 2004).

In addition, low-income students may face different challenges in attempting to use computers at home as compared to students from higher socio-economic background who usually have increased financial resources and larger support networks and then increased accessibility to technology at home (Baek & Freehling, 2007). The achievement gap between students without access to technology at home and at school and students with that access impacts college admission, college readiness, and workforce skills (O’Kane, 2010). Therefore, access to computers at school is critical to providing opportunities for low-income students to engage with technology (O’Kane, 2010).

Children of poverty can overcome many of these negative situations. The educator’s faith in the potential success of every student is key to transforming the educational experience of low-income students (Williams, 2006). Since culture often determines what is valued and how it is learned, teachers must be provided with professional development to understand the role of culture and its impact on development and learning for children whose culture or economic status may not prevail in their school environment (Williams, 2006). Valuing cultural diversity involves

understanding the role of culture in the learning process and using culturally-relevant teaching to highlight the cultural strengths of learners (Williams, 2006). When teachers deliberately emphasize the cultural relevance of students' experiences, they help improve achievement and decrease the gap that may exist between students (Williams, 2006). However, this professional development is not a "one size fits all approach" as all the teachers on one campus will have varying degrees of understanding and valuing cultural backgrounds or an "equity consciousness" (Skrla, McKenzie, & Scheurich, 2009). Principals will need to be change agents who can provide a variety of differentiated professional development opportunities that meet the teachers' needs (Skrla, McKenzie, & Scheurich, 2009).

In addition, schools that have successfully closed the achievement gap incorporated diversity, built on students' prior knowledge, demonstrated culturally responsive instruction, exhibited caring and trust, demonstrated leadership and a focus on service to students, aligned instruction to standards, provided ongoing professional development, offered additional time for instruction, and included meaningful community and parent involvement (Williams, 2006). Research of high-performing, high-poverty schools found four consistencies: school leaders with clearly articulated expectations of students' learning, along with a sense of urgency about student improvement; challenging curriculum and investment in professional development; teachers who critically evaluated their practices and abandoned what was not working; open classrooms that encouraged others to observe and evaluate instructional practices (Elmore, 2006). In addition, teachers should reflect collaboratively and continually on

their understanding of diversity, their assumptions and beliefs, and their teaching practices related to students of diverse cultural and economic backgrounds to review and revise when necessary their skills in teaching these students (Allard & Santoro, 2008).

Disparities in Digital Access

Socio-economic status and race are often among the factors that determine whether or not students have access to technology outside of school (O’Kane, 2010; Ono & Zavodny, 2008; Hoffman & Novak, 1998). Classroom computer access often decreases in districts with a larger population of African-American students, although this access has increased in these schools since the 1990s (Hess & Leal, 2001).

Prensky (2009) suggested that there also exists a divide between young people who have been exposed to technology during most of their lives and adults whose technology use is often not as diverse, which may include the teacher. However, he concedes that this distinction will continue to grow irrelevant over time (Prensky, 2009). Digital technology offers the opportunity to increase knowledge and understanding, regardless of age, and helps prepare students not only for college, but also for the work force (O’Kane, 2010; Prensky, 2009; Guo, Dobson, & Petrina, 2008).

As household income increases, the likelihood of owning a home computer also increases (Hoffman & Novak, 1998). In addition, districts that spend more per student have increased classroom computer access for their students, whether the district is suburban or urban (Hess & Leal, 2001). This must be addressed to bridge this digital divide so that all students, regardless of their income status or ethnicity, will have

regular access to computers at school to master the skills necessary for both post-secondary education and the work force (O’Kane, 2010; Judge, Puckett, & Bell, 2006).

Preparing Students for College and Careers

Preparing students for college is a relatively new endeavor for secondary schools; however, the U.S. Secretary of Education Arnie Duncan emphasized in the foreword of the Executive Summary for the National Education Technology Plan that an educated populous is vital for the economic growth and prosperity of our nation, as well as for the successful continuation of our democracy (U.S. Department of Education, 2010, Executive Summary for the National Education Technology Plan). ACT defines college and career readiness as the acquisition of knowledge and skills necessary for enrollment and then success in credit-bearing first-year courses at a postsecondary education institution (ACT, 2011). In some schools, past efforts have been focused mainly on preparing students to meet college entry requirements and assisting them with completion of college applications (Hafner, Joseph, & McCormick, 2010). A study of California high schools found that schools serving Latino, African-American, and low-income students often tracked those students into less-rigorous academic courses and Career and Technical Education (CTE) courses that even reduced college eligibility (Education Trust-West, 2011).

For those students who are admitted to college, many are not “ready” to complete college courses and require remediation in math, reading, and writing before beginning these basic college entry-level courses (Boatman & Long, 2012; Hafner et al., 2010). ACT has determined their College Readiness Benchmarks as the minimum score on the

ACT subject test, which indicates a 50 percent chance of earning a B or higher and a 75 percent chance of earning a C or higher in that subject's first-year, credit-bearing college course (ACT, 2011). Of those students who took the ACT in 2011, 28 percent did not meet any of the college readiness benchmarks (ACT, 2011). Although 77 percent of the white students met the benchmark for English, only 47 percent of Hispanic students and 35 percent of African American students met the benchmark for English (ACT, 2011). While these students are educated in a variety of schools across America, these disparities are a concern if readiness impacts college and career success. In the state of California, 33 percent of graduating seniors meet the entry requirements for admission to a California state university; however, 50 percent of entering freshmen need remediation in English or writing (Hafner et al., 2010). National statistics estimate that one out of three college students requires remediation, but some universities have as many as six out of 10 students enrolled in remedial courses (Boatman & Long, 2012). Enrolling in remedial courses initially requires extra time and money, in addition to increasing frustration and reducing self-esteem, so that students enrolled in these courses often obtain degrees at a rate lower than their peers (Boatman & Long, 2012).

To combat this problem in California, a statewide initiative to prepare these students before entering college focused on strengthening instruction in reading and writing; called The Early Assessment Program, this training of teachers focused on professional development, curriculum, and teacher-student-text interaction (Hafner et al., 2010). For teachers in urban, low-income schools in California, a study of this systematic approach to teaching expository reading and writing skills has resulted in

increased teacher proficiencies in instruction of writing, student confidence in their writing skills, and increased test scores in English (Hafner et al., 2010).

A rigorous curriculum focused on college and career standards, common expectations for all students, whether college bound or not, and clear performance standards are the keys to preparing students for success after high school (ACT, 2011). A study of college readiness by the Educational Policy Improvement Center focused on 38 high schools from urban, suburban, and rural areas, most serving large numbers of students who have been historically underrepresented in college, and identified as successful in preparing students for college (Conley, 2008). The study found several common practices that contribute to college readiness, one of which was designing curriculum around college readiness standards generally and on rigorous advanced placement courses specifically with vertically aligned course expectations, assignments, and goals in grades 9-12 (Conley, 2008). Furthermore, English teachers scored a writing sample using a common standard for all students, regardless of the course, and then met to share their scoring to avoid setting different expectations for different student groups (Conley, 2008).

Additionally, the issue of college readiness is both a state and federal concern. The United States once led the world in its number of young people who had completed college; now our country ranks ninth out of 36 developed countries (U.S. Department of Education, 2010, Executive Summary for the National Education Technology Plan). In response, the Obama Administration has communicated its vision to have America lead the world in its proportionate number of college graduates by the year 2020.

Specifically, the administration prioritized two key goals in education: to increase the number of college graduates with a two-year or four-year degree from the current 41 percent to 60 percent of the population and to close the achievement gap so that all students are graduates from high school prepared for success in college or in a career (U.S. Department of Education, 2010, Executive Summary for the National Education Technology Plan). To achieve these goals, the U.S. Education Department's Office of Educational Technology developed the National Education Technology Plan, *Transforming American Education: Learning Powered by Technology*, with a focus on using advanced technologies to enhance and improve learning, teaching, and assessment so that all students are prepared to advance to college and then graduate or are prepared for success in a career (U.S. Department of Education, 2010, Executive Summary for the National Education Technology Plan). The plan emphasizes that technology is at the core of the daily activities in both our professional and personal lives, and by leveraging its influence, educators can create more engaging instruction and more authentic assessments to increase student achievement (U.S. Department of Education, 2010, Executive Summary for the National Education Technology Plan).

The 79th Legislature of the state of Texas declared in House Bill 1 that schools must strive to increase the number of high school students who are prepared for college or a career when they graduate high school, and, therefore, required the Texas Education Agency and the Texas Higher Education Coordinating Board (THECB) to create a vertical team to develop College and Career Readiness Standards (CCRS) in core courses that indicate what students must know for entry-level courses in college courses

in Texas (THECB, 2009). The CCRS do not focus on what must be mastered in high school but emphasize the content knowledge that must be applied in college courses, as well as how that knowledge is organized and presented (THECB, 2009). The standards are organized to provide educators with key content, the organizing components for introducing the content and skills, specific performance expectations and challenge levels for a standard, and suggestions for ways in which a student would demonstrate performance in that standard (THECB, 2009). The English Language Arts Standards are included as both a stand-alone list and cross-disciplinary standards fundamental in all subject areas (THECB, 2009). The CCRS for writing in the ELA standards include the following:

A. Compose a variety of texts that demonstrate clear focus, the logical development of ideas in well-organized paragraphs, and the use of appropriate language that advances the author's purpose.

1. Determine effective approaches, forms, and rhetorical techniques that demonstrate understanding of the writer's purpose and audience.
2. Generate ideas and gather information relevant to the topic and purpose, keeping careful records of outside sources.
3. Evaluate relevance, quality, sufficiency and depth of preliminary ideas and information, organize material generated, and formulate a thesis.
4. Recognize the importance of revision as the key to effective writing. Each draft should refine key ideas and organize them more logically and

fluidly, use language more precisely and fluidly, use language more precisely and effectively, and draw the reader to the author's purpose.

5. Edit writing for proper voice, tense, and syntax, assuring that it conforms to standard English, when appropriate (THECB, 2009).

The Cross-Disciplinary Standards also include a writing component and a technology component that includes the following standards: use technology to gather information; use technology to organize, manage, and analyze information; use technology to communicate and display findings in a clear and concise manner; and use technology appropriately (THECB, 2009).

The Administrator's Role in Preparing Teachers to Incorporate Technology

Thinking about and acting on the future is what leads to a visionary, and thus successful, school administrator (Hoyle, 1995). These educational leaders must model ways to create the future they seek in order to gain the respect of their staff (Hoyle, 1995). Since the principal serves as a school's instructional leader, he or she must focus on how to incorporate best practices in the education of students, rather than quick fixes that rely on teaching to a test. If students' scores on state-mandated writing assessments do not indicate success for all student groups, administrators must identify the gap, conduct a needs assessment, set objectives, determine methods for meeting those objectives, and conduct evaluation of the results (Kaufman, 1995). The principal must be a change agent willing to identify the inequitable situations in the school and then to formulate an effective plan to address the needs (Skrla, McKenzie, & Scheurich, 2009). School principal will need to provide the necessary leadership, from professional

development to technical support, to ensure success of technology instructional initiatives.

The reasons often cited for sub-par performance with technology include the elements commonly missing in most educational change efforts: inadequate staff development, lack of teacher preparation time, insufficient equipment, and a basic lack of an overall vision (McKenzie, 2000; Moersch, 1997). Obstacles to the integration of computers in instruction also include unsuitable curriculum and a lack of teacher knowledge of computer capabilities (Cakiroglu, Cagiltay, Cakiroglu, & Cagiltay, 2001). These issues, however, can be positively impacted by administrators so that the integration of technology will be successful in a school. In his book *Creating the Total Quality Effective School*, Lawrence W. Lezotte (1992) notes that professional development must be a priority for schools in order to bring about a change in student learning. He continues by noting that effective schools invest in the training of their staffs to insure a program of self-improvement for everyone that will ultimately impact the way the school does business (Lezotte, 1992). In the book *Developing and Documenting the Curriculum*, the author notes that planning for worthwhile professional development is a crucial step to integrating new “innovations” into the curriculum, one of which would be technology (Armstrong, 1989). One important component of the planning stage is to determine activities for individual teachers to meet the needs of their particular areas of growth (Armstrong, 1989). Armstrong (1989) suggests that training be provided based on the levels of use of the innovation, from what he terms as “non-use” on one end of the spectrum to “renewal “ at the other end. The Levels of

Technology Implementation (LoTI) framework seeks to measure teachers' levels of implementation of technology on a scale of Level 0 (nonuse) to Level 6 (refinement) in order to assist teachers and administrators in planning for appropriate staff development in technology (Moersch, 1995).

In planning for professional development, Armstrong (1989) also stresses that administrators and curriculum leaders should give teachers time to become familiar with a new innovation so that it can take root. Good and Brophy (2008) reiterate this idea in their book *Looking in Classrooms*. The authors explain that a professional development program should help meet the teachers' individual needs first (Good & Brophy, 2008). However, many school districts do not follow such a plan and spend little time planning for professional development (Good & Brophy, 2008). To attain a total quality school, there must be a commitment to the use of technology (Lezotte, 1992). However, professional development cannot be limited to simply teaching technology skills; it should also address teachers' understanding of instruction within the context of technology (Stein et al., 1999). Two priorities of the professional development are relevance to the teacher and evidence of transfer to the classroom setting (Shelly, 2000). Once the needs of the students and staff have been determined, the more focused the staff development group and the technology applications to be addressed, the more specific and relevant the training will be for the teacher (Shelly, 2000).

In addition, professional development for technology is more likely to impact instructional decisions if it is effective training. Effective training should involve a substantial amount of time on task over a sustained period of time, and it should involve

“hands-on” activities and collective participation of all teachers in the school (Mouza, 2009; Garet, Porter, Desimone, Birman, & Yoon, 2001; Schrum, 1999; Hoffman & Thompson, 2000). In fact, research indicates that training in technology differs greatly from traditional staff development in that many hours of training and experience are needed to see the adoption of new technology (Schrum, 1999). Results-based professional development will also include opportunities for practice with feedback, ongoing coaching, collaboration, and mentoring, as well as involvement in a variety of technology initiatives (Mouza, 2009; Lowe & Vespstad, 1999; Wolinsky, 1999). In addition, training should be flexible to include self-paced instruction, as well as small and large group sessions, so that teachers can choose the format and timing of training that best first their needs (Hoffman & Thompson, 2000; Coburn, 1999). Accountability is essential to understanding the effectiveness of training, and self-assessment surveys before and after training and a portfolio of teacher products that provides a record of progress can determine the effectiveness of training (Coburn, 1999; Wolinsky, 1999; McKenzie, 2000). Change in teaching practices more likely results when professional development connects teachers to their own content areas and increases their knowledge and skills, as well as offers compelling reasons to change or adapt current instructional practices (Garet et al., 2001; Schrum, 1999; McKenzie, 2000). Incentives can also encourage the effective integration of technology into instruction. These incentives can include credits for continuing education or university courses, release time, incentive pay, additional computer equipment, and recognition (Hoffman & Thompson, 2000).

Chapter Conclusion

The review of literature shows the most effective instructional practices for teaching writing to adolescents are peer assistance and process writing approaches (Graham & Perin, 2007). Also, technology provides improved opportunities for composing, revising, peer editing, and publication of writing since these devices can aid in the generation of ideas and then the organization of text, can provide feedback to assist with efficient revision and editing, and can create a community of networked writers, but a lack of computer accessibility results in a lack of computer facility, which results in writing that is more inferior in quality and less in quantity (Bruce & Levin, 2003; Moeller, 2002). Best practices in the teaching of writing that can still maintain successful student results on state-mandated assessments also include teaching students to write in a variety of genres, providing time for revising and editing, allowing students to write on their choice of topics, and encouraging creativity, all facets of the writing process and writing workshop (Higgins, Miller, & Wegmann, 2006).

Professional development for teachers also impacts their use of technology in their classrooms, and two priorities of the professional development are relevance to the teacher and evidence of transfer to the classroom setting (Shelly, 2000). A collaborative system for technology integration would involve teachers experienced with effective use of technology serving as mentors to their peers to model, teach, evaluate, and support technology integration in the school (Glazer, Hannafin, & Song, 2005).

Furthermore, the research shows that economically-disadvantaged students face a variety of challenges in learning to the level of peers from higher-income families, and

one of the variables impacting this is access to technology. (O’Kane, 2010; Reyes, 2006; Tajalli & Opheim, 2004; Hoffman & Novak, 1998). This lack of access can impact college admissions, college readiness, and workforce skills (O’Kane, 2010). A digital divide also exists based on age groups; however, this distinction will continue to grow irrelevant over time (Prensky, 2009).

Finally, the research shows the principal must be willing to identify the inequitable situations in the school and then to formulate an effective plan to address the needs (Skrla, McKenzie, & Scheurich, 2009). The reasons often cited for sub-par performance with technology include the elements commonly missing in most educational change efforts: inadequate staff development, lack of teacher preparation time, insufficient equipment, and a basic lack of an overall vision (McKenzie, 2000; Moersch, 1997).

CHAPTER III

METHODOLOGY

Introduction

The purpose of this chapter is to describe the research methodology implemented in this study exploring the implementation of technology to enhance curriculum development and instructional strategies in the teaching of writing in English classes in diverse, low-income high schools in Texas. The chapter includes three major sections: the research design of the study, a description of the population selected for participation, and the procedures followed throughout the research project.

Research Design

Dr. Chris Moersch first created the LoTI framework in 1994 to understand the integration of technology in the classroom (LoTI Digital-Age Framework, 2009). Today's instrument measures the classroom teachers' implementation of the NETS standards to promote higher-order thinking and problem-solving skills and is aligned with the Texas STaR Chart (LoTI Digital-Age Framework, 2009; Stoltzfus, 2006). Teacher responses to the statements on the LoTI framework are based on 8 levels of implementation from nonuse to refinement (LoTI), levels of instructional practices relating to a subject-matter versus learner-based curriculum approach known as Current Instructional Practices (CIP), and levels for assessing a teacher's comfort and skill level with using a personal computer identified as Personal Computer Use (PCU) that ultimately create a teacher's LoTI profile, which are detailed in Table 1. As teacher's

progress to higher profile levels, their curriculum and instruction would ideally reflect a move from a teacher-centered focus to a more learner-centered emphasis (Stoltzfus, 2006).

Table 1. Levels of Technology Implementation (LoTI) Profiles

<u>LoTI Profile</u>	<u>Curricular Descriptor</u>	<u>Instructional Focus</u>	<u>Technology Applications</u>
0	Non-use	teacher-directed and/or student-centered	not in use
1	Awareness	instruction provided to students; focus on lecture discussion; lower-level questioning	used by teacher to manage classroom or curriculum or to enhance presentation of material; used by students as a reward
2	Exploration	content understanding, mastery learning; direct instruction; ; lower-level questioning	used by students for enrichment, extension or for information gathering assignments and presenting work
3	Infusion	higher-order thinking and student engagement; in-depth analysis of content; student-generated products	use by students focuses on teacher-directed tasks that emphasize higher-order thinking skills
4a	Mechanical Integration	students explore real-world issues with technology, but teacher may be limited in full	inherent and embedded use by students to answer student-generated

Table 1. continued

LoTI Level	Curricular Descriptor	Instructional Focus	Technology Applications
		integration; pre-packaged materials and/or outside resources may assist teacher	questions
4b	Routine Integration	inquiry-based model	inherent and embedded use by students to answer student-generated questions
5	Expansion	learner-centered strategies that promote personal goal setting and collaborations outside the classroom	complexity and sophistication of use to answer student-generated questions and to collaborate with others
6	Refinement	learner-based curriculum; authentic problem solving with collaborations outside the classroom	seamless integration of technology and curriculum

Moersch granted permission in 2008 for the researcher to use his LoTI questionnaire to collect data for the dissertation study (see Appendix A). In 2005, the extensive validation study of the standard version of the LoTI questionnaire and the DETAILS version was conducted by Dr. Jill Stoltzfus at Temple University. Her work

revealed that each of the domains in the survey (LoTI levels, CIP, and PCU) achieved content validity and that strong internal consistency was achieved (The LoTI Connection, 2006, Validity and Reliability; Stoltzfus, 2006). Furthermore, the domains of the survey are strongly intercorrelated, rather than a representation of highly distinctive and strictly independent measures of technology implementation (Stoltzfus, 2006). In calculating specificity to determine the proportion of variance unique to each scale, Stoltzfus (2006) noted that while the survey has validity as a one-dimensional measure of teachers' levels of technology implementation, it also has validity in defining different categories of that implementation. In addition, the non-use LoTI level, as well as the focus of the survey to determine teachers' use of technology to develop complex, higher-order students learning projects, emerged as statistically reliable and empirically valid, (The LoTI Connection, 2006, Validity and Reliability; Stoltzfus, 2006).

In addition to determining the teachers' profiles with the LoTI questions (see Appendix B), the researcher added personal profile questions to the beginning of the questionnaire for this research. Teachers were asked to select a number band for their age and years of teaching experience. In addition, teachers were asked to identify their school for the purpose of determining the type of school (suburban, urban, or rural) and to note their highest degree earned. This additional data was used to determine a relationship between these factors and teacher implementation of technology in the classroom. Finally, at the end of the survey a section for open, typed comments was provided. Stoltzfus (2006) suggested that questions like these can help in understanding bias in a self-report format.

The study specifically focused on the integration of technology in writing instruction among 10th and 11th grade high school English teachers in diverse, low-income schools in Texas. Technology can be used in a variety of ways, from collaboration, networked class discussions, peer and self editing and revision, and publication, so follow-up interviews with 12 percent of the survey respondents were conducted to gather a thick description of the teachers' philosophies, experiences, and curriculum and instruction decision making. Questions focused on writing and technology beliefs and integration, as well as technology access and support, in the classroom and on the campus.

Research Population

Economically-disadvantaged students face many challenges in the public education system. Because of financial limitations, many of these students may only engage with computers at school, so how do teachers implement technology to enhance curriculum development and instructional strategies in the teaching of writing in their English classes for diverse, low-income students? To focus on students in poverty, schools for the survey were found using the TEA's comparable group data to compare schools with 70 percent or more students classified as economically disadvantaged and a student population of at least 500 or more students. A purposive sample was made to include urban, suburban, and rural schools across the state. The researcher requested that 10th and 11th grade English teachers complete the LoTI survey to provide a mix of writing instructors within a school.

Procedures

Ultimately, 40 schools in 21 districts across the state of Texas were selected as representatives of schools with more than 70 percent of the student population labeled as economically disadvantaged. School district superintendents were initially contacted with a letter (see Appendix C) detailing the survey scope and procedures, a copy of the LoTI questionnaire, and a postcard to return to the researcher indicating approval. Six school districts responded with approval. Follow-up to superintendents who did not respond was conducted via fax and email with the same original materials included as facsimile documents or email attachments. After this contact, three additional districts approved the research study, and two declined involvement. Seven districts requested additional information, required a conference with the researcher, and/or required the completion of documents for review by a committee in the district's research and accountability offices. Ultimately, six of these districts approved the research and one did not; three superintendents never responded to any of the repeated requests.

Most of the school districts did request that the school principal or department head be contacted for approval before teachers were contacted. These principals were contacted via fax, email, and mail with the same documents that the superintendents received. Twenty-one of the principals or department heads returned approval to the researcher, while ten of the principals never responded. This then left 15 schools that granted permission for the researcher to contact their teachers about survey participation.

The LoTI survey questions were transferred to an online survey completion system through [surveymonkey.com](https://www.surveymonkey.com) to increase ease of completion by teachers and to

mirror the technology practices of the research study. The survey was tested by the researcher's school faculty and edited based on their feedback. Once the survey was ready for use, the 10th and 11th grade teachers were then contacted via email (see Appendix D) with details about the research and survey that included a copy of the superintendent's or principal's approval and the IRB information sheet, along with instructions for anonymously completing the survey online via a link to surveymonkey.com. Follow up with teachers occurred repeatedly in order to increase the number of teacher respondents. Ultimately, 40 teachers representing 12 different districts across the state of Texas and 15 different high schools within those districts completed the survey in 2010. These schools included suburban and urban schools in major cities, rural schools along the Texas-Mexico border, and urban schools in coastal areas. Table 2 provides a detailed profile of each school from which teachers completed surveys, including the school results in 2010-2011 on the state-mandated TAKS test.

Table 2. School Profiles of Survey Respondents

School A	Rural school located at the Texas-Mexico border; 95 percent of students are Hispanic and 4 percent are white; 7 percent are LEP; 79 percent are economically disadvantaged; almost 2,000 students enrolled; 10 th and 11 th grade ELA TAKS scores are at or above state averages
School B	Urban school in a major city; 98 percent of students are Hispanic and one percent is white; 5 percent are LEP; 83 percent are economically

Table 2. School Profiles (continued)

	disadvantaged; almost 2,000 students enrolled; 10 th and 11 th grade ELA TAKS scores are at or above state averages
School C	Urban school in a major city; 86 percent of students are Hispanic, 9 percent are African American and 4 percent are white; 6.5 percent are LEP; 80 percent are economically disadvantaged; almost 2,000 students enrolled; 10 th and 11 th grade ELA TAKS scores are at state averages
School D	Urban school in a major city; 83 percent of students are Hispanic, 12 percent are African American and 2 percent are white; 10 percent are LEP; 87 percent are economically disadvantaged; 2,700 students enrolled; 10 th and 11 th grade ELA TAKS scores are at state averages
School E	Suburban school; 96 percent of students are Hispanic, and 2 percent are white; 11 percent are LEP; 77 percent are economically disadvantaged; almost 2,200 students enrolled; 10 th and 11 th grade ELA TAKS scores are below state averages
School F	Suburban school; 87 percent of students are Hispanic, 8 percent are African American, and 3 percent are white; 11 percent are LEP; 70 percent are economically disadvantaged; 2,300 students enrolled; 10 th and 11 th grade ELA TAKS scores are at or below state averages
School G	Suburban school; 90 percent of students are Hispanic, 5 percent are African American, and 3 percent are white; 12 percent are LEP; 77

Table 2. School Profiles (continued)

	percent are economically disadvantaged; 1,800 students enrolled; 10 th and 11 th grade ELA TAKS scores are at or slightly below state averages
School H	Urban school in a coastal city; 92 percent of students are Hispanic, 5 percent are African American, and 3 percent are white; 2 percent are LEP; 72 percent are economically disadvantaged; 1,800 students enrolled; 10 th and 11 th grade ELA TAKS scores are below state averages
School I	Urban school in a coastal city; 87 percent of students are Hispanic, 8 percent are African American, and 4 percent are white; 3 percent are LEP; 83 percent are economically disadvantaged; almost 1,000 students enrolled; 10 th and 11 th grade ELA TAKS scores are below state averages
School J	Rural school located at the Texas-Mexico border; 97 percent of students are Hispanic and 2 percent are white; 11 percent are LEP; 82 percent are economically disadvantaged; more than 3,000 students enrolled; 10 th and 11 th grade ELA TAKS scores are at or below state averages
School K	Suburban school; 98 percent of students are Hispanic; 8 percent are LEP; 88 percent are economically disadvantaged; more than 1,000 students enrolled; 10 th and 11 th grade ELA TAKS scores are below state averages
School L	Urban school located in a major city; 81 percent of students are Hispanic, 15 percent are African American, and 2 percent are white; 9 percent are LEP; 80 percent are economically disadvantaged; 2,200 students enrolled; 10 th and 11 th grade ELA TAKS scores are below state averages

Table 2. School Profiles (continued)

School M	Urban school located in a major city; 87 percent of students are Hispanic, 9 percent are African American, and 3 percent are white; 7 percent are LEP; 85 percent are economically disadvantaged; 2,500 students enrolled; 10 th and 11 th grade ELA TAKS scores are at or below state averages
School N	Urban school located in a major city; 84 percent of students are Hispanic, 6 percent are African American, and 6 percent are white; 7 percent are LEP; 82 percent are economically disadvantaged; 1,000 students enrolled; 10 th and 11 th grade ELA TAKS scores are slightly below state averages
School O	Suburban school; 63 percent of students are Hispanic, 24 are African American, and 8 percent are white; 20 percent are LEP; 83 percent are economically disadvantaged; more than 2,800 students enrolled; 10 th and 11 th grade ELA TAKS scores are below state averages

Analysis and interpretation of the survey data followed the principles described in *Educational Research: An Introduction* (Gall, Borg & Gall, 1996). The data collected from the survey instrument was compiled from a personal computer and analyzed using the LoTI scoring guide and calculation key to determine teacher profiles (LoTI profiles), based on their answers to the LoTI questions, their score for personal computer use (PCU), and their score for current instructional practices (CIP). These results were then analyzed with the profile questions regarding the teachers' age, teachers' years of

teaching experience, teachers' highest degree earned or the type of school using chi square and ANOVA to determine if statistical significance existed. Chi-square is a statistical test used to compare observed data with data expected to be obtained according to a specific hypothesis. The chi-square test is always testing the null hypothesis, which states that there is no significant difference between the expected and observed result. The purpose of analysis of variance (ANOVA) is to test for significant differences between means.

To determine writing teachers' perceptions of their self-reported concerns of technology integration and their possible solutions, follow-up interviews were conducted in 2010 and 2011 with 5 teachers, 12 percent of the survey respondents, to gather data for qualitative analysis. Since survey respondents included their school name with their survey response, emails were sent to the English teachers at these schools asking those who completed the survey to contact the researcher if interested in participating in an interview. Five teachers responded to the email agreeing to be interviewed. The interviews provided a supplement to the survey's quantitative data and an in-depth analysis of teachers' perceptions. Questions were crafted from a review of the literature, survey results, and the open-ended comments at the end of the survey and included a focus on writing pedagogy, as well as the use of technology in the classroom, and details on how this has changed over the teacher's career (see Appendix E). Interviews were conducted over the phone and were recorded. Information gathered through the interviews was unitized so that so that emergent categories or themes could be designated and hypotheses could be formed (Erlandson, Harris, Skipper, & Allen, 1993).

Trustworthiness is a key component of a qualitative study to guarantee credibility of the findings, to provide application of findings by the audience, and to allow the audience to check on the findings (Erlandson et al., 1993). To establish trustworthiness, the research included the qualitative analysis quality criteria of prolonged engagement, triangulation, peer debriefing, member checking, reflexive journaling, thick descriptions, purposive sampling, and an audit trail (Erlandson et al., 1993). Prolonged engagement enables the researcher to learn the culture of an organization over an extended time to avoid misrepresentations (Erlandson et al., 1993). For this study, prolonged engagement was established by reviewing AEIS data for each school for a three-year period to provide an understanding of the demographic details of the schools. Triangulation is the inclusion of multiple forms of data; this occurred when information gathered in the interview was compared to the school's profile of demographic data from the AEIS reports (Erlandson et al., 1993). Member checks allow the stakeholder groups to test categories and interpretations and conclusions; this is the most important in establishing credibility (Erlandson et al., 1993). Transcriptions of interviews were returned to the interviewees via email for member checks, and their feedback was used to revise the hypotheses. Peer debriefing allows for a peer professional outside the context of the study to review materials and listen to the ideas and concerns of the researcher (Erlandson et al., 1993). A district technology specialist in a district not associated with the study reviewed materials and listened to the researcher's ideas for peer debriefing. A reflexive journal provides the researcher with an opportunity to record information about the research process (Erlandson et al., 1993). During the interview process and the

unitizing of the data gathered in the interviews, the researcher completed reflexive journal entries about the research process and findings. Thick descriptions offer detailed information for the reader to understand the context of the findings (Erlandson et al., 1993). To describe common themes established in the opened-ended comments of the survey and the interviews, the researcher supports these ideas with quotations from the comments and interviewees to provide detailed context for understanding the data. Purposive sampling allows the researcher to seek both the typical and divergent data needed to increase the variety of information obtained (Erlandson et al., 1993). By contacting teachers who had completed the survey, purposive sampling was established. An audit trail provides dependability and credibility so that an auditor could determine trustworthiness of the findings (Erlandson et al., 1993). Recordings of interviews, notes, journals, and copies of reports provide an audit trail for the data analysis.

Chapter Conclusion

The primary focus of this study was an exploration of the implementation of technology to enhance curriculum development and instructional strategies in the teaching of writing in English classes in diverse, low-income high schools in Texas. These schools included suburban and urban schools in major cities, rural schools along the Texas-Mexico border, and urban schools in coastal areas. The 10th and 11th grade English teachers in these purposively-selected diverse, low-income schools in Texas with 70 percent or more students classified as economically disadvantaged were initially surveyed for quantitative data analysis. The survey examined levels of technology implementation in their classrooms, the teachers' current instructional practices, and

their personal computer use as they related to their levels of implementation, as well as the teachers' ages, years of teaching experience, and highest degrees earned. First, teachers' levels of technology implementation were measured using the LoTI questionnaire, and data was collected about the number of years of experience, highest degree held, and the age of the teachers in the survey. Second, a smaller number of teachers who volunteered were interviewed in-depth about their writing philosophy and practices, as well as their beliefs about technology and their practices with technology in the classroom.

CHAPTER IV

RESULTS AND DATA ANALYSIS

Introduction

The primary focus of this study was an exploration of the implementation of technology to enhance curriculum development and instructional strategies in the teaching of writing in English classes in diverse, low-income high schools in Texas. These schools included suburban and urban schools in major cities, rural schools along the Texas-Mexico border, and urban schools in coastal areas. The 10th and 11th grade English teachers in these purposively-selected diverse, low-income schools in Texas with 70 percent or more students classified as economically disadvantaged were initially surveyed for quantitative data analysis. The survey examined levels of technology implementation in their classrooms, the teachers' current instructional practices, and their personal computer use to determine their levels of implementation and included responses for the teachers' ages, years of teaching experience, and highest degrees earned. The following research questions were posed:

1. Is there a relationship between levels of technology implementation in the writing classrooms of diverse, low-income high school students in Texas and the teachers' age, teachers' years of teaching experience, teachers' highest degree earned or the type of school?
2. What are writing teachers' perceptions of their self-reported concerns of technology integration and their possible solutions?

The data gathered to answer these questions can prove beneficial to school educators as they prepare students not only for high-stakes testing, but also prepare them to be well-equipped learners, thinkers, and problem solvers, traits they will need for higher educational experiences and the work place.

Raw Data Overview

The 10th and 11th grade English teachers at the 21 school districts who approved the study were contacted via email with details about the research and survey that included a copy of their superintendent's or principal's approval and the IRB information sheet, along with instructions for anonymously completing the survey online via a link to [surveymonkey.com](https://www.surveymonkey.com) (see Appendix D). Ultimately, 40 teachers representing 12 different districts across the state of Texas and 15 different high schools within those districts completed the survey. Survey questions based on the LoTI framework measured the classroom teachers' implementation of the NETS standards to promote higher-order thinking and problem-solving skills. The International Society for Technology in Education (ISTE) established National Educational Technology Standards (NETS) for teachers to engage students and improve learning, to enrich professional practice, and to provide positive models of technology use (International Society for Technology in Education, 2008). In addition to the teacher standards, student standards have been developed with six performance indicators including communication and collaboration that specifies students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to

the learning of others, which relates directly to the English classroom (International Society for Technology in Education, 2007).

To ultimately create a teacher's LoTI profile, one of the 8 levels of implementation from nonuse to refinement (LoTI), a combination of their responses to questions regarding levels of technology implementation, instructional practices relating to a subject-matter versus learner-based curriculum approach known as Current Instructional Practices (CIP), and the comfort and skill level of the teacher regarding personal computer use identified as Personal Computer Use (PCU) was tallied.

In addition to determining the teachers' LoTI profiles, personal profile questions were added to the beginning of the questionnaire. Using number bands, teachers selected the band that applied to their age and number of years of teaching experience, as well as identified their highest degree earned and their school name, to determine a relationship between these factors and teacher implementation of technology in the classroom. Finally, at the end of the survey, a section for open, typed comments was provided. After surveys were completed, the teacher profile responses were reviewed. The results of the age ranges for the teachers are listed in Table 3. Table 4 provides the results for the numbers of years teaching experience, and Table 5 documents the highest degrees earned by the respondents. Table 6 describes the type of school for the survey respondents.

TABLE 3. Age Range Profile of Survey Respondents

<u>Age Range</u>	<u>Response Count</u>	<u>Response Percentage</u>
21-30	8	20
31-45	26	65
46+	6	15

TABLE 4. Number of Years Teaching Experience of Respondents

<u>Year Range</u>	<u>Response Count</u>	<u>Response Percentage</u>
0-5	10	25
6-15	16	40
16-25	14	35

TABLE 5. Highest Degree Earned by Respondents

<u>Degree Options</u>	<u>Response Count</u>	<u>Response Percentage</u>
Bachelor's degree	21	52.5
Some graduate courses to a Master's degree	16	40
Classes toward doctorate to a Doctoral degree	3	7.5

TABLE 6. Type of School of Respondents

School Type	Response Count	Response Percentage
Suburban	12	30
Urban	18	45
Rural	10	25

Of the 40 teachers surveyed, all but one had access to a computer at school, with access described on the survey as students and teachers can use computers within the school building for instructional purposes; this includes computers in the classroom, computer labs, computers on carts, general access computers in the library or something similar.

Using the LoTI Quick Scoring Guide, which combines scores to questions regarding levels of technology implementation, personal computer use, and current instructional practices, the data can be converted to a profile score on the LoTI scale. The results are listed in Table 7.

Table 7. LoTI Profiles of Survey Respondents

<u>LoTI Profile</u>	<u>Curricular Descriptor</u>	<u>Number of Respondents</u>	<u>Percentage</u>
0	Non-use	2	5.0
1	Awareness	4	10.0
2	Exploration	3	7.5
3	Infusion	13	32.5
4a	Mechanical Integration	6	15.0
4b	Routine Integration	3	7.5
5	Expansion	7	17.5
6	Refinement	2	5.0

Quantitative Analysis

For the purpose of the quantitative statistics in this study, the LoTI profile levels were combined with profile scores of 0, 1, and 2 serving as a low level of technology implementation, scores of 3, 4a, and 4b indicating a mid-level of implementation, and levels 5 and 6 indicating a high level of technology integration. Table 8 indicates these combined scores.

Table 8. Combined LoTI Profiles of Survey Respondents

<u>Level of Implementation</u>	<u>Number of Respondents</u>	<u>Percentage</u>
Low level	9	22.5
Mid level	22	55
High level	9	22.5

The chi square test for the variable of number of years teaching experience and combined LoTI levels is listed in Table 9, and Figure 1 displays the percentage of years of teaching experience and LoTI combined profile of high, mid, and low levels of technology implementation.

Table 9. Chi Square Test for LoTI Combined Profile and Years of Teaching Experience

Expected counts are printed below observed counts

	0-5 years	6-15 years	16-25 years	Total
Low level	1 2.50	6 3.75	3 3.75	10
Mid level	4 5.50	6 8.25	12 8.25	22
High level	5 2.00	3 3.00	0 3.00	8
Total	10	15	15	40

$$\text{Chi square} = 0.900 + 1.350 + 0.150 + 0.409 + 0.614 + 1.705 + 4.500 + 0.000 + 3.000 = 12.627$$

DF = 4, P-Value = 0.013

6 cells with expected counts less than 5.0

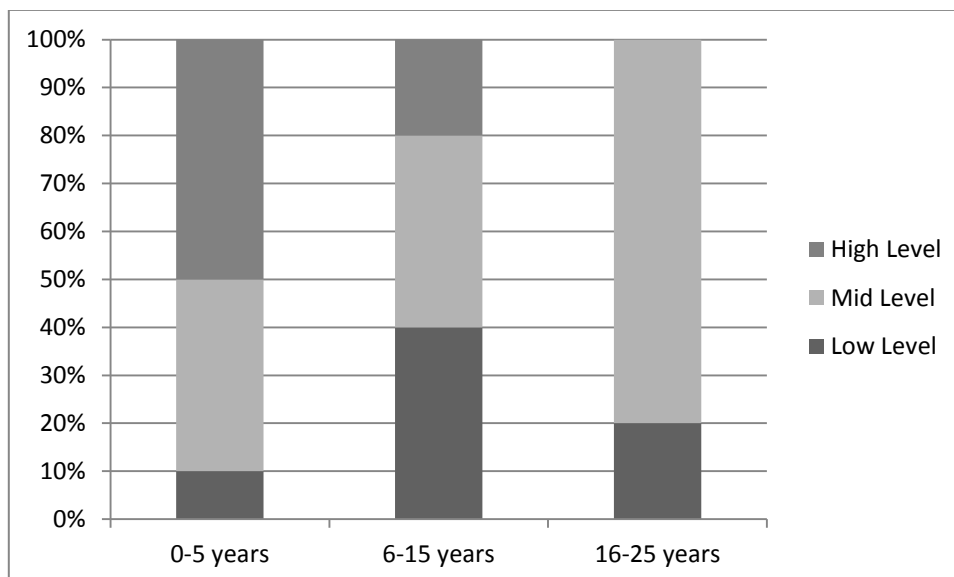


Figure 1. Percentage of years of teaching experience and LoTI combined profile

With a X^2 statistic of 12.627, the p-value is 0.0132. Due to the small p-value, there is strong evidence that a relationship exists between the number of years of teaching experience and the LoTI combined score. The two biggest contributors to this evidence are (1) observing several more less experienced teachers with high level of technology implementation and (2) observing several fewer than expected very experienced teachers with high LoTI scores.

The chi square test for the variable of age and combined LoTI levels is listed in Table 10, while Figure 2 displays the percentage for teacher age and LoTI combined profile of high, mid, and low level of technology implementation.

Table 10. Chi Square Test for LoTI Combined Profile and Teachers' Ages

Expected counts are printed below observed counts

	21-30 years old	31-45 years old	46+ years old	Total
Low level	1 2.25	9 6.25	0 1.50	10
Mid level	4 4.95	12 13.75	6 3.30	22
High level	4 1.80	4 5.00	0 1.20	8
Total	9	25	6	40

$$\text{Chi square} = 0.694 + 1.210 + 1.500 + 0.182 + 0.223 + 2.209 + 2.689 + 0.200 + 1.200 = 10.107$$

DF = 4, P-Value = 0.039

6 cells with expected counts less than 5.0

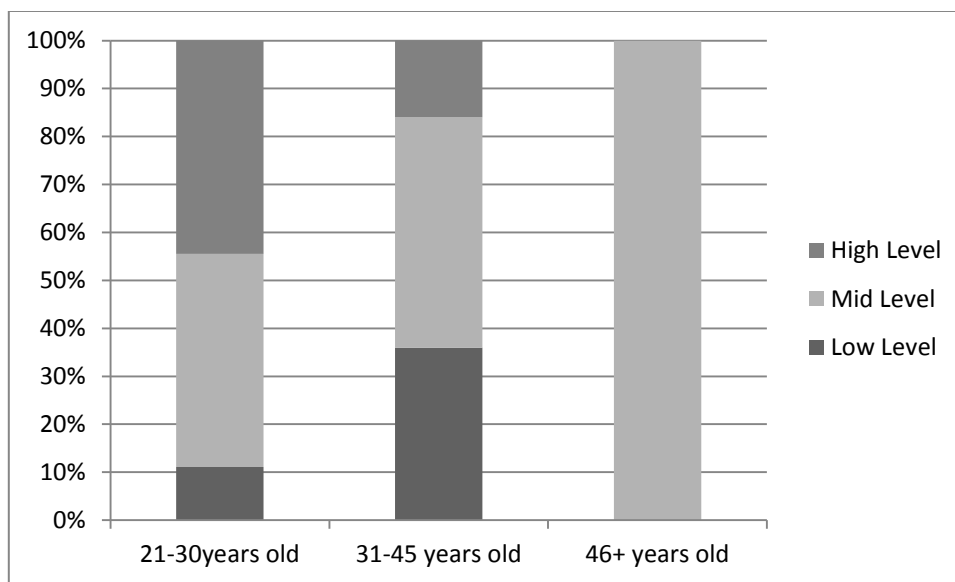


Figure 2. Percentage for teacher age and LoTI combined profile

With a X^2 test statistic of 10.107, a corresponding p-value of 0.039 is obtained, which provides strong evidence of a relationship between age and LoTI level of low, mid or high. Again, several more younger teachers are in the high level category than if there were no relationship between age and the LoTI combined score. The number of older teachers with mid-range scores was also almost twice what is expected. Generally, a teacher's age corresponds with the number of years teaching experience; similarly to the chi square test for teaching experience, a higher number of younger teachers are also in the higher level of technology implementation.

The chi square test for the variable of highest degree earned and combined LoTI levels is listed in Table 11. Figure 3 displays the percentage for highest degree earned and LoTI combined profile of the high, mid, and low levels of technology implementation.

Table 11. Chi Square Test for LoTI Combined Profile and Highest Degree Earned

Expected counts are printed below observed counts

	Bachelor's degree	Some graduate work to a master's degree	Doctoral courses to doctorate degree	Total
Low level	6 5.78	4 4.40	1 0.83	11
Mid level	11 11.02	9 8.40	1 1.57	21
High level	4 4.20	3 3.20	1 0.60	8
Total	21	16	3	40

$$\text{Chi square} = 0.009 + 0.036 + 0.037 + 0.000 + 0.043 + 0.210 + 0.010 + 0.013 + 0.267 = 0.624$$

DF = 4, P-Value = 0.960

2 cells with expected counts less than 1.0

6 cells with expected counts less than 5.0

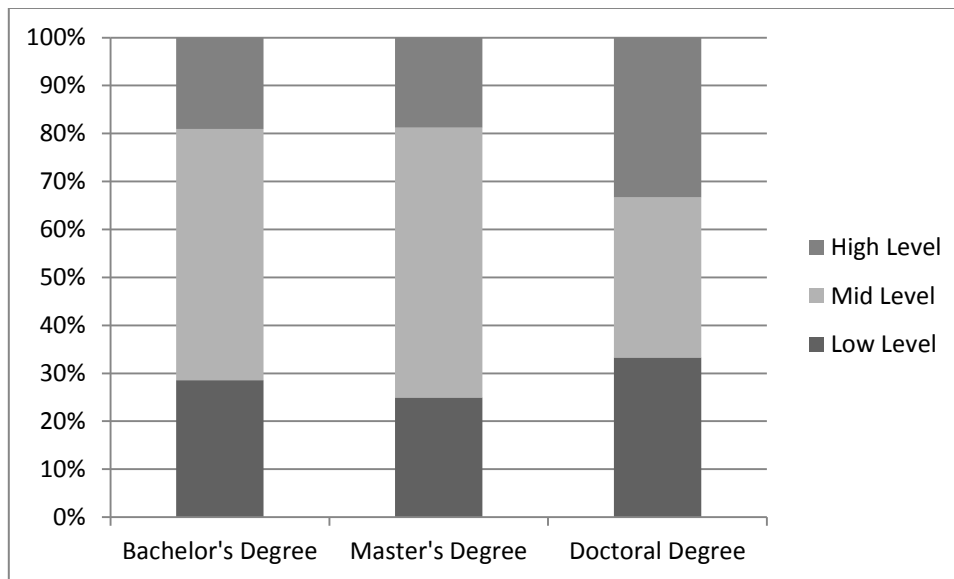


Figure 3. Percentage for highest degree earned and LoTI combined profile

With a X^2 test statistic of 0.624 and a p-value of 0.960, this provides almost no reason to suspect a relationship between degree earned and the LoTI combined score. Since two of the cells have suspected values less than 1, the test was revised a couple of times, combining some of the data. First, the test was run again with only two categories for degrees: bachelors and graduate work. Results are in table 12 with percentages displayed in Figure 4.

Table 12. Chi Square Test for LoTI Combined Profile and Combined Degree Earned

Expected counts are printed below observed counts

	Bachelor's degree only	Graduate school	Total
Low level	6 5.78	5 5.22	11
Mid level	11 11.02	10 9.98	21
High level	4 4.20	4 3.80	8
Total	21	19	40

$$\text{Chi square} = 0.009 + 0.010 + 0.000 + 0.000 + 0.010 + 0.011 = 0.039$$

DF = 2, P-Value = 0.981

2 cells with expected counts less than 5.0

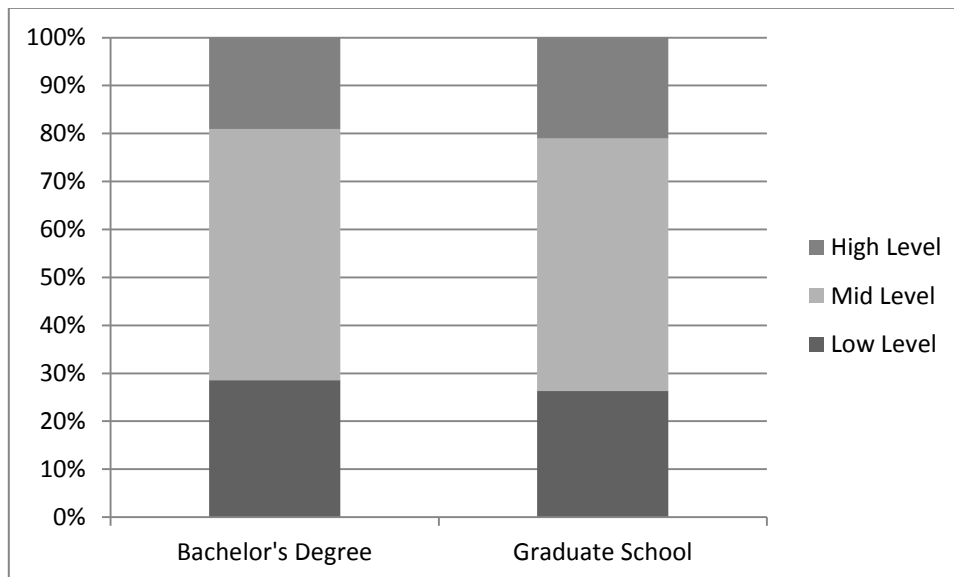


Figure 4. Percentage for combined degree earned and LoTI combined profile

This revised test still shows no significant evidence of a relationship between degree earned and a combined LoTI level.

The next set of data in Table 13 simply excludes those teachers with some doctoral work or a doctoral degree from the data. Figure 5 displays the percentages of this data.

Table 13. Chi Square Test for LoTI Combined Profile and Combined Degree Earned from Bachelor's Degree to Master's Degree

Expected counts are printed below observed counts

	Bachelor's degree	Graduate courses to Master's degree	Total
Low level	6 5.68	4 4.32	10
Mid level	11 11.35	9 8.65	20
High level	4 3.97	3 3.03	7
Total	21	16	37

$$\text{Chi square} = 0.019 + 0.024 + 0.011 + 0.014 + 0.000 + 0.000 = 0.068$$

DF = 2, P-Value = 0.966

3 cells with expected counts less than 5.0

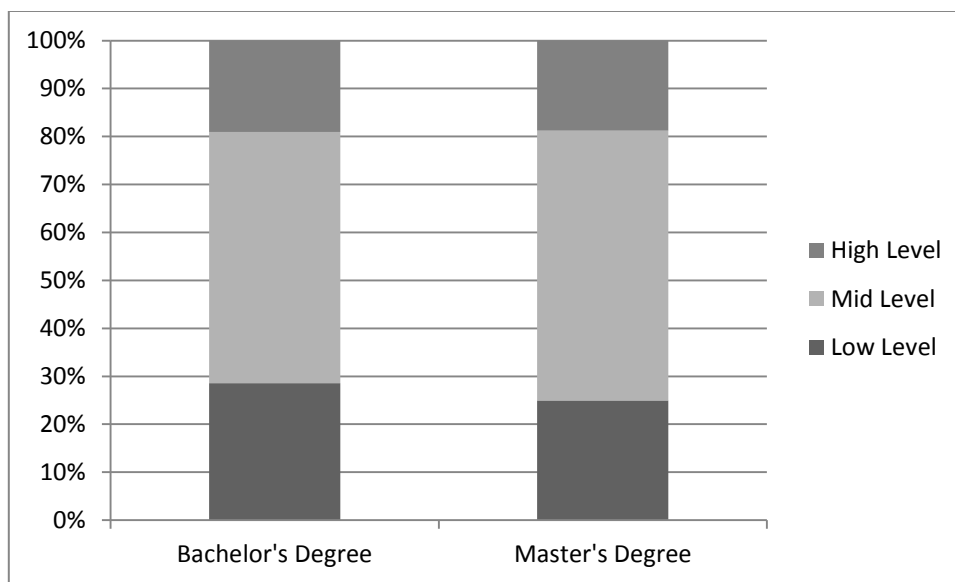


Figure 5. Percentage for combined degree earned from bachelor's degree to master's degree and LoTI combined profile

Again, the large p-value indicates there is little relationship between degree earned and combined LoTI level.

Finally, Table 14 shows data for school type and teacher combined LoTI levels, and Figure 6 displays the percentage for type of school and LoTI combined profile for the high, mid, and low levels of technology implementation.

Table 14. Chi Square Test for LoTI Combined Profile and Type of School

Expected counts are printed below observed counts

	Suburban	Urban	Rural	Total
Low level	5 3.00	3 4.50	2 2.50	10
Mid level	5 6.60	11 9.90	6 5.50	22
High level	2 2.40	4 3.60	2 2.00	8
Total	12	18	10	40

$$\begin{aligned} \text{Chi square} = & 1.333 + 0.500 + 0.100 + \\ & 0.388 + 0.122 + 0.045 + \\ & 0.067 + 0.044 + 0.000 = 2.600 \end{aligned}$$

DF = 4, P-Value = 0.627

6 cells with expected counts less than 5.0

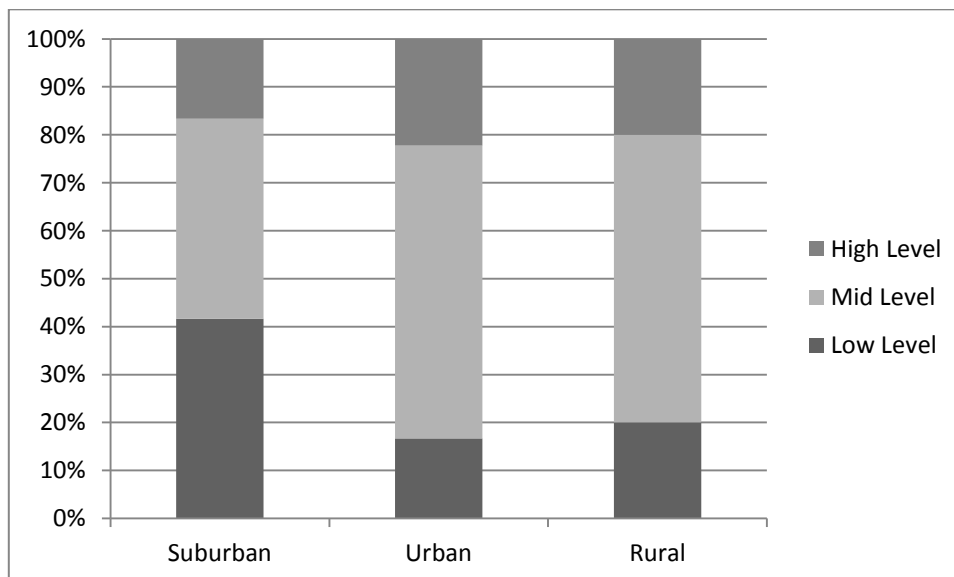


Figure 6. Percentage for type of school and LoTI combined profile

This test shows very little evidence of a relationship between type of school and teacher level of technology implementation.

Ultimately, the chi square tests show a possible relationship between teachers' combined LoTI level and their age and teachers' combined LoTI level and their number of years teaching experience; however, there is little evidence of a relationship between the LoTI score and degree earned or type of school of the survey respondents. All of these tests do have some limitations. Clearly, the beliefs would have greater validation from larger sample sizes. While all categories would benefit from a larger pool, there is a particular need for more teachers with a doctorate or doctoral coursework in the data in order to make reasonable conclusions about them. Also, future studies should strive to obtain a larger sample size from a broad group of teachers who well represents all teachers.

ANOVA was also determined. Results are listed in Table 15.

Table 15. ANOVA

Multiple linear regression results:

Dependent Variable: LoTI

Independent Variable(s): Suburban, Rural, Age, Experience, Degree

Parameter estimates:

Variable	Estimate	Std. Err.	Tstat	P-value
Intercept	4.7282743	1.6553866	2.856296	0.0073
Suburban	-0.04228019	0.6114607	-0.069146216	0.9453
Rural	0.0759367	0.73585594	0.10319506	0.9184
Age	-0.045694396	0.056144655	-0.813869	0.4214
Experience	-0.03185056	0.0631679	-0.5042207	0.6174
Degree	0.4383261	0.4973618	0.8813023	0.3843

In the output from ANOVA, the p-values for the variables are not significant.

Analysis of variance table for multiple regression model:

Source	DF	SS	MS	F-stat	P-value
Model	5	9.110222	1.8220444	0.7586851	0.5858
Error	34	81.65378	2.4015818		
Total	39	90.764			

Summary of fit:

Root MSE: 1.5497037

R-squared: 0.1004

R-squared (adjusted): -0.0319

In the ANOVA (analysis of variance) table, the p-value indicates that ANOVA is not showing anything significant.

Responses to the LoTI questions were analyzed using descriptive statistical practices. The mean, median, and mode were calculated for each of the 50 questions. Teachers responded to the questions by selecting a rank of on a scale of 1 to 7 to match the seven LoTI categories detailed in Table 1. The seven survey options were described as follows:

- 1 not true of me now
- 2 not true of me now
- 3 somewhat true of me now
- 4 somewhat true of me now
- 5 somewhat true of me now
- 6 very true of me now
- 7 very true of me now

The descriptive statistics of the questions are listed in Appendix F .

Based on the responses to the survey questions, 97 percent of the teachers reported they use technology resources daily for both personal and professional communication, for Internet access, and for planning classroom activities. Many also indicated a proficiency with basic software (76 percent) and a comfort with training others in using this basic software (50 percent), as well as an ability to solve most technical problems with their classroom technology resources (37 percent) and a confidence in managing a student-centered classroom of technology resources (70 percent). Since all but one teacher responded that he or she has access to a computer, teachers are using this technology in their classrooms, but the degree to which students are using it as well is not evident in these particular responses.

In addition, 45 percent of teachers responded that they frequently present information to their students using multimedia presentations to reinforce content and

better prepare students for standardized tests. However, 58 percent of teachers also responded that they use the classroom technology exclusively to not only present content to students, but also to take attendance, record grades, and email parents.

Teachers provided a mixed response on the professional development offered in their school district, with 24 percent indicating that current offerings do not meet their needs. Only 21 percent of teachers indicated that a focus of their classroom instruction is having students apply what they learn to the world they live in, and only 16 percent of teachers have students creating their own web pages or multi-media presentations in place of traditional reports. In addition, less than 5 percent of teachers indicated their students are able to use multiple technology resources, as well as human resources outside the school building, to solve school or community issues. Forty-five percent of the teachers believe their students also do not use classroom technology to improve their basic literacy skills via practice testing software, integrated learning systems, or tutorial programs, nor do they participate in online collaborative projects. Thirty-two percent of teachers noted that they frequently consider their students' interests, questions, and experiences and available resources outside of school, including technology, when planning student-centered learning activities; however, 32 percent of teachers find it is difficult to design units that take full advantage of classroom technology resources. Seventy-eight percent of teachers agree that their current instructional program is not effective without the use of technology. Ultimately, 42 percent of teachers cited that given their current curriculum demands and class size, it is much easier for their students

to learn about and use technology resources outside of their classroom, such as in a computer lab or resource center in the school.

Qualitative Analysis

The survey also provided the respondents with an opportunity to provide additional feedback on the survey topics. Eight of the 40 teachers provided comments online at the end of the survey, which are detailed in Appendix E.

After the online surveys were completed, the teachers at the participating schools were contacted via email requesting an interview with the researcher in order to determine writing teachers' perceptions of their self-reported concerns of technology integration and their possible solutions. Follow-up interviews via phone were conducted with 5 of the 40 teachers representing 4 different high schools using a set of interview questions related to the original survey (see Appendix G). The interviewees included Teacher A from a rural school with 10 years teaching experience and a master's degree, Teacher B from an urban technology magnet school with 15 years teaching experience, Teacher C from an urban technology magnet school with 18 years teaching experience, Teacher D from a suburban school with 15 years teaching experience, and Teacher E from a suburban school with 4 years teaching experience. The survey comments and interviews yielded three major themes: access to technology, technology proficiencies and professional development, and writing philosophy and pedagogical beliefs.

Theme 1: Access to Technology Resources

The first theme, access to technology, is defined by the researcher to include daily access in the classroom and in the school for both teachers and students, as well as

access for students at home. This includes access to hardware, software, and web resources. The online survey included an opportunity for teachers to respond with open comments. Eight of the 40 teachers included comments (see Appendix E) and all included statements related to this theme of limited availability of computers in their classrooms and in their schools. Respondent 1, a 36- to 40-year-old teacher from an urban school and with 11 to 15 years teaching experience, a bachelor's degree, and a LoTI profile score of 0, commented that "access to the computer labs at my school is very difficult." Similarly, respondent 2, a teacher with the same profile but from a suburban school and a LoTI profile of 1, noted that "there are only so many computer labs through the building/campus." Respondent 5, a 21- to 25-year-old teacher with 1 to 5 years teaching experience at an urban school, a bachelor's degree, and a LoTI profile of 4b, responded that although he or she is "very comfortable using technology, the resources are just not available in my school." The teacher further explained that he or she teaches "in an area where computers are not guaranteed to be available in every student's home, and we do not have computers in every classroom." Respondent 6, a 41- to 45-year-old teacher in a rural school with 16 to 20 years of teaching experience, a bachelor's degree, and a LoTI profile of 3, explained that the "school has over 3,000 students in it with only two computer labs." Respondent 7, a teacher 50 years or older with 21 to 25 years teaching experience, a master's degree, and LoTI profile of 4a, said that although the urban school "has computers available in the library and some 'labs,' many teachers have no computers for student use in their classroom." In addition, respondent 4 from an urban school, a 45- to 50-year-old teacher with 6 to 10 years of

teaching experience, some graduate school completed, and a LoTI profile of 3, commented that “it is difficult to plan the use of technology regardless of how personally comfortable you are with it if your students have little or no access.” The teacher further added that although the school has a tremendous amount of technology, it is “rarely available to the classroom teachers or even the students after hours.” Similarly, respondent 3, a 36- to 40-year-old teacher in a suburban school with 16 to 20 years of teaching experience, a master’s degree, and a LoTI profile of 4a, added that problems related to access to technology at school also included blocks and limits placed on teachers and students by the technology department. Respondent 8, a 36- to 40-year-old teacher in an urban school with 1 to 5 years teaching experience, classes toward a doctorate degree, and a LoTI profile of 5, explained that there are “some computers in the classroom, but they were ones I took out of our surplus pile and are slow, outdated, and are secretly rigged into our district’s network, so my ownership of them is clandestine.”

Since access was a focus of all of the survey open-ended comments, this theme was then investigated in the interviews. Echoing the results of the survey, these teachers also agreed access to technology is the most prominent barrier to technology implementation in a writing classroom. Four of the five teachers interviewed are limited to one computer in their classrooms, which they use for school-required tasks, such as attendance and gradebook records, as well as for power points for direct instruction to students. These teachers also had projectors and whiteboards connected to their computers, although Teacher A had a COW (Computer On Wheels) with 12 laptops in

her classroom for the year, but this served as her yearbook lab. However, she explained this was an advantage for her English students, as they had daily access to the laptops if they needed them, although there was not one laptop for each student in her class. She also said that her school had Nook reading tablets for the students in the reading club.

Aside from the classroom COW, student access during English class was available when teachers took their students to a lab, even at the technology magnet school, or when teachers brought a COW to their classroom. The availability of the computer labs differed at each school, and some of the teachers opted not to use class time for typing papers in a lab. Teacher A commented that her greatest challenge to using technology is availability due to cost, stating that “technology’s expensive, and our school, I think, has done an excellent job trying to get it into classrooms, but they just can’t afford to have it in every classroom. We have to share.” She added that she would like to have the Blackboard discussion program and clickers for recorded classroom responses to increase student participation; however, cost prevents the acquisition of these resources.

The school libraries also house computers for student use and are available before and after school and are accessible by students individually and can be reserved by teachers for class work. Despite one teacher using a blog sparingly for online class discussion, technology use by students in English was generally limited to computers for research, word processing, and power points. The technology magnet school, while offering technology classes to students, still had limited use of technology in the English classroom. Teacher C from this school commented that she doesn’t “think we’re keeping

pace with the demands” of technology, noting that kids who don’t have access to technology outside of school don’t get the exposure to it that they need.

In addition to access to technology resources, available tech support relates to access since equipment that is not working is therefore not accessible to students and staff. However, this wasn’t an issue for the 5 interviewees or more than 50 percent of the survey respondents. All of the interviewed teachers responded that tech support was consistently available, and teachers felt that responses to repairs were timely.

Theme 2: Technology Proficiencies and Professional Development

A second theme focused on technology proficiencies and professional development offerings in the district to increase knowledge and comfort with technology resources, which echoes responses on the survey. Professional development was provided in all districts but at different frequencies. Some teachers still had a need to learn more, but the youngest teacher (Teacher E) considered herself very proficient in technology. She explained that “being younger, we have so many technology classes in college, and I am able to pick up things quickly.” She added that her own proficiency was growing every year, and that from what she sees from other teachers and in other schools, she has a higher proficiency than other teachers. Although 75 percent of the teachers surveyed indicated a proficiency with technology, the older teachers in the interviews varied in their perception of their technology skills. Teacher D said she feels comfortable working with computers and has a class website and blog, and Teacher A considers herself proficient since, as the yearbook adviser, “she uses technology all the time.” She did say that there are others in her department who are even better. Teacher C

characterized herself as weak in technology skills but noted that she was better than other teachers in her school. Teacher B said her skills were not great and attributed it to her age, but she indicated she was willing to learn if provided with professional development sessions with hands-on instruction. She explained:

It's not helpful or feasible to sit there and watch somebody else do something. I don't get to do anything, and I'm supposed to come up with this magical amount of time where I'm supposed to be able to sit and play with this stuff and figure out what I want to use it for.

She added that her own lack of confidence and skills in using technology, in addition to time needed to train and then prepare, prevents her from integrating technology in ways that interest her.

In addition to considering how the training is delivered, teachers surveyed and those interviewed also want certain technology topics to be covered in professional development. Teacher A noted that there are technology skills she would like to learn but that training is not “as available as I would like it to be, but at the same time, we don't really have the resources for every teacher to be doing that [using technology in the classroom].”

Theme 3: Philosophies on Writing Instruction and Pedagogical Beliefs about Technology

The third theme, teachers' writing philosophies and pedagogical beliefs about technology integration, also impacted their decisions on whether or not they implemented technology in their classrooms. Several of the teachers have changed their

instructional philosophies about writing instruction over time, and this was often related both to their students' lack of interest in writing and the pressure to prepare students for the writing requirements on state-mandated assessments. Several mentioned a need to teach a format or formula for writing to prepare students for these exams. Teachers' greatest challenges in teaching writing varied but included time, lack of resources, lack of student motivation or interest, a focus on state assessments, and lack of student confidence.

Most of the five teachers interviewed believed that technology should be part of the classroom though teachers had varying ideas for how that would occur. Teacher A said that "as technology changes, it is just becoming more and more important." With the COW in her classroom, she said that she tries to get students to use technology as much as possible. Teacher A reiterated this attitude by explaining:

In the real world, whether they [students] go on to college or they go on to the work place, they will be using computers. They will be using technology. If you are in border patrol, if you want to be a police officer, my husband is a fire fighter, all of their reports are electronic. They have to know how to use a computer. Even if you work in a fast food restaurant, your menu orders that you take, they are all computerized. Computers and technology are part of our world, and we have to teach our kids how to use them.

She also wants her students to be comfortable with a computer, to be able to write an essay on the computer, and to use the Internet effectively by discerning good information from bad information. Similarly, Teacher E said her philosophy for using

technology in her classroom is that “we have to keep moving with the times. If the kids are moving with the times, I have to keep moving with the times.” She also mentioned that technology is important because it is used in the workplace. Although she is not as proficient or as comfortable with technology as she would like, Teacher C explained she does believe educators are doing a disservice to kids when technology is not included, especially for those students who don’t have access outside of school, noting “the public schools need to update their thinking to use technology as a model” for students to show them examples of real world experiences. She also explained that she works to update her own knowledge of technology outside of school to keep up with students.

In contrast, Teacher B said she really didn’t have any goals for technology integration and that she was not comfortable using the plagiarism service TurnItIn.com, although many of her colleagues were using it with their students. She added that she has “never looked at a blog. I don’t know the first thing about blogging” and that she would need more information to even begin to do that. However, she does require her students to type their papers, explaining that she has never accepted a hand-written essay, but she does not provide class time for typing. Though she knows most students don’t have computers at home, she expects students to use a library computer before or after school.

Specifically, some teachers allowed students to create individual or group projects with technology, from power points on the computer to video projects using camcorders. Teacher B allowed her students to read books on their phones if they had the capabilities. The use of technology that teachers seemed most excited or surprised about included projects that students created in groups, rather than assignments that

specifically required writing. However, Teacher E believed that the use of technology improved student writing and increased student achievement. She added that when students use technology, they “take more pride in their complete product” and they look more diligent when they are typing or researching on a computer. Echoing that idea, Teacher B said that she believes students are “more proud of a product that looks good” because it was created using technology rather than simply a poster with markers, and Teacher D added that her students are “usually much more excited to compose a paper on the computer than on paper. They seem more interested in research when they can find a source online rather than trying to locate and then copy information from a book.” In addition, she believes that the student writing is better because students will take time to revise on the computer in ways they would not if writing by hand. Likewise, Teacher A said that technology increases student interest, adding that writing on a computer is more fluid than writing long hand because students can edit and revise so easily. Consequently, she gives her students class time to type papers and conduct research. She believes that “technology is continuing to be important. You can’t teach English without technology. You have to teach them how to write on a computer. If they can’t use a computer, they can’t do anything.”

In contrast, the older teachers didn’t agree that technology improved writing, although one said it increased student pride in their products. Teacher C said that she didn’t think that access to technology could improve writing, explaining that students “either have the natural skills or went to better schools or had better teachers” if they produce good writing. In the survey comments, respondent 8, a 36- to 40-year-old

teacher in an urban school with 1 to 5 years teaching experience, classes toward a doctorate degree, and a LoTI profile of 5, explained that while the district has provided promethean interactive white boards in all the classrooms, this technology has not enhanced the curriculum. This teacher suggested that certain technologies may have more of an effect on writing and proposed that students would be better served with laptops for classroom and home use, e-books, and interactive lesson sites “that will actually prepare them for the modern world.” The teacher further added that “we are doing a disservice to our students, who are already digital natives, if we don’t provide daily delivery of content and skill building in the most current methods available.”

Chapter Conclusion

The quantitative statistical analysis indicates that teacher age and experience relate to a teacher’s level of technology integration, with younger and less experienced teachers often having higher levels of technology integration in their classrooms. The type of school where teachers teach and the degree they have earned does not, according to the chi square test, indicate a relationship with the teacher’s LoTI score.

Interviewed teachers had varying beliefs about how to approach the teaching of writing, but none of them indicated that their students followed a process of editing and revising.

Most mentioned that their writing philosophy focuses on a format to prepare students for state assessments. Although several of the teachers interviewed mentioned preparing students for the workplace, none of them mentioned a collaborative editing process as part of their writing philosophy.

Several of the teachers interviewed mentioned that they believed their students enjoyed their assignments more and took pride in their work when it was composed on the computer; however, access is limited to school labs or rolling carts of laptops. They also discussed the real-world applications of using technology in their English classrooms and the importance of instructing students in technology that is part of our lives outside of school; unfortunately, they do not have the resources to do this often or at all. Several of the interviewed teachers agreed that it is important to provide access to technology to their students, especially those without access at home. However, the survey indicates that one-fourth of the teachers have professional development needs in the area of technology for instruction.

CHAPTER V

SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

This chapter includes a summary of the study and the conclusions drawn from the data presented in Chapter IV. There are five sections in this chapter: a summary of the study, a presentation of the major findings, implications for further study, recommendations, and conclusions.

Summary

The primary focus of this study was an exploration of the implementation of technology to enhance curriculum development and instructional strategies in the teaching of writing in English classes in diverse, low-income high schools in Texas. These schools included suburban and urban schools in major cities, rural schools along the Texas-Mexico border, and urban schools in coastal areas. The 10th and 11th grade English teachers in these purposively-selected diverse, low-income schools in Texas with 70 percent or more students classified as economically disadvantaged will be initially surveyed for quantitative data analysis. The survey examined levels of technology implementation in their classrooms, the teachers' current instructional practices, and their personal computer use as they related to their levels of implementation, as well as the teachers' ages, years of teaching experience, and highest degrees earned. By reviewing the literature, evaluating the data collected from the

teachers in the survey, and examining the details provided in the teacher interviews, this study explored the use of technology to teach writing.

This study was designed to fill the gap in the research concerning the impact of using technology to teach writing to students in schools with a high economically-disadvantaged student population. The significance of such a study can be useful to school administrators when making budget decisions regarding technology for a school. The study can also help principals with decisions regarding professional development for teachers on the integration of technology to teach writing. In addition, administrators can use the study to help in decision making about how best to help students prepare for college and careers after high school.

The research questions for the study were used to determine a relationship between levels of technology implementation in the writing classrooms of diverse, low-income high school students in Texas and the teachers' age, teachers' years of teaching experience, teachers' highest degree earned or the type of school. In addition, research also focused on writing teachers' perceptions of their self-reported concerns of technology integration and their possible solutions. First, teachers' levels of technology implementation were measured, and data was collected about the number of years of experience, highest degree held, and the age of the teachers in the survey. Second, a smaller number of teachers were interviewed in-depth about their writing philosophy and practices, as well as their beliefs about technology and their practices with technology in the classroom. The data related to these issues was presented in Chapter IV.

The review of literature in Chapter II encompassed a variety of topics related to writing, technology, the education of economically-disadvantaged students, and the focus for high school instruction on college and career readiness skills. The study began with an explanation of various composition theories, from a process approach, to collaborative instruction, and a writing focus. Information on writing philosophies was only gathered from the teacher interviews.

The goal of the process pedagogy focuses on a classroom workshop setting that includes peer and teacher response to writing to develop a community of writers (Tobin, 2001). A meta-analysis to identify the most effective instructional practices for teaching writing to adolescents determined that peer assistance and process writing approaches were among the top interventions (Graham & Perin, 2007). Kessler (2005) found that students became more engaged in their writing when the publication aspect of the writing process, what she refers to as “composing for delivery,” allowed for writing that would be read by real audiences. This allows for an authentic consideration of audience and purposes and links the writing process to the product in order to prepare students for writing beyond the classroom (Kessler, 2005). Although some of the teachers interviewed required students to type their papers, most mentioned that their writing philosophy focuses on a format to prepare students for state assessments.

The collaborative pedagogy involves small group discussion on writing, students editing the work of their peers to make suggestions for improvement on a draft, and students working collaboratively on one piece of writing (Howard, 2001). Ivanic (2004) calls this theory a social practices discourse in which students write in real-life contexts

and with real purposes. This practice of writing is often recommended because it prepares students for writing in the work-place (Howard, 2001). Although several of the teachers interviewed mentioned preparing students for the workplace, none of them mentioned a collaborative editing process as part of their writing philosophy.

The National Writing Project (NWP), a professional network to assist teachers of writing, includes more than 200 sites sponsored by universities and colleges across the nation to lead summer institutes for teachers focused on the teaching of writing, to deliver professional development to schools on writing instruction, and to provide continual education and research opportunities for writing teachers (Kaplan, (2008). The core ideology of the NWP is that writing can be taught, rather than assigned to students, that writing is both an art and a craft, and that writing is a process approach that includes recursive steps of planning, drafting, revising, editing and publishing (Kaplan, 2008). Interviewed teachers had varying beliefs about how to approach the teaching of writing, but none of them indicated that their students followed a process of editing and revising.

The review of the literature also encompassed research on the integration of computers in writing instruction. Technology provides improved opportunities for composing, revising, peer editing, and publication of writing. Computers can aid in the generation of ideas and then the organization of text, can offer feedback to assist with efficient revision and editing, and can create a community of networked writers (Bruce & Levin, 2003). In addition, students who compose on the computer as opposed to using paper and pen are more aware of the recursive process of writing, are more able and willing to revise, and are better prepared for real world writing experiences (Moeller,

2002). Revision on the computer increases as students have an easier time completing the tasks than they would if they were required to rewrite an entire paper (Moeller, 2002). Furthermore, students who use computers for composing tend to write longer compositions, to produce text free of surface errors, and to revise more of their work as compared to their peers who composed with paper and pencil (Farnan & Dahl, 2003; Moeller, 2002; Nichols, 1996; Bangert-Downs, 1993). One of the interviewed teachers specifically mentioned that her students will revise their work on a computer rather than when it is handwritten.

Research also indicates that students also take more initiative and are willing to experiment and take risks, spend more time on assignments and more time on task, show more enthusiasm and positive attitudes toward writing, feel more empowered, and are more engaged with the text (Kajder, 2003; Moeller, 2002). Several of the teachers interviewed mentioned that they believed their students enjoyed their assignments more and took pride in their work when it was composed on the computer.

A lack of computer accessibility results in a lack of computer facility, which results in writing that is more inferior in quality and less in quantity (Moeller, 2002). Limited access to technology was reiterated in both the survey open-ended comments and in the teacher interviews. Cost of resources and district control of web sources are the two biggest factors limiting increased access to technology to students in their English classrooms. Although computers are in these schools, and one school is a technology magnet school, computers are not in English classrooms so that every

students has access on a daily basis. Access is limited to school labs or rolling carts of laptops.

Statewide instructional standards with a focus on college and career readiness skills and standardized testing has impacted the decisions teachers and administrators make about curriculum and instruction. Best practices in the teaching of writing that can still maintain successful student results on state-mandated assessments also include teaching students to write in a variety of genres, providing time for revising and editing, allowing students to write on their choice of topics, and encouraging creativity, all facets of the writing process and writing workshop (Higgins, Miller, & Wegmann, 2006). The highest test scores are often produced in the broadest and richest preparation in writing and with instruction that does not focus only on skills assessed on the state-mandated tests (Higgins et al., 2006). Effective writing instruction results in better writers, which leads to better test scores on writing tests (Higgins et al., 2006). However, teachers indicated in their interviews that these assessments have actually encouraged them to use a format or formula rather than increasing the range of writing opportunities.

The use of computers for practice sessions before the state writing tests increased motivation to write and increased the quantity of the writing in a study of fifth grade students (Daniels, 2004). These students also had increased test scores, particularly among African American students (Daniels, 2004). Although the use of computers enhanced the writing instruction, effective teaching practices and students' structural knowledge of the writing assessment were also key to success (Daniels, 2004). However,

most teachers in the survey indicated that their students do not use technology for these types of practice.

The U.S. Department of Education developed the National Education Technology Plan to encourage and promote technology-driven instructional changes (U.S. Department of Education, 2006, National Education Technology Plan). The plan motivates instructional leaders to provide creative and transformative changes in education so that students can benefit from the ever-changing information and communication technology. In addition, the Texas Education Agency Code expects that teachers will have professional development in technology, and their Long Range Plan for Educational Technology and the Texas Examination of Educator Standards framework require technology integration (TEA, 2007, Educational Technology: Long Range Plan for Technology, 2006-2020). However, the teachers' belief system about the learners in their school, as well as their ideas about what good teaching involves and what role technology plays in students' lives, will also impact the use of technology in the classroom (Windschitl & Sahl, 2002). Most of the interviewed teachers discussed the real-world applications of using technology in their English classrooms and the importance of instructing students in technology that is part of our lives outside of school.

Professional development for teachers also impacts their use of technology in their classrooms. Two priorities of the professional development are relevance to the teacher and evidence of transfer to the classroom setting (Shelly, 2000). Once the needs of the students and staff have been determined, the more focused the staff development

group and the technology applications to be addressed, the more specific and relevant the training will be for the teacher (Shelly, 2000). In addition, professional development for technology is more likely to impact instructional decisions if it is effective training. Effective training should involve a substantial amount of time on task over a sustained period of time, and it should involve “hands-on” activities and collective participation of all teachers in the school (Mouza, 2009; Garet, Porter, Desimone, Birman, & Yoon, 2001; Schrum, 1999; Hoffman & Thompson, 2000). In fact, research indicates that training in technology differs greatly from traditional staff development in that many hours of training and experience are needed to see the adoption of new technology (Schrum, 1999). The teacher who was most reluctant to incorporate technology into her classroom also specifically mentioned the desire for hands-on training and time to implement the new learning. Change in teaching practices more likely results when professional development connects teachers to their own content areas and increases their knowledge and skills, as well as offers compelling reasons to change or adapt current instructional practices (Garet et al., 2001; Schrum, 1999; McKenzie, 2000). This may be why this teacher hesitates to use technology and why others are using technology in limited ways.

A collaborative system for technology integration would involve teachers experienced with effective use of technology serving as mentors to their peers to model, teach, evaluate, and support technology integration in the school (Glazer, Hannafin, & Song, 2005). In addition, professional development built on the research regarding the best practices of teaching and sustained over time changed not only teacher knowledge

of educational technology and their beliefs about student learning with technology, but also teacher ability to design and then implement instruction supported with technology (Mouza, 2009). Almost one-fourth of the surveyed teachers do not feel that their district's technology training meets their needs.

Furthermore, the research shows that economically-disadvantaged students face a variety of challenges in learning to the level of peers from higher-income families. Research focused on closing the achievement gap between students of different ethnic groups consistently notes the connection between socioeconomic status and student achievement (Reyes, 2006; Tajalli & Opheim, 2004). One of the variables impacting this is access to technology. Socio-economic status and race are often among the factors that determine whether or not students have access to technology outside of school (O'Kane, 2010; Hoffman & Novak, 1998). Low-income students may face different challenges in attempting to use computers at home as compared to students from higher socioeconomic background who usually have increased financial resources and larger support networks and then increased accessibility to technology at home (Baek & Freehling, 2007). The achievement gap between students without access to technology at home and at school and students with that access impacts college admissions, college readiness, and workforce skills (O'Kane, 2010). Therefore, access to computers at school is critical to providing opportunities for low-income students to engage with technology (O'Kane, 2010). Several of the interviewed teachers agreed that it is important to provide access to technology to their students, especially those without access at home.

A digital divide also exists based on age groups. Prensky (2009) suggested that there exists a divide between young people who have been exposed to technology during most of their lives and adults whose technology use is often not as diverse, which may include the teacher. However, he concedes that this distinction will continue to grow irrelevant over time (Prensky, 2009). This study's quantitative analysis indicates a relationship exists between teachers' level of technology implementation, the LoTI combined profile, and teacher age and teaching experience. Of the 5 teachers interviewed, the most reluctant to integrate technology in her classroom was an older teacher with 15 years teaching experience. However, three other teachers, with 10, 15, and 18 years experience, indicated a willingness and interest in implementing it in their classrooms; they were prevented because of access to resources and training.

Closing the achievement gap and preparing all students for college and careers must be a focus of administrators, and the use of technology can be one factor in those efforts. Preparing students for college is a relatively new endeavor for secondary schools; however, the U.S. Secretary of Education Arnie Duncan emphasized in the foreword of the Executive Summary for the National Education Technology Plan that an educated populous is vital for the economic growth and prosperity of our nation, as well as for the successful continuation of our democracy (U.S. Department of Education, 2010, Executive Summary for the National Education Technology Plan).

A rigorous curriculum focused on college and career standards, common expectations for all students, whether college bound or not, and clear performance standards are the keys to preparing students for success after high school (ACT, 2011). Several of the

teachers mentioned that one of their goals with technology integration is providing real-world skills and applications.

Finally, the research shows the importance of the administrator as the instructional leader and change agent in the district or the school. The principal must be willing to identify the inequitable situations in the school and then to formulate an effective plan to address the needs (Skrla, McKenzie, & Scheurich, 2009).

The reasons often cited for sub-par performance with technology include the elements commonly missing in most educational change efforts: inadequate staff development, lack of teacher preparation time, insufficient equipment, and a basic lack of an overall vision (McKenzie, 2000; Moersch, 1997). Although this research study did not contact each school principal for an understanding of his or her vision, the other factors seem to be issues of concern in these schools based on the survey, survey comments, and teacher interviews.

If technology can have a positive impact on student success in writing and college and career readiness, including economically-disadvantaged students, and if technology integration is not only encouraged but required by government mandate, then administrators must be diligent in their approach to professional development in technology for their teaching staff, how much time they will devote to such training, and how much they will spend on the necessary technology equipment.

Chapter III highlights the methodology of the study. The review of the literature contributed to the selection of the LoTI framework, which measures the classroom teachers' implementation of the NETS standards to promote higher-order thinking and

problem-solving skills, as the basis for the survey of teachers. This framework provides the best match of survey material to the issues highlighted in the research, and it was modified slightly in format to create an online survey for teachers to anonymously complete with the addition of teacher profile questions related to teacher age, teaching experience, highest degree earned, and type of school. Since a disparity in achievement exists between students of various economic backgrounds, a focus on economically-disadvantaged students led to the selection of schools from across Texas with at least 70 percent or more of the students identified as low socio-economic. This selection included schools from suburban, urban, and rural areas across the state. In addition, the follow-up interview questions were drafted based on a review of the literature, the survey results, and the open-ended survey comments.

Forty high schools were originally selected to participate in the study. Of those, 15 schools were eventually represented by the 40 teachers who completed the online survey. The survey included 50 questions from the LoTI framework, as well as responses on teacher age, years of teaching experience, highest degree completed, and computer access at school. In order to verify that the identified schools were represented, teachers were also asked to indicate their school and district to determine the type of school (suburban, urban, or rural) and for use in contacting teachers for follow-up interviews. Teachers also were able to include comments in an open section at the end of the survey.

In order to secure participants for the interviews, emails were sent to the department head of each of the schools noted in the survey results, and this person was

then asked to forward the information to the teachers in his or her department. The information asked for teachers who had completed the survey to provide more evidence via interview. Five of the 40 teachers responded and offered detailed information about their philosophy of teaching writing, their experience in using technology in their instruction, and their access to technology in their classroom and school.

Discussion of Major Findings

The findings of this study are centered around the research questions that were presented at the beginning of the research. The first major finding focused on the first question: Is there a relationship between levels of technology implementation in the writing classrooms of diverse, low-income high school students in Texas and the teachers' age, teachers' years of teaching experience, teachers' highest degree earned or the type of school?

Using data collected from the survey of 40 teachers from 15 high schools across the state (see Table 6 in Chapter IV), 65 percent of the teachers are ages 31 to 45, while 20 percent are ages 21-30 (see Table 3 in Chapter IV). Forty percent of the teachers have taught 6 to 15 years, while 35 percent have taught 16-25 years, indicating that the majority of teachers surveyed are experienced teachers (see Table 4 in Chapter IV). More than half have only a bachelor's degree, while 40 percent have completed some graduate course or have earned a master's degree (see Table 5 in Chapter IV). These teachers represent a wide variety of ages, teaching experience, and educational backgrounds. In addition, data was compiled for the type of school represented by the

survey respondents with 45 percent being urban schools, 30 percent suburban, and 25 percent rural; this represents a wide variety of low-income schools across the state.

Using the responses to the survey, LoTI profiles were determined (see Table 1 in Chapter III). The majority of teacher profiles (32.5 percent) fall into the Infusion Profile, a mid-level use of technology where the instructional focus is higher-order thinking and student engagement, in-depth analysis of content, and student-generated products. The teachers' technology applications for this profile center on use by students that focus on teacher-directed tasks and that emphasize higher-order thinking skills (see Table 7 in Chapter IV). This seems to match the fact that a majority of teacher survey responses indicated a desire for student-centered instruction but that access to technology prevented that from happening in most schools, providing a gap between what teachers would like to do and what teachers are able to do. However, seven teachers (17.5 percent) fit the Expansion profile, a high level of technology integration. The instructional focus is learner-centered strategies that promote personal goal setting and collaborations outside the classroom. The technology applications for these teachers emphasize complexity and sophistication of technology use to answer student-generated questions and to collaborate with others. While 31 of the 40 survey respondents indicated they have limited access to technology, 9 of the respondents believe their schools are providing availability of technology to their teachers and students. Only 4 teachers or 10 percent were categorized in the Awareness profile, a low level of technology implementation where instruction provided to students centers on lecture discussion and lower-level questioning. Technology applications are used by teachers to

manage the classroom or curriculum, to enhance presentation of material, and to reward students.

Using the results of the LoTI survey and then combining the LoTI profiles into three categories to indicate low, mid, and high levels of implementation, chi square tests were performed to determine relationships between the levels and teachers' age, teachers' years of teaching experience, teachers' highest degree earned or the type of school. The chi square test between LoTI levels and years of teaching experience yielded a p-value of 0.0132. Due to the small p-value, there is strong evidence that a relationship between the number of years teaching experience and the LoTI combined score exists. The two biggest contributors to this evidence are (1) observing several more less-experienced teachers with high level of technology implementation and (2) observing several fewer than expected very experienced teachers with high LoTI scores. These results could be attributed to the training in teacher preparation courses with an assumption that those recently in college education programs have had instruction in courses that include ideas for the implementation of current technology in the classroom.

The chi square test for LoTI combined level and teacher age also resulted in a small p-value (0.039) providing strong indication of a relationship between these two variables. These chi square tests, though using different values, focused on similar teacher profile categories since age often positively correlates to number of years teaching experience. As a result, these two tests indicate that teacher age and experience could connect to a teacher's level of technology integration, with younger and less experienced teachers often having higher levels of technology integration in their

classrooms. This is not surprising considering how technology has changed in the last decade and supports the research about a digital divide between younger and older teachers (Prensky, 2009). Teachers in their 20s to 30s have grown up with technology more so than their older colleagues, and while today's technology is certainly different than what they experienced as high school students, it is not as different from today. Comfort with technology and a belief in technology's importance in the classroom, as well as instruction in how to incorporate technology in their courses, may be descriptors for younger teachers, which can increase a teacher's implementation of technology in the classroom.

The type of school where teachers teach and the degree they have earned does not, according to the chi square test, indicate a relationship with the teacher's LoTI score. The p-value for the chi square test for degree earned varied from 0.960 and then to 0.981 and 0.966 when degrees were separated into only two categories, bachelor's degree and graduate school, as well as a bachelor's degree and a master's degree. Similarly, the p-value for the test between the type of school and LoTI level resulted in 0.627, indicating little evidence that a relationship exists. While the schools represented suburban and urban schools in major cities, rural schools along the Texas-Mexico border, and urban schools in coastal areas, they are all diverse, low-income schools with similar demographics for their students (see Table 2 in Chapter III), resulting in less distinction than their locale type (suburban, urban, rural) would suggest.

A second major finding focused on the second question: What are writing teachers' perceptions of their self-reported concerns of technology integration and their

possible solutions? Conclusions were based on a review of responses on the survey, open comments at the end of the survey, and responses from the teacher interviews.

Limited access to technology, which is most often a result of lack of funding, will prevent even the best trained teacher from having opportunities for student use of technology. Teachers interviewed did not have a classroom set of computers but were required to take students to open access computer labs, which were often booked, or to reserve and then bring a COW (Computers On Wheels) to their classroom. Therefore, regardless of whether or not a teacher is proficient in the use of technology and can plan curriculum with a technology focus, if students do not have access or consistent availability to apply technology to their instruction, then the students are missing opportunities to enhance their learning and improve their writing skills. Furthermore, they are missing preparation for their professional lives after high school where technology integration is the expectation (U.S. Department of Education, 2006, National Education Technology Plan; TEA, 2007, Educational Technology: Long Range Plan for Technology, 2006-2020; Windschitl & Sahl, 2002).

In addition to a need for increased computer access, teachers mentioned an interest in other resources, like software programs and technical devices, which can enhance writing instruction. Administrative work to acquire grants could help in the funding of technology resources not currently available.

All the teachers who were interviewed mentioned that their school libraries provided access to computers before and after school. While this is not tied directly to the English classroom, students are often using these computers to complete English

writing assignments. Collaboration between English teachers and library staff could result in the development of opportunities and instruction to improve student writing skills through this individual use of computers.

Teachers' writing philosophies and pedagogical beliefs about technology integration impacted their decisions on whether or not they implemented technology in their classrooms. Several of the teachers have changed their instructional philosophies about writing instruction over time, and this was often related both to their students' lack of interest in writing and the pressure to prepare students for the writing on state-mandated assessments. They mentioned a need to teach a format or formula for writing responses on these exams. However, research indicates that best practices in writing instruction avoid formulas and focus on a process approach to writing so that revising and editing is an integrated part of the writing (Graham & Perin, 2007; Kessler, 2005; Ivanic, 2004; Howard, 2001; Tobin, 2001). Teachers did mention that students revised more when composing on the computer, but they didn't necessarily provide instruction on the revision of work or the class time to complete the task. Certainly, lack of access to computers prevents or reduces opportunities for students to complete this work at school, and for students from low-income families, completing this work at home with a computer might not be an option.

Teacher use of technology in the classroom seems more focused on presenting content and administrative tasks (email, attendance, grades) than on student engagement with technical resources. This is probably due not only to limited availability of classroom or campus technology resources, but also to the teachers' limited knowledge

of the resources, inadequate professional development offerings related to technology instructional integration, and decreased class time due to curriculum demands related to state assessments. Ultimately, these varied reasons frequently prevented teachers from using available technology, which has then limited student access to advanced and complete technology infrastructure. Although professional development was provided in all districts, most teachers still had a need to learn more. One teacher, who considered herself limited in her technology proficiency, specifically mentioned that she would prefer hands-on instruction, while the youngest teacher considered herself very proficient in technology because of her age and didn't feel she had training needs. These responses echo the research that professional development must be offered at different levels to meet the varying needs of the teachers. Also, technology training must be provided over time as an on-going process so that teachers can build on their skill set (Mouza, 2009; Garet, Porter, Desimone, Birman, & Yoon, 2001; Shelly, 2000; Schrum, 1999; Hoffman & Thompson, 2000).

Although most teachers believed that technology should be part of the classroom, they had varying ideas for how that would occur. Even if they believed that technology instruction prepares students for college and careers, they did not necessarily have the time or resources to provide this instruction during their English class time, which again emphasizes a gap between what teachers would like to do and what teachers are doing. In addition, student products in which technology was integrated often did not focus on writing. Rather, these assignments, whether group or individual, focused on creating more visual products, like videos or power points or photo collages. Since the research

points to the benefits of computer use to improve writing, teachers can benefit from training on how best to integrate technology into their instructional plans (Bruce & Levin, 2003; Farnan & Dahl, 2003; Moeller, 2002; Nichols, 1996; Bangert-Downs, 1993).

Implications for Further Study

This research study explored the relationship of the implementation of technology to teach writing to the teachers' age, years of teaching experience, highest degree earned, and type of school (suburban, urban, or rural). In addition, the survey also explored teachers' perceptions of their self-reported concerns of technology integration and their possible solutions. At the conclusion of this study, the researcher suggests the following for further study:

First, increasing the number of survey respondents and interviewees at the schools in the survey could yield richer results in regard to the statistical analysis to determine a relationship between LoTI level and teacher age, teaching experience, highest degree earned, and type of school (suburban, urban, or rural). Second, conducting observational research in the schools of respondents could offer more detail about teacher and student use of technology. Since the survey is a self-report, observations by the researcher would yield more consistent and less biased reports of each teacher's use of technology. The researcher could also interview principals to understand their point of view on budget constraints, achievement gaps, and professional development offerings. In addition, one of the schools in the survey was identified during the teacher interviews as a technology magnet school. It would be interesting to

focus research solely on several technology magnet schools to determine if teachers in a school with rich technology resources receive higher LoTI scores and how those scores correspond to teacher age, teaching experience, highest degree earned, and type of school (suburban, urban, or rural). Since access to technology was a recurring concern of teachers, even at the technology magnet school, research could be conducted at schools with few economically-disadvantaged students to determine if access to technology increases as the economic status of the students increases. In addition, LoTI profiles of the teachers in these schools could be compared to those at the diverse, low-income schools in this study, and relationships could be examined with regard to LoTI profile scores and to teacher age, teaching experience, highest degree earned, and type of school (suburban, urban, or rural). Furthermore, a study that includes these same schools but also includes student surveys could provide student perceptions about their interest, knowledge, and experience with technology, including their access to technology outside of school, as well as their views of writing in school and for statewide assessments. Research could also be conducted on the best practices for teaching writing and then could be linked to the practices of the surveyed teachers to determine how that also impacts writing. Finally, research could be expanded to high schools in other states with a continued focus on those schools with a high population of economically-disadvantaged students.

Recommendations

This study is significant in that it provides administrators with not only a review of previous research connected to this study's topic, but explores the relationship

between technology implementation in schools with 70 percent or more students identified as economically disadvantaged and teachers' age, teaching experience, highest degree earned, and type of school. Closing the gap in educational performance between the various demographic groups and preparing all students for college and careers is a concern of all principals and district administrators. Furthermore, budget constraints in public schools have forced districts to examine how every penny is spent. An understanding of the significance of technology and the current lack of access in many schools can help administrators weigh their financial allocations to technology or can increase their desire to find outside funding to support their technology needs. As a result, the researcher makes the following recommendations:

District and campus administrators must act as instructional leaders by first understanding the review of the literature on effective writing instruction and then sharing these philosophies with their teachers, providing professional development as needed on writing instruction. The literature indicates that effective writing instruction includes a process approach to writing, opportunities for class discussion and student collaboration, and publication of work. All of these can be more easily accomplished with technology resources that provide students with computer access for drafting and revising their work, online discussion forums, and web pages and blogs for publication of writing. Administrators should support their English teachers in adapting their curriculum to prepare students for state exams and for students' personal and professional pursuits after high school. This may include providing time for curriculum development and instructional lesson planning by a team of teachers, as well as

professional development for the English faculty, to help them prepare new instructional methods to reach all students, regardless of their ethnicity or economic status. Closing the current achievement gap and preparing students for higher education and the work force must be a goal for all educators.

In order to implement many of these instructional practices, teachers and students must have access to technology resources in their classrooms and schools in order to best prepare the students for both college and careers. Clearly, teachers feel frustrated by what technology, if any, is currently available to both teachers and students on a daily basis. Research indicates that the use of technology can improve student writing and that technology skills are necessary for success beyond high school. However, limited access to technology is often a result of funding constraints or a lack of understanding or appreciation for the benefit of technology integration by teachers and administrators. While funding for public schools continues to decrease and administrators are forced to cut budgets, they must understand the significance of technology to the curriculum and then find creative ways to provide funding for the technology resources their schools need. Grants or business partnerships can offer opportunities for funding that current state funding cannot provide. A sincere belief in the benefit of technology for the students and an understanding of its significance to prepare students for the world after high school will be needed to actively pursue these alternative financial avenues.

Effective professional development is always the responsibility of the campus principal and district administrators. This may be more important for technology resources that teachers may have no prior knowledge or experience using in a classroom

setting. This instruction must be varied to account for the different needs of the teachers, it must be sustained over time, and it must be collaborative. Teacher age and experience will vary on a campus and so will the staff's comfort and proficiency in technology. Therefore, a variety of professional development opportunities should be provided so that all teachers are receiving the instruction they need. In addition, providing one-time instruction does not emphasize the implementation of technology as an on-going process. By providing professional development over time, teachers will be able to address their current needs and build on their knowledge and experience. Finally, teachers need to work collaboratively to ensure they have a support network and a chance to share their innovative ideas with each other.

Conclusions

An achievement gap exists between students of various demographic groups. Closing this divide and preparing all students for success during and after high school is the responsibility of all campus and district administrators, as well as all teachers and the students themselves. What tools are needed to repair this gap? An understanding of the research on writing instruction and professional development in how to provide effective instruction of these practices is necessary. Technology resources and experiences that prepare students for college and career are also fundamental. Technology that will enhance the writing curriculum and that will provide opportunities for real-world applications will be vital. Professional development that provides variety, ongoing support, and teacher collaboration will be needed so that all teachers, regardless of age or experience, will have opportunities to improve their knowledge and comfort

with technology integration in their classrooms. Although technology has changed rapidly in the last ten years and availability to a variety of resources, from computer laptops to smart phones to eBooks and iPads, has increased, our current students, our future leaders, often have limited access, experience, and knowledge of these resources in an educational setting, if at all. Educators must understand the significance of implementing technology as a tool for learning, specifically for the practice of writing, and as a caveat for success in higher education and in the work place. Ultimately, our students must gain access to these technological resources in order to increase their communication skills, and thus, their educational opportunities and success during and after high school.

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APPENDIX A**PERMISSION TO USE LOTI SURVEY**

Dennee Saunders
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February 25, 2008

To: Texas A & M University
Dissertation Review Boards

Please accept this letter as notification that Dr. Christopher Moersch informed me that Courtney Haggard Wellmann will be using the LoTi Questionnaire to collect data for her doctoral dissertation study. Ms. Wellmann has the permission of Dr. Moersch and the NBEA to use the LoTi Questionnaire and the LoTi Framework for purposes of the study only. Ms. Wellmann also has permission to review all available results on the individuals taking place in her study.

For your reference, the LoTi Framework is posted at the LoTi Connection web site at:

<http://www.loticonnection.com/lotilevels.html>

Congratulations Courtney!

Sincerely,

A handwritten signature in cursive script that reads "Dennee Saunders".

Dennee Saunders
Assistant Director

APPENDIX B**SURVEY QUESTIONS BASED ON THE LOTI QUESTIONS**

1. Do you have computer access at school? Computer access means that students and teachers can use computers within the school building for instructional purposes; this includes computers in your classroom, computer labs, computers on carts, general access computers in the library or something similar.
2. Read the response and assign a score on the number scale of 0 to 7:
I frequently engage students in learning activities that require them to analyze information, think creatively, make predictions, and/or draw conclusions using classroom technology resources.
3. Read the response and assign a score on the number scale of 0 to 7:
I frequently present information to students using multimedia presentations or electronic "slideshows" to reinforce the content standards that I am teaching and better prepare students to take standardized tests.
4. Read the response and assign a score on the number scale of 0 to 7:
I have trouble managing a student-centered classroom using the available technology resources and would welcome the help of a peer coach or mentor.

5. Read the response and assign a score on the number scale of 0 to 7:

Students in my classroom design either web-based or multimedia presentations to showcase their research (e.g., information gathering) on topics that I assign in class.

6. Read the response and assign a score on the number scale of 0 to 7:

I frequently assign web-based projects to my students as a means of emphasizing specific complex thinking skill strategies aligned to the content standards.

7. Read the response and assign a score on the number scale of 0 to 7:

My students collaborate with me in setting both group and individual academic goals that provide opportunities for them to direct their own learning aligned to the content standards.

8. Read the response and assign a score on the number scale of 0 to 7:

Using the most current and complete technology available, I have maximized the use of the learning technologies in my classroom and at my school.

9. Read the response and assign a score on the number scale of 0 to 7:

Problem-based learning is common in my classroom because it allows students to use the classroom technology resources as a tool for higher-order thinking and personal inquiry.

10. Read the response and assign a score on the number scale of 0 to 7:

I use the classroom technology resources exclusively to take attendance, record grades, present content to students, and/or communicate with parents via email.

11. Read the response and assign a score on the number scale of 0 to 7:

My students identify important school/community issues or problems, then use multiple technology resources as well as human resources beyond the school building (e.g., partnerships with business professionals, community groups) to solve them.

12. Read the response and assign a score on the number scale of 0 to 7:

My students use the classroom technology resources most frequently to improve their basic math and literacy skills via practice testing software, integrated learning systems (ILS), or tutorial programs.

13. Read the response and assign a score on the number scale of 0 to 7:

Constant technical problems prevent me and/or my students from using the classroom technology resources during the instructional day.

14. Read the response and assign a score on the number scale of 0 to 7:

I am proficient with basic software applications such as word processing tools, internet browsers, spreadsheet programs, and multimedia presentations.

15. Read the response and assign a score on the number scale of 0 to 7:

My students frequently discover innovative ways to use our schools' advanced learning technologies to make a real difference in their lives, in their school, and in their community.

16. Read the response and assign a score on the number scale of 0 to 7:

I can solve most technical problems with our classroom's technology resources during the instructional day without calling for technical assistance.

17. Read the response and assign a score on the number scale of 0 to 7:

Locating quality software programs, websites, or CDs to supplement my curriculum and reinforce specific content standards is a priority of mine at this time.

18. Read the response and assign a score on the number scale of 0 to 7:

Though I may use technology for teacher preparation, I am not comfortable using my classroom technology resources as part of my instructional day.

19. Read the response and assign a score on the number scale of 0 to 7:

I am comfortable training others in using basic software applications, browsing/searching the Internet, and using specialized technologies unique to my grade level or content area.

20. Read the response and assign a score on the number scale of 0 to 7:

Computers and related technology resources in my classroom are not used during the instructional day, nor are there any plans to include them at this time.

21. Read the response and assign a score on the number scale of 0 to 7:

I consistently provide alternative assessment opportunities that encourage students to "showcase" their understanding of the content standards in nontraditional ways.

22. Read the response and assign a score on the number scale of 0 to 7:

My students use the Internet for (1) collaboration with others, (2) publishing, (3) communication, and (4) research to solve issues and problems of personal interest that address specific content standards.

23. Read the response and assign a score on the number scale of 0 to 7:

My students participate in online collaborative projects (not including email exchanges with other students, government agencies, or business professionals) to solve their self-selected problems or issues.

24. Read the response and assign a score on the number scale of 0 to 7:

Given my current curriculum demands and class size, it is much easier and more practical for my students to learn about and use computers and related technology resources outside my classroom (e.g. computer lab, etc.)

25. Read the response and assign a score on the number scale of 0 to 7:

I use the classroom technology resources most frequently to locate lesson plans I can use in class that are appropriate to my grade level and are aligned with our content standards.

26. Read the response and assign a score on the number scale of 0 to 7:

My current instructional program is effective without the use of technology; therefore, I have no current plans to change it to include any technology resources.

27. Read the response and assign a score on the number scale of 0 to 7:

I use technology resources daily to access the Internet, send email, and/or plan classroom activities.

28. Read the response and assign a score on the number scale of 0 to 7:

Due to time constraints and/or lack of experience, I prefer using instructional units recommended by my colleagues that emphasize complex thinking skills, students' technology use, content standards, and student relevancy to the real world.

29. Read the response and assign a score on the number scale of 0 to 7:

My students' creative thinking and authentic problem-solving opportunities are supported by the most advanced and complete technology infrastructure available.

30. Read the response and assign a score on the number scale of 0 to 7:

My personal professional development involves investigating and implementing the newest innovations in instructional design and learning technologies that take full advantage of my school's current and complete technology infrastructure.

31. Read the response and assign a score on the number scale of 0 to 7:

I can locate and implement instructional units that emphasize students using the classroom technology resources to solve "real-world" problems or issues, but I don't usually create them myself.

32. Read the response and assign a score on the number scale of 0 to 7:

I have an immediate need for some outside help with designing student-centered performance assessments using the available technology that involves students applying what they have learned to make a difference in their school/community.

33. Read the response and assign a score on the number scale of 0 to 7:

Students' use of information and inquiry skills to solve problems of personal relevance guides the types of instructional materials used in and out of my classroom.

34. Read the response and assign a score on the number scale of 0 to 7:

My instructional use of our classroom technology resources is frequently altered according to the latest innovations and research in the areas of instructional technology, teaching strategies, and/or learning theory.

35. Read the response and assign a score on the number scale of 0 to 7:

I regularly implement a student-centered approach to teaching that takes advantage of our classroom technology resources to engage students in their own learning.

36. Read the response and assign a score on the number scale of 0 to 7:

I frequently consider (1) my students' interests, experiences, and desire to solve relevant problems and (2) the available human resources outside of the school when planning student -centered learning activities that include technology.

37. Read the response and assign a score on the number scale of 0 to 7:

Students taking meaningful action at school or in the community relating to the content standards learned in the class is an essential part of my approach to using classroom technology resources.

38. Read the response and assign a score on the number scale of 0 to 7:

I have an immediate need for professional development opportunities that place greater emphasis on using my classroom technology resources with challenging and differentiated learning experiences rather than using specific software applications to support my current lesson plans.

39. Read the response and assign a score on the number scale of 0 to 7:

My students create their own web pages or multimedia presentations to showcase what they have learned in class rather than preparing traditional reports.

40. Read the response and assign a score on the number scale of 0 to 7:

The types of professional development offered through our school system does not satisfy my need for more engaging and relevant experiences for my students that take full advantage of both my "technology" expertise and personal interest in developing learner-based curriculum units.

41. Read the response and assign a score on the number scale of 0 to 7:

My students frequently use the classroom technology resources for research purposes that require them to investigate an issue/problem, think creatively, take a position, make decisions, and/or seek out a solution.

42. Read the response and assign a score on the number scale of 0 to 7:

Having students apply what they have learned in my classroom to the world they live in is a cornerstone to my approach to instruction and assessment.

43. Read the response and assign a score on the number scale of 0 to 7:

Curriculum demands, scheduling, and/or budget constraints at our school have prevented me from using any of the available technology resources during the instructional day.

44. Read the response and assign a score on the number scale of 0 to 7:

I am skilled in merging the classroom technology resources with relevant and challenging, student-directed learning experiences that address the content standards.

45. Read the response and assign a score on the number scale of 0 to 7:

Though I currently use a student-centered approach when creating instructional units, it is still difficult for me to design these units on my own to take full advantage of our classroom technology resources.

46. Read the response and assign a score on the number scale of 0 to 7:

My immediate professional development need is to learn how my students can use our classroom technology resources to achieve specific outcomes aligned to the content standards.

47. Read the response and assign a score on the number scale of 0 to 7:

It is easy for me to identify and implement software applications, peripherals, and web-based resources that support students' complex thinking skills and promote self-directed problem solving.

48. Read the response and assign a score on the number scale of 0 to 7:

My students have immediate access to all forms of the most advanced and complete technology infrastructure available that they use to pursue problem-solving opportunities surrounding issues of personal and/or social importance.

49. Read the response and assign a score on the number scale of 0 to 7:

I need access to more resources and/or training to begin using the available technology resources as part of my instructional day.

50. Read the response and assign a score on the number scale of 0 to 7:

I regularly use different technology resources for personal or professional communication and planning.

51. Read the response and assign a score on the number scale of 0 to 7:

Students' questions and previous experiences heavily influence the content that I teach as well as how I design learning activities for my students.

APPENDIX C

**LETTER TO DISTRICT OFFICIALS TO REQUEST APPROVAL TO
CONDUCT SURVEY IN DISTRICT**

4405 Longthorpe Ct.
College Station, Texas 77845

Date

Superintendent
District
Address
City, Texas Zip Code

Dear Superintendent:

I am following up on a survey request previously sent to your office for my dissertation at Texas A&M University. I am a high school English teacher researching the relationship between using technology to teach writing and student success on the TAKS ELA exit-level test. Teachers will be surveyed anonymously, and TAKS data for the schools involved will be compiled so that no school is noted individually. I am interested in surveying the 10th and 11th grade English teachers at the following high school:

I have included my letter from my committee chair detailing the study and the survey questions. Should you approve my contacting the teachers with the survey information, you can fax the included approval form.

I appreciate your help in my research efforts and hope that your teachers can also be involved in my study so that my results will be richer and more relevant. If you have further questions, please contact me by email at courtneyresearch@hotmail.com or by phone at 979-690-7662 or by fax at 979-693-0212.

Sincerely,

Courtney Wellmann
Doctoral Graduate Student and High School English Teacher
Educational Administration and Human Resource Development
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APPENDIX D

LETTER TO TEACHERS WITH SURVEY INSTRUCTIONS

I am a fellow English teacher completing research through Texas A&M University on the relationship between the implementation of technology in the teaching of writing and student success on the exit-level English Language Arts TAKS test. I value and need your input and hope you can help me by completing the anonymous survey online at the link listed below.

Your district's superintendent and/or principal have approved the distribution of this survey to the 10th and 11th grade English teachers at your school. I have also attached the information about research required by the Texas A&M University Internal Review Board (IRB). This form is required of all research at the university. You may review the information and then contact me via email or phone if you have questions.

To complete the anonymous survey for my dissertation research, click on this link or copy and paste the link into your browser to take you to the online survey:

http://www.surveymonkey.com/s.aspx?sm=6Rfy6H7j4puHXn5ZDYjLBg_3d_3d

I am also happy to share the results of the survey with you. You may contact me via email to request the results and they will be emailed to you when completed.

I know how busy English teachers are, so your time and support of this research study is appreciated. Completing the survey should take approximately 10 to 15 minutes. Thank you in advance. I can't complete this project without you.

Courtney Wellmann
Doctoral Graduate Student and High School English Teacher
Educational Administration and Human Resource Development
College of Education
Texas A&M University
979-690-7662
courtneyresearch@hotmail.com

APPENDIX E

COMMENTS ON SURVEY FROM SURVEY RESPONDENTS

<u>Respondent</u>	<u>Respondent profile and comments related to the survey topics</u>
1	<p>36- to 40-year-old teacher from an urban school and with 11 to 15 years teaching experience, a bachelor's degree, and a LoTI profile score of 0:</p> <p>Access to the computer labs at my school is very difficult. Some teachers have over 10 per classroom while others have none. At previous work locations students did prepare multimedia presentations for projects. Students had learned how to produce them in earlier grades</p>
2	<p>36- to 40-year-old teacher from an suburban school and with 11 to 15 years teaching experience, a bachelor's degree, and a LoTI profile score of 1:</p> <p>Many of these questions implied there is technology available for use by students in my classroom (ex. computer stations connected to the internet, a printer, etc.). Those items do not exist in my classroom, and there are only so many computer labs throughout the building/campus.</p>
3	<p>36- to 40-year-old teacher in a suburban school with 16 to 20 years of teaching experience, a master's degree, and a LoTI profile of 4a:</p> <p>Most of our problems exist due to the blocks and limits placed by our technology department. We cannot even troubleshoot, let alone search. We are blocked from access to everything.</p>

- 4 36- to 40-year-old teacher in a suburban school with 16 to 20 years of teaching experience, a master's degree, and a LoTI profile of 4a:
- Our school has a tremendous amount of technology, but it is rarely available for the classroom teachers or even the students after hours. The population we serve is technology poor when it comes to things like computers. Many do have access to cell phones but not much beyond that. It is difficult to plan the use of technology regardless of how personally comfortable you are with it if your students have little or no access.
- 5 21- to 25-year-old teacher with 1 to 5 years teaching experience at an urban school, a bachelor's degree, and a LoTI profile of 4b:
- I would be very comfortable using technology in my classroom and with my students, but the resources are just not available in my school. I teach in an area where computers are not guaranteed to be available to every students' home, and we do not have computers in every classroom, so assigning work to be completed with technology is not always possible
- 6 41- to 45-year-old teacher in a rural school with 16 to 20 years of teaching experience, a bachelor's degree, and a LoTI profile of 3:
- My school has over 3000 students in it with only two computer labs to support over 130 teachers in a school day!
- 7 50 years or older with 21 to 25 years teaching experience, a master's degree, and LoTI profile of 4a:

Just to clarify: although our school has computers available in the library and some "labs," many teachers have no computers for student use in their classroom. I have tried to answer the questions with this situation in mind.

8 36- to 40-year-old teacher in an urban school with 1 to 5 years teaching experience, classes toward a doctorate degree, and a LoTI profile of 5: We have promethean boards, which the district wrongly believes is the answer to all of our instructional/technology woes. However, as a fellow high school English teacher, that scenario doesn't always work. Our curriculum is novel-based, and we read our novels in class as they will otherwise be ignored. A lot of the materials on the promethean board are for smaller kids, and is nothing more than a high-tech chalkboard or occasional movie screen. I do have some computers in my classroom, but they were ones I took out of our surplus pile and are slow, outdated, and are secretly rigged into our district network, so my ownership of them is clandestine. My juniors and seniors would be best served, not with an overpriced promethean board, but with laptops to use in class/take home so that they can write papers, conduct research, learn software, and access (ideally) online resources, maybe even e-textbooks and interactive lesson-sites, that will actually prepare them for the modern world. I do my best to incorporate these things, though I have no support or adequate materials to do so. Though I am not an expert at hardware or troubleshooting, I am fairly comfortable using various software, databases, and the internet and don't have a problem sharing that knowledge when applicable. It should be noted that my technology-based lessons are in direct defiance of the district's curriculum, which is also deemed infallible and with a one-size-fits all approach. We are doing a disservice to our

students, who are already digital natives, if we don't provide daily delivery of content and skill building in the most current methods available.

APPENDIX F

DESCRIPTIVE STATISTICS FOR TEACHER PROFILE QUESTIONS

IN THE SURVEY

Item	Profile Question	Mean	Median	Mode
1	I frequently engage students in learning activities that require them to analyze information, think creatively, make predictions, and/or draw conclusions using classroom technology resources.	4.38	3.5	5
2	I frequently present information to students using multimedia presentations or electronic "slideshows" to reinforce the content standards that I am teaching and better prepare students to take standardized tests.	4.825	6	7
3	I have trouble managing a student-centered classroom using the available technology resources and would welcome the help of a peer coach or mentor.	2.3	2	1
4	Students in my classroom design either web-based or multimedia presentations to showcase their research (e.g., information gathering) on topics that I assign in class.	3.25	3	3
5	I frequently assign web-based projects to my students as a means of emphasizing specific complex thinking skill strategies aligned to the content standards.	2.575	3	3
6	My students collaborate with me in setting both group and individual academic goals that provide opportunities for them to direct their own learning aligned to the content standards.	3.67	4	3
7	Using the most current and complete technology available, I have maximized the use of the learning technologies in my classroom and at my school.	4.08	4	3
8	Problem-based learning is common in my classroom because it allows students to use the classroom technology resources as a tool for higher-order thinking and personal inquiry.	3.46	3	2
9	I use the classroom technology resources exclusively to take attendance, record grades, present content to students, and/or communicate with parents via email.	5.05	6	7
10	My students identify important school/community issues or problems, then use multiple technology resources as well as human resources beyond the school building (e.g., partnerships with business professionals, community groups) to solve them.	2.59	2	2

Item	Profile Question	Mean	Median	Mode
11	My students use the classroom technology resources most frequently to improve their basic math and literacy skills via testing software, integrated learning systems, or tutorial programs.	2.44	2	2
12	Constant technical problems prevent me and/or my students from using the classroom technology resources during the instructional day.	2.51	2	1
13	I am proficient with basic software applications such as word processing tools, internet browsers, spreadsheet programs, and multimedia presentations.	5.97	6.5	7
14	My students frequently discover innovative ways to use our schools' advanced learning technologies to make a real difference in their lives, in their school, and in their community.	3.13	3	3
15	I can solve most technical problems with our classroom's technology resources during the instructional day without calling for technical assistance.	4.77	5	5
16	Locating quality software programs, websites, or CDs to supplement my curriculum and reinforce specific content standards is a priority of mine at this time.	3.64	4	4
17	Though I may use technology for teacher preparation, I am not comfortable using my classroom technology resources as part of my instructional day.	1.79	1	1
18	I am comfortable training others in using basic software applications, browsing/searching the Internet, and using specialized technologies unique to my grade level or content area.	4.79	5	6
19	Computers and related technology resources in my classroom are not used during the instructional day, nor are there any plans to include them at this time.	1.57	1	1
20	I consistently provide alternative assessment opportunities that encourage students to "showcase" their understanding of the content standards in nontraditional ways.	3.97	4	3, 5
21	My students use the Internet for (1) collaboration with others, (2) publishing, (3) communication, and (4) research to solve issues and problems of personal interest that address specific content standards.	3.79	3	3
22	My students participate in online collaborative projects (not including email exchanges with other students, government agencies, or business professionals) to solve their self-selected problems or issues.	2.17	1	1
23	Given my current curriculum demands and class size, it is much easier and more practical for my students to learn about and use computers and related technology resources outside my classroom (e.g. computer lab, resource center).	4.64	5	5

Item	Profile Question	Mean	Median	Mode
24	I use the classroom technology resources most frequently to locate lesson plans I can use in class that are appropriate to my grade level and are aligned with our content standards.	3.76	4	2
25	My current instructional program is effective without the use of technology; therefore, I have no current plans to change it to include any technology resources.	1.69	1	1
26	I use technology resources daily to access the Internet, send email, and/or plan classroom activities.	6.74	7	7
27	Due to time constraints and/or lack of experience, I prefer using instructional units recommended by my colleagues that emphasize complex thinking skills, students technology use, content standards, and student relevancy to the real world.	2.69	2	1
28	My students' creative thinking and authentic problem-solving opportunities are supported by the most advanced and complete technology infrastructure available.	3.33	3	4
29	My personal professional development involves investigating and implementing the newest innovations in instructional design and learning technologies that take full advantage of my school's current and complete technology infrastructure.	3.61	4	3
30	I can locate and implement instructional units that emphasize students using the classroom technology resources to solve "real-world" problems or issues, but I don't usually create them myself.	3.15	3	3
31	I have an immediate need for some outside help with designing student-centered performance assessments using the available technology that involves students applying what they have learned to make a difference in their school/community.	3.23	3	3
32	Students' use of information and inquiry skills to solve problems of personal relevance guides the types of instructional materials used in and out of my classroom.	3.94	4	2, 4
33	My instructional use of our classroom technology resources is frequently altered according to the latest innovations and research in the areas of instructional technology, teaching strategies, and/or learning theory.	3.84	4	3
34	I regularly implement a student-centered approach to teaching that takes advantage of our classroom technology resources to engage students in their own learning.	4.03	4	3
35	I frequently consider (1) my students' interests, experiences, and desire to solve relevant problems and (2) the available human resources outside of the school when planning student-centered learning activities that include technology.	4.51	5	5

<u>Item</u>	<u>Profile Question</u>	<u>Mean</u>	<u>Median</u>	<u>Mode</u>
36	Students taking meaningful action at school or in the community relating to the content standards learned in the class is an essential part of my approach to using classroom technology resources.	3.41	4	4
37	I have an immediate need for professional development opportunities that place greater emphasis on using my classroom technology resources with challenging and differentiated learning experiences rather than using specific software applications to support my current lesson plans.	3.54	4	3, 4
38	My students create their own web pages or multimedia presentations to showcase what they have learned in class rather than preparing traditional reports.	2.49	2	1
39	The types of professional development offered through our school system does not satisfy my need for more engaging and relevant experiences for my students that take full advantage of both my "technology" expertise and personal interest in developing learner-based curriculum units.	3.5	3	1, 3
40	My students frequently use the classroom technology resources for research purposes that require them to investigate an issue/problem, think creatively, take a position, make decisions, and/or seek out a solution.	4.21	3	3
41	Having students apply what they have learned in my classroom to the world they live in is a cornerstone to my approach to instruction and assessment.	4.74	5	6, 7
42	Curriculum demands, scheduling, and/or budget constraints at our school have prevented me from using any of the available technology resources during the instructional day.	3.41	4	1
43	I am skilled in merging the classroom technology resources with relevant and challenging, student-directed learning experiences that address the content standards.	4	4	4
44	Though I currently use a student-centered approach when creating instructional units, it is still difficult for me to design these units on my own to take full advantage of our classroom technology resources.	3.56	4	3,4,5,6
45	My immediate professional development need is to learn how my students can use our classroom technology resources to achieve specific outcomes aligned to the content standards.	3.74	4	3
46	It is easy for me to identify and implement software applications, peripherals, and web-based resources that support students' complex thinking skills and promote self-directed problem solving.	3.51	3	3

<u>Item</u>	<u>Profile Question</u>	<u>Mean</u>	<u>Median</u>	<u>Mode</u>
47	My students have immediate access to all forms of the most advanced and complete technology infrastructure available that they use to pursue problem-solving opportunities surrounding issues of personal and/or social importance.	3.12	3	1, 3
48	I need access to more resources and/or training to begin using the available technology resources as part of my instructional day.	4.1	4	3
49	I regularly use different technology resources for personal or professional communication and planning.	5.37	6	6, 7
50	Students' questions and previous experiences heavily influence the content that I teach as well as how I design learning activities for my students.	5.37	6	5, 6, 7

APPENDIX G**INTERVIEW QUESTIONS FOR TEACHER INTERVIEWS**

1. What is your philosophy for teaching writing? Has this changed over your career? Why or why not?
2. How would you describe your proficiencies in technology?
3. What access to technology at school do you have?
4. What technology do you use?
5. Why do you use these?
6. What is your philosophy for the use of technology? Has this changed over time? Why or why not?
7. What are your goals for the integration of technology in your curriculum?
8. What access to technology do your students have at school?
9. What technology do your students use?
10. How do your students use technology in your class? Describe a scenario or give an example.
11. Why do you use these?
12. What is the student response or reaction to this technology? Describe a scenario or give an example.
13. How do you think this impacts student achievement in writing?
14. What technical support do you receive for technology?
15. What professional development for technology is provided?

16. What professional development do you still need?
17. What do you think is your greatest challenge in teaching writing?
18. How do you work to overcome this challenge?
19. What is your greatest challenge in integrating technology into your curriculum?
20. How do you work to overcome this challenge?
21. What has surprised you most about students' use of technology? Describe a scenario or give an example.
22. How many of your students have computer access at home? Why do you think that is the number? How does that impact your decision making about the integration of technology into your curriculum?
23. How much student collaboration occurs with technology? Describe a scenario or give an example.
24. How do students use technology to problem solve? Describe a scenario or give an example.
25. How do students use technology for creative purposes? Describe a scenario or give an example.
26. What would you like to do with technology that you are not currently doing? Why are you limited?
27. How would you characterize the use of technology by the other English teachers on your campus? Describe a scenario or give an example.
28. What is your school's budget for technology?
29. Do you think tech use is related to student achievement? Why or why not?

VITA

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